

Ministry of Education and Science of Ukraine
National University of Kyiv-Mohyla Academy
Faculty of Social Sciences and Social Technologies
School of Public Health

Master Thesis

Topic: «**Quality of dietary recommendations: to reduce obesity (Adolescents in Uyo and Kyiv as case-study) »**

Thesis is accepted by
(Head of the Department signature)

Submitted by

Second-year student: **Wisdom Edet Essien**
(Student name / signature)

Specialty 073 «Management»

Master Program «Management in Health Care»

Scientific Supervisor: **Professor Volodimir Kurpita**
(Name, scientific and academic degree / signature)

Reviewer

(Name, scientific and academic degree)

Master Thesis Defense Grade

«_____»

Examination Committee Secretary

«_20_» __June_ 2022.

Kyiv 2022

Abstract

Obesity is a common, serious, and costly disease. The main causes of the world obesity epidemic are well known: excessive fat and sugar intake, too much screen time, lack of sleep, insufficient physical activity. However, Diet intake has been a major factor in determining the obesity epidemic. We need world measures across all age groups to address these elements and we need them now. Consuming a healthy diet throughout the life-course helps to prevent malnutrition in all its forms as well as a range of noncommunicable diseases (NCDs) and conditions. Nevertheless, rapid urbanization, increased production of processed foods, and changing lifestyles have resulted to a shift in dietary patterns. Adolescents are now consuming more foods high in energy, fats, free sugars and salt/sodium, and many adolescents do not eat enough fruit, vegetables and other dietary fibre such as whole grains. The accurate make-up of a diversified, healthy and balanced diet will differ depending on individual characteristics (e.g., gender, age, degree of physical activity and lifestyle), locally available foods and dietary customs, cultural contexts. Nevertheless, the basic principles of what constitutes a healthy diet remain the same.

This research shows how adolescents in Uyo, Nigeria, and Kyiv, Ukraine have fallen shorts of the WHO recommendations on food in-take. Lack of education, parental influence, poverty, food availability and lack of time for homemade food were the major factors influencing food choices in these study regions. National governments have the primary responsibility of upholding Adolescents rights to nutrition. To achieve this, they need a strong and resilient systems that aid prevent all forms of malnutrition and deliver timely care and treatment when prevention falls short.

CONTENT

INTRODUCTION.....	5
CHAPTER 1. LITERATURE REVIEW.....	8
1.1. The Nutrition transition.....	8
1.2. Nutrition in Nigeria and Brazil.....	9
1.3. Nutrition in Ukraine.....	11
1.4. Improving adolescent nutrition behaviors.....	13
1.5. Health consequences of Obesity.....	14
1.6. Health care cost of Obesity.....	17
1.7. Impact of school breakfast programs.....	21
1.8. Influence of the physical environment.....	21
1.9. General strategies for obesity prevention.....	23
2.	
CHAPTER 2. METHODOLOGY.....	26
2.1. Preamble.....	26
2.2. Study Area	
2.3. Type of study	
2.4. Research design.....	25
2.5. Population of study.....	26
2.6. Sample size.....	26
2.7. Data collection.....	26
2.8. Procedure of study.....	27
2.9. Data analysis.....	27
2.10. limitations of study.....	27
3.	
CHAPTER 3. RESULTS OF STUDY.....	29
3.1. Introduction.....	29
3.2. Results obtained from the study.....	29
4.	
CHAPTER 4. DISCUSSION.....	36
4.1. Discussion and result evaluation.....	36
CONCLUSION.....	38

RECOMMENDATIONS.....	39
REFERENCES.....	41
APPENDIX.....	47

Introduction

According to the Behavioral Risk Factor Surveillance System [2020], there is a constant increase in overweight and obesity between the ages of 18 and 29. An unhealthy diet and a low level of physical activity during university years predispose students to future health issues.

Cerebral palsy (CP) is considered to be one of the leading causes of motor disability among adolescents and children (Mushta, S.M.; Khandaker, G.; Power, R.; Badawi, N, 2019). Malnutrition is described as an individual's energy and/or nutritional consumption being deficient, unbalanced, or excessive. Malnutrition has a wide definition that refers to two types of problem. First, underweight (low weight for age), wasting (low weight for height), stunting (low height for age), and micronutrient insufficiencies or deficiencies are some of the symptoms of undernutrition (a lack of important minerals and vitamins). Second, obesity, overweight and noncommunicable diseases linked to diet are the other two (such as stroke, cancer, heart disease, and diabetes). Malnutrition can be seen as a secondary health challenge that can have an impact on the overall well-being and health of children with CP and their families (Kuperminc, M.; Stevenson, R., 2008). It happens when food intake falls short of the requirements for the normal body functions, causing development and growth problems (Almuneef, A. et al, 2019). Malnutrition must be diagnosed, prevented, and managed in the early lives of children because development and growth depend on optimum nutritional intake. Malnutrition in children with chronic condition such as CP is caused by many factors, including the underlying disorder and also non-illness-related factors like increased caloric demands, altered nutrient use, malabsorption, and nutrient provision limits due to the fluid status and/or feeding tolerance (Larson-Nath, C. & Goday, P., 2019). In the factors of a healthy lifestyle, nutrition plays a vital role in the development of young adults (Li et al 2012). Eating habits patterns developed as young adults and adolescents influences the long-term behavior and have a massive impact on adult life (Long, et al 2013). During adolescent's academic years, they experiment greater freedom of choice regarding their food choices, health related behaviors, sports practicing, and also shaping their own lifestyle. Therefore, the transition to new living environment, with a busy schedule, unhealthy food offers, and the risk of skipping meals as well, is likely to change their eating behaviors with time (Alaimo, et al 2001). Weight is strongly associated to eating behaviors. Years spent in the university are very critical period for weight gain (Long, et al 2013). It was discovered that in general, students didn't eat the recommended ratios of vegetable and fruits, with a noticeable decrease in the quantity of vegetable and

bread consumed during the first year of university, and noticeable increases in alcohol consumption and fat intake. An excessive alcohol consumption and unhealthy diet contribute greatly to the energy intake and, therefore, can facilitate the student's weight gain. In a study by Racette et al. (2012), it was found that 50% of 764 freshmen students reported having eaten fast food or high-fat three or more times during the previous week. Nevertheless, the study also revealed that, by the end of their sophomore year, 70% of 290 students who were reassessed had gained weight with no apparent association with dietary patterns or exercise. Students have a notably higher total fat and saturated fat intake and much lower intake of monounsaturated fats, polyunsaturated fats, Vitamin E, folic acid, and grains compare to the instructions of American Heart Association (2020). Knowledge about the relevance of nutrition, healthy eating habits, and physical activity was found to be the keys to a healthy lifestyle of adolescents. The Medical students are supposed to exercise healthier eating habits compared to the nonmedical students; however, some studies have found contradictory results. Research by Ganasegeran et al. (2018) showed that medical students presented risk factors for early chronic disease because to their poor eating habits. Although medical students had sufficient knowledge of healthy eating habits, it was found that they failed to implement this knowledge.

The same findings were presented by Haq et al. (2019) and Williams et al. (2020), showed that medical students are more vulnerable to have a Western dietary pattern (processed food with low levels of salt, sugar, and fat) and to practice less physical activity. The Both research teams concluded that the medical students embraced less healthy dietary patterns compared to the healthy dietary patterns. Stress and sleep-related problems were also considered as the problem among medical students. Studies found that the medical students have more sleep-related problems compared to the non-medical students. For example, 70% of medical students in Hong Kong self-reported sleep deprivation (Belot, M., & James, J. 2020), 40.60% of students in Iran reported poor sleep quality, 28.2% of Brazilian medical students have insomnia, 69% of medical students in Lithuania reported good to excellent nocturnal sleep, 47.1% of Indian medical students reported refreshing sleep, 31.5% of medical students in Nepal suffered from sleep deprivation (Just & Wansink, 2020).

Palatty et al. (2017) and Tafoya et al. (2018) showed that the main reasons which discriminate medical students from their peers were attitude towards study, academic loads, and lifestyle. Programs for students to prevent unhealthy eating habits are necessary to counteract a growing spread of obesity and overweight later

in life. Although it has been observed that the students' food habits change over the years of education, the research has in general centered on physical education students or has been carried out on students in general. A very few studies have looked into healthy lifestyle and eating habits among medical students, specifically due to the fact that they are more informed about the relevance of a healthy diet, physical exercise, and also the negative effects of intake of various substances on mental and physical health (Brown, et al 2008). Of all the specialties, students in medical field should be the best-informed individuals and embrace a healthy lifestyle, which they can then promote in their professional careers. Due to the fact that studies carried out on medical students are very limited, and most of them evaluate the impact of nutrition education in the university curriculum on changing eating behavior, this study covers an essential gap.

Junk food is an unhealthy food that is high in calories from fat or sugar, with little dietary minerals, fiber, vitamins, protein, or other essential forms of nutritional value (O'Neill, 2006). It is also known as HFSS food (high in fat, sugar and salt) (Parks & Troy, 2016). Precise definitions vary by purpose and over time. Some of the high-protein foods, like meat prepared with saturated fat, can be considered junk food (Scott & Caitlin, 2018). Fast food and fast food restaurants are regularly related with junk food, even though fast foods cannot be categorically described as junk food. Most junk food is highly processed food. Threats about the negative health effects resulting from a junk food-heavy diet, specifically obesity, have resulted in the public health awareness campaigns, and also restrictions on advertising and sale in many countries. Junk food is a pejorative dating back at least to the 1950s (Zimmer & Ben, 2010). When there is intake of junk food very often, the excess fat, simple carbohydrates, and the processed sugar found in junk food assist to an increased risk of obesity, cardiovascular disease, and many other chronic health conditions (Roizman & Tracey, 2015). A case study on intake of fast foods in Ghana suggested a direct connection between obesity rates and consumption of junk food. The report asserts that obesity resulted in connected complex health concerns like an upsurge in the rate of heart attacks (Searcey et al, 2017). Studies have revealed that in the early age of 30, arteries could begin to clog and lay the groundwork for the future heart attacks. Consumers also tend to consume too much in one sitting, and those who have satisfied their appetite with junk food are very less likely to eat healthy foods like vegetable or fruit.

CHAPTER 1

LITERATURE REVIEW

1.1. The nutrition transitions

During the course of human existence, nutritional status and diet have undergone a sequence of stages, defined as broad patterns of beverage and food consumption and physical inactivity and activity and the subsequent shifts in the body composition and corresponding nutrition related disease. The concept of the nutrition transition centers on large changes in both activity and dietary patterns. The idea of the nutrition transition places human activity, diet, and body composition in a wide historical perspective, with emphasis on understanding the magnitude, pace, correlates, determinants, and results of dietary change across decades, centuries and millennia (Caballero & Popkin, 2002). It is essential to understand that food supply and agriculture critically affect global dietary patterns. Since World War II our agricultural system centered first and foremost on addressing global hunger and supply of basic starchy staples followed by animal source cash crops and food. This system has changed substantially in who controls the system but the focus on selected crops to the neglect of the others (e.g., legumes and vegetables), major cash crops such as palm oil and sugar cane and animal source food has not shifted as nutritional and health needs have changed drastically. Today understanding and then changing this agriculture system either indirectly or directly through an array of taxes and incentives is critical. Nevertheless, changing this system also faces complex economic, environmental, and political challenges, not least of which is the ability of the governments to implement change (Babu & Blom, 2014). The Governments have increasingly ceded control and funding of agriculture to the private sector. As a result, any attempt to embrace the food supply through direct government investments may be very little in contrast to changing the relative prices at the purchase level of food. Four sets of interrelated technological and macroeconomic factors have played significant roles in the world's shifting activity/inactivity and dietary patterns.

The first is technology in the widest sense, including the laborsaving equipment for economic work (e.g., robotics, reapers, mechanized assembly lines) and the home (e.g., mixers, microwaves), transportation options (e.g., the gas, wheel, engines, trains), and the leisure sedentary behavior-promoting devices (e.g., radio, television) (Popkin, 2006). Technology also includes food processing, production, and marketing systems.

The second is Urbanization. With the development of the early civilizations came denser living conditions and ultimately cities and villages (Mendez & Popkin, 2005). Urbanization has been going on for millennia but gained speed over the last century,

affecting the densities and sizes of cities globally. In History, urbanization has been connected with the access to a wider variety of food; greater food processing, and increased intake of food produced, processed, and cooked by others. Even in higher-income nations factors connected to residence determine suburban and urban food and labor markets and create clear dietary patterns. Among the responsible factors are improved marketing and transportation systems that make more availability of foodstuffs during periods of seasonal shortage; marketing activities of the commercial processed food sector and services that provide ready-to-eat food; more diversified populations with broad ranges of dietary habits; jobs that are not compatible with home food preparation, elder care, and child care; household structures that reflect wide-ranging social and economic conditions; and diseases and use of health care services. The last half of the twentieth century saw an uncommon demographic revolution that appears to be continuing unabated in the twenty-first century. Natural increase and migration have made urbanization a dominant factor affecting life in all the regions.

A third is the remarkable shift in income per capita and the general economic welfare relative to the cost of food. Globally the price of food in terms of hours of work per kilocalories has decreased steadily. As incomes have risen, the real prices of several types of food have fallen. Smaller quantity of incomes is expended on food, and individuals across the globe have access to a vast array of packaged beverages and foods. Food services and retailers have penetrated the markets where the majority of people purchase their food. At the same time households have the ways to purchase laborsaving equipment and devices that promotes sedentary behavior.

The fourth factor is the enormous expansion of global trade in services, providing access to modern manufacturing and technology. General Agreement on Trade and Tariffs (GATT) of World Trade Organization (WTO) has greatly expanded access to modern technologies and services (Popkin, 2006). Modern media, food services, retail food, and physical activity-related technologies are few of the sectors taking advantage of the opening of global trade in services and goods.

1.2. Nutrition in Nigeria and Brazil

Nigeria is a region that brings together a fusion of cuisine and culture as evidenced in the unique meats, spices, and ingredients. While many African countries' gastronomy culture was influenced by colonial Europe, Nigeria has their own food culture rich in agriculture, flavors, spices native to the land, and undeniable passion. Nigerian cuisine traditionally is made up of couscous, rice, chicken, potatoes, and grills which have been influenced by the English and Portuguese. However, due to the influence of Indian cuisine, Nigerian cuisine also consists of a

lot of hot spices and peppers. A regular breakfast, bean paste wrapped in leaf, in Nigeria dates back to the days of Portuguese mariners. It is believed that this delicacy was prepared for the mariners whom had spent a lengthy time at sea with little access to fresh vegetables. Nigeria is a region plentiful in vibrant colors and textures, vegetation and is abundant in variety. Preferred ingredients such as okra, peppers, black pepper, eggs, meat, soups, fish, plantain, and rice are utilized daily in some form or fashion. But it's the soups that are a staple in the world of Nigerian cuisine. Soups are in fact regularly the dishes passed on from generation to generation. Among them are ogbono soup, peanut soup, pepper soup, and owerri soup. In Nigeria, apart from over-nutrition and under-nutrition, which currently constitute a double burden of disease, hidden hunger constitutes also to a third burden (Akinyele, 2009). VAD (Vitamin A deficiency) and iron deficiency remain public health problems in Nigeria and this is specifically so in rural areas of the country. 25% of child, infant, and maternal mortality is attributed to vitamin A deficiency (Akinyele, 2009). Spread of vitamin A deficiency among children aged under 5 children in Nigeria is between 5.3% and 29.5%, depending on the region. Iron deficiency is the cause of frequent nutritional anaemia (iron deficiency anaemia) in Nigeria. 20 - 40% in adult females, 20 - 25% in children and 10% in adult males. Micronutrient deficiency high rates are an indication of low-quality diets, which contributes to all other forms of malnutrition (Lartey, 2018).

The micronutrient quality of poor diets could be improved with readily accessible and available traditional green leafy vegetables (TGLVs), specifically among populations who do not have adequate access to animal source foods for economic reasons (Icard-Vernière, Olive, & Picq, 2015). Traditional leafy vegetables are essential category in food-based approaches because, aside from fruits, they make up the major source of micronutrients in the diet, and could assist notably to lessen the burden of 'hidden hunger' (Flyman & Afolayan, 2006). Furthermore, they can be used to boost dietary quality and diversity to achieve sustainable healthy diets, which benefits everybody within the food system (Johns, 2003). In Nigeria, TGLVs are the well-known food group in the diet with great diversity across the various regions of the country. In the past they were eaten more regularly and diets of especially rural Nigerians contained considerable amounts of different green leafy vegetables (Ifon & Bassir, 1979). Recently, however, there has been a narrowing of the diversity of TGLVs consumed, reflected in the over dependence on a few, mostly cultivated green leafy vegetables species, which account for the number in individual's diets. Various traditional leafy vegetables are

being neglected, specifically the wild and uncultivated species, which many unfortunately are regarded as weeds (Grivetti & Ogle, 2000). They fall continually into disuse because to date they have not received adequate attention than cultivated ones. The indication is that the food basket from which micronutrients can be gotten gets smaller. Few of them, specifically wild and uncultivated TGLVs, become important during periods when cultivated regularly consumed vegetables are not in season and are not cheap in the markets; this specifically holds true for people in the rural communities (Ejoh & Samuel, 2016). Furthermore, uncultivated TGLVs normally compare well in terms of their micronutrient contents with more regularly cultivated and consumed vegetables. Research by Ejoh et al highlighted the nutritional importance of uncultivated TGLVs when compared with cultivated TGLVs; less utilized and uncultivated TGLVs were as nutrient-dense as the commonly and conventional consumed leafy vegetable species, especially in lutein and β -carotene. Given that TGLVs are part of the dietary structure of Nigerian local diets, it is essential to examine the consumption pattern, both to better understand the overall nutrient intake of vulnerable individuals and to ascertain the potential input they could make to the micronutrient requirements.

In Brazil, low income is the factor most frequently associated with the existence of malnutrition. Malnutrition in Brazil is more often seen among Brazilians with less than 2 minimum salaries/family, and who also live in the less developed parts of Brazil. In 1976, 59.2% of residents in the urban area earned 2 or less minimum salaries (Sanders, 1982). Research found that those residents in rural areas participated in agriculture on someone else's property or their own were better paid more than those who live from salaried labor alone; the temporary salaried workers are the largest rural class and have the lowest levels of nutrition in Brazil. In urban areas the informal sector signifies the lowest nutrition level group. The problem of food intake by the lower classes is linked to 4 aspects of Brazilian development: 1) distribution of income, 2) structure of food production, 3) the role of government food supplementation program and 4) government attempts to influence marketing and prices system. Brazil suffers today from unbalanced growth among its several economic regions and sectors, inadequate public services, and inequitable income distribution (Sanders, 1982). Misconception of the need of a large industrial base for development resulted in the neglect of the rural sector and thus higher malnutrition. Current regulatory efforts by government have begun to increase the rural production, but production of agricultural exports has increased at a more rapid pace than domestic food commodities. Small farmers have not taken advantage of new

financial opportunities offered by the government to balance production levels because: 1) the access to the small producers of food is difficult, 2) present hesitation to risk his few possessions, 3) banks do not have enough for the demand (Sanders, 1982). In Brazil, the richest classes receive the largest percentage of income and the economy is oriented to meet the demands of the more prosperous classes. The minimum support prices program of the government has not been successful in stabilizing prices yet it continues to feel that this policy is essential to increasing productivity. Other government programs like market intervention through COBAL, which the Brazilian Food Company designed to reduce consumer CEASA and costs, large wholesale markets, but these have not been fruitful (Sanders, 1982). The National Program of Nutrition and Feeding projects for poor families aim to provide 50% of protein and calorie needs and nutrition information; the beneficiaries there are about 2.5 million. However, the program's workers find it too ineffectual and limited. Other feeding programs have also met with little productivity. Brazil's nutrition problems cannot be solved until the government policy reflects the true need of the populations (Sanders, 1982).

1.3. Nutrition in Ukraine

It is estimated that over five million people have been affected and many infants, including children, have been killed since the beginning of the conflict in Ukraine. More than 1.4 million people are officially registered as internally displaced persons (IDPs). It is estimated that two million people, approximately, living along the conflict line are reliant on support, assistance and face persistent threats to healthy diet and insecurity. According to the available data (mostly 15 years old), pre-crisis stunting and acute rates of malnutrition were perceived to be low, while nationwide anaemia prevalence was 24.1% (MoH statistics, 2014), with substantial variations between oblasts. Vulnerable infant and young child feeding (IYCF) practices existed (MICS 2012), and there are widespread violations of the International Code of Marketing of Breastmilk Substitutes (the Code). With support from UNICEF in June 2015, an IYCF-E (Infant and Young Child Feeding in Emergencies) survey conducted by the Centers for Disease Control (CDC) never found any cases of severe acute malnutrition (as measured by MUAC) and the same survey found 0.5% moderate acute malnutrition in children and infant under two years of age. Developed in November 2014, the 2015 Strategic Response plan (SRP) had a very limited focus on nutrition. The only nutrition activity listed was “capacity building on food security and nutrition”. Nutrition was not considered a priority due to the lack of acute malnutrition. Based on gaps identified in the scoping mission, nutrition activities were expanded in the revised HRP (February 2015) to

include needs assessments, IYCF support, complementary food support to young children, capacity development (including training of healthcare workers on IYCF, orientation of partners on nutrition and best practice in IYCF), continued monitoring of at-risk groups (children under two, pregnant and lactating women and older people) and advocacy across sectors for a nutrition-sensitive response. Additionally, various assessments were planned/conducted and mechanisms for surveillance of older people and anemia were proposed.

Ukraine is on the right trajectory to meet two targets for maternal, infant and young child nutrition (MIYCN). No progress has been made towards achieving the target of reducing anemia among women of reproductive age, with 17.7% of women aged 15 to 49 years now affected. Meanwhile, there has also been no progress towards achieving the low-birth-weight target, with 5.6% of infants having a low weight at birth. There is insufficient data to assess the progress that Ukraine has made towards achieving the exclusive breastfeeding target; however, the latest prevalence data shows that 19.7% of infants aged 0 to 5 months are exclusively breastfed. Ukraine is 'on course' to meet the target for stunting, but 22.9% of children under 5 years of age are still affected, which is higher than the average for the Europe region (4.5%). There is insufficient data to assess the progress that Ukraine has made towards achieving the target for wasting; however, the latest prevalence data shows that 8.2% of children under 5 years of age are affected. The prevalence of overweight children under 5 years of age is 26.5% and Ukraine is 'on course' to prevent the figure from increasing. Ukraine has shown limited progress towards achieving the diet-related non-communicable disease (NCD) targets. The country has shown no progress towards achieving the target for obesity, with an estimated 27.5% of adult (aged 18 years and over) women and 24.5% of adult men living with obesity. Ukraine's obesity prevalence is higher than the regional average of 25.3% for women but is lower than the regional average of 24.9% for men. At the same time, diabetes is estimated to affect 7.7% of adult women and 8.5% of adult men.

1.4. Improving adolescent nutrition behaviors is an investment in adult health

Adolescents are in the process of establishing responsibility for their own diet and health-related behaviors. It is therefore an appropriate time for health promotion programs based on documented connections between behavior in this age group, cardiovascular, obesity, and other chronic disease risk factors. Adolescents can and should take the responsibility for their own nutrition and the long-term repercussions on health. This may be quite an issue, due to the fact that adolescents tend to be little concerned with the future (Greene 1986), and long-term consequences of their present behaviors (Cordonnier 1995), but important strategies exist, based on an

appropriate knowledge of environmental and personal determinants of food choice in this age group. Nutrition is just one aspect of health behaviors and the development of these in relation with chronic disease is better to be conceptualized in a 'chain of risk' framework (Kuh et al, 1997). Over the life course, there may be an accumulation of social and biological risk. For example, poor foetal nutrition (Barker et al, 1990), in combination with adverse or inadequate influence of peers, parents, and the educational experience in adolescence and childhood, sets the stage for chronic disease in adult life, with the additional risk coming from cultural lifestyles and influences. In other words, social patterning effects have to be considered after biological programming. Adolescence may be a particularly important time for social patterning influences. At least in a certain population group, another long-term benefit of an improved nutrition in adolescence, girls in particular, is reduced risk of osteoporosis in older age. Bone deposition and calcium intake in adolescence are important factors of bone mineral mass later in life, along with some other determinants. Influencing nutrition-related behaviors of young adults means that they have some choice and therefore, that they have the access to the required food resources. This may not be so as young adults generally have less resources than adults, while being mostly on their own than younger children. This is why interventions to enhance food security and economic of adolescents and more generally of households may be needed in order for nutrition intervention to have sustainable impact. Conversely, improved nutrition and health may positively affect productivity and, therefore, long-term food and economic security (Delisle 1998a).

1.5. Health consequences of obesity

Some of the co-morbidities connected to obesity and overweight include cancers (endometrial, cancers of breast, colorectal, ovarian, esophageal, pancreatic, prostate, kidney), Type 2 diabetes, stroke, hypertension, Congestive Heart failure, coronary artery disease, asthma, osteoarthritis, chronic back pain, gallbladder disease, pulmonary embolism, and also an increased risk of disability. Annually, all this leads to more than three million deaths worldwide (Guh DP, et al, 2009). There is also consistent relationship between obesity and overweight in adolescence and childhood with increased risk of both premature mortality and morbidity specifically cardio-metabolic morbidity (Reilly & Kelly, 2011). It is estimated that in the industrialized nations, disability due to obesity-related cardiovascular diseases will increase, under an increasing trend (Visscher & Seidell, 2001). The main reason being increased survival of these patients with cardiovascular diseases in these nations. Moreover because of insufficiency in insulin supply in these countries, disability due to obesity-related and type 2 diabetes will also increase due to

retinopathy, arteriosclerosis, and nephropathy (Visscher & Seidell, 2001). Yet another health-related problem due to increasing spread of obesity will be number of years that patients suffer from the obesity-related morbidity and the disability which would also increase notably (Visscher & Seidell, 2001). Researches have confirmed that obesity is a primary public health problem which leads to decreased life expectancy specifically in younger age groups (Finucane, et al, 2011). BMI itself, even without considering the other anthropometric measures (e.g., waist-to-hip ratio, waist circumferences), is a strong predictor for the overall mortality. This estimation involves both values, below and above the expected level of about 22.5–25 kg/m². Above this described range the progressive increase in mortality is primarily connected to cardiovascular disease. At the range of 30–35 kg/m², regularly, median survival is reduced by 2–4 years; but at 40–45 kg/m², it is reduced by 8–10 years. The expected increase in mortality below 22.5 kg/m² is not explained clearly (Flegal, et al, 2004). Obesity and overweight also carry a substantial health burden and will have a notable impact on health expenditures (Guh DP, et al, 2009). Obesity has a strong relation with the impairment of health-related quality of life, increasing the health care and medication spending, and occurrence of chronic medical problems. (Guh DP, et al, 2009) the related health care costs for obesity-connected problems, for both individuals and the health care systems, are substantial (Hayward & Colman, 2009).

The connection between obesity and mental health disorders is not clear (Scott, 2008). However, overweight is a stigma and obesity discrimination can lead to some mental disorders. Scientific prove emphasizes on an increasing risk of mood disorder, low self-esteem, eating problems, motivational disorders, interpersonal communication, impaired body image problems and all these directly or indirectly affect the quality of life (Scott, 2008). On the other hand, in some instances, experiencing the obesity inequality has lead to the issue of psychopathology and poor health behavior that via a vicious cycle, will enhance their bulimia, overeating, or other related problems (Scott, 2008). Some studies have showed that obesity in both women and men increase the risk of a very poor sexual health (Hilbert, 2010). Individuals that are obese, attribute this to their weight and their appearance, and encounter regular difficulties in their sexual activities (Hilbert, 2010). Sexual health outcomes and sexual activity such as unintended pregnancy, sexual satisfaction, and abortion have been mentioned as important issues (Hilbert, 2010). Sexual quality of life is specifically impaired for women with obesity and who are faced also with complexity of the therapeutic procedures (Hilbert, 2010). As such we need to highlight on more extensive population-based researches to find out the impact of obesity and overweight on different aspects of mental health including

communication problems, mood disorders, self-satisfaction and its effects on the sexual health besides different aspects of quality of life (Hilbert, 2010).

The Consequences of obesity-related physical co-morbidity includes stigmatization and psychological impairments experienced by obese patients (Scott, 2008). Overweight stigma and attributable discrimination are documented in all the key areas of living, including development and growth, employment structure, educational process, and provision of health care (Rosengren & Lissner, 2008). Obese individuals are most often ridiculed by their physicians, teachers, and the public. At times they also suffer from ridicule, discrimination, rejection, social bias, and humiliation (Scott, 2008). Even specific obesity therapeutic or diagnostic procedure like related anthropometric assessments could possibly affect the professional attitude of their care givers and subsequent clinical evaluation and clinical service provision for obese individuals when they are seeking care (Rosengren & Lissner, 2008). Discrimination related to weight, by itself is connected to poor health behavior like pathological overeating, binge eating or even sedentary life and decreased physical activity that as a result leads to greater weight gain. This harsh cycle, again solidifies the risk of exposure to weight-related discrimination (Rosengren & Lissner, 2008).

Studies on consequences of obesity on spiritual health are very limited. Exploratory evaluation on the connection between spiritual well-being and emotional eating showed that, specifically in women, the lower levels of spiritual well-being is corresponded with higher levels of emotional eating. There are some evidences that, emotional eating assists to impaired nutritional behaviors such as binge eating, higher caloric intake, and bulimic eating desires. Some other studies have emphasized on the essential role of education which leads to better spiritual perception (Hawks, Goudy & Gast, 2003).

In 2010, more than one-third of U.S. adolescents and children were obese or overweight (Centers for Disease Control, 2013), and nearly 20 percent of Minnesota's 9th and 12th grade students were obese (Minnesota Department of Health, 2012). In addition to obesity, children also encounter limited access to food, or food insecurity due to an absence of resources or money. In 2012, 10% of U.S. households with children faced food insecurity (Coleman Jensen, Nord, & Singh, 2013). In Minnesota, 10% of households are classified as food insecure, and it is estimated that 1 in 6 Minnesota children are at risk of hunger (Second Harvest Heartland, 2013). Recent studies have demonstrated that nutrition affects students' health, behavior, thinking skills, and all factors that impact academic performance. Research recommends that diets high in saturated and trans fats can negatively

impact memory and learning, nutritional deficiencies early in life can affect the cognitive progress of school-aged children, and the access to nutrition improves students' concentration, energy levels, and cognition. One study found that 5th grade students with less nutritious diets performed very badly on a standardized literary assessment (Florence, Veugelers & Asbridge, 2008). Another study found that 5th grade students who ate more fast food were worse on reading scores and math (Li & O'Connell, 2012). Similarly, research that examined a healthy eating campaign that introduced healthier, freshly prepared school meals, and banned junk food from school, found that participating students scored higher on science and English tests than students who did not take part in the campaign (Belot & James, 2009). Nutrition also indirectly impacts school performance.

Poor nutrition can leave students susceptible to illness or lead to stomachaches and headaches, resulting in school absences (Brown, Beardslee, & Prothrow-Stith, 2008). Access to nutrition that incorporates glucose, protein, and carbohydrates has been shown to improve students' concentration, cognition, and energy levels (Bellisle, 2004; Sorhaindo & Feinstein, 2006). In contrast, nutritional deficiencies (particularly Vitamin B, zinc, protein, and Omega-3 fatty acids) early in life can have an affect on the cognitive development of school aged children (Sorhaindo & Feinstein, 2006). Also, studies suggest that diets high in saturated and trans fats can negatively impact the brain, influencing memory and learning (Gómez-Pinilla, 2008). Finally, study has also established a link between behavior and nutrition. Studies have found that access to nutrition, particularly breakfast, can enhance a student's psychosocial well-being, decrease discipline problems, reduce aggression and school suspensions (Brown et al., 2008).

1.6. Health care costs of obesity

In 1995, the direct health care costs of obesity in the US have been estimated to account for 5.7% of total health care expenditure. Comparable figures are somewhat lower than this for other western countries such as New Zealand (2.5%), France (2%), and Australia (2%). These figures underestimated the full direct costs of weight related disease because they estimated the costs for the population with BMI. 30 kg/m² and omitted any burden of lesser forms of overweight (BMI 25–30 kg/m²). A study in Netherlands suggests the costs attributed to BMI 25–30 kg/m² are three times the cost of BMI. 30 kg/m². The direct costs of obesity are predominantly from hypertension, diabetes, and cardiovascular disease. Indirect costs, which are far greater than direct costs, include physician visits, workdays lost,

premature mortality and disability pensions which all increase as BMI increases. Intangible costs (impaired quality of life) have not been estimated, but given the psychological and social consequences of obesity, they are most likely to be enormous. As obesity is related with number of co-morbid diseases and conditions that treatment is required, the rising rates of obesity have resulted in notable increases in direct medical spending for overweight and obese individuals (Dor, Ferguson, Langwith, & Tan, 2010). Other individual costs related with being obese: presenteeism and absenteeism, lost wages, and higher costs related with the purchase of personal goods. (Wolf & Colditz, 1998).

While individuals bear the full burden of some costs, such as the value of lost wages or lost life, employees and employers share the burden for many other costs such as short-term disability, direct medical costs, and productivity losses. Government pays a significant portion of costs associated with obesity for Medicaid and Medicare beneficiaries. Estimates of medical cost of adult obesity in the United States range from \$147 billion to nearly \$211 billion per year. (Finkelstein, Trogon, Cohen, & Dietz, 2009). The majority of the spending is being generated from treating obesity-associated diseases such as cardiovascular disease and diabetes, among others. Obesity is responsible for \$61.8 billion in Medicaid and Medicare spending. Medicaid and Medicare spending would be 8.5% and 11.8% lower, respectively, in the absence of obesity. (Cawley and Meyerhoefer, 2012). Medical costs associated with obesity are estimated to increase if obesity rates continue on their current track by \$48 - \$66 billion per year in the United States, and by 2030, the loss of economic productivity could be as high as \$580 billion annually (Wang, 2011). Nevertheless, reducing average Body Mass Index by just 5% by 2030 could notably contain health care costs around the country.

According to the new report by the World Bank, in the next 15 years, the cost implication of obesity, including healthcare and reduced productivity, among others, will amount to over \$7 trillion in Nigeria, as well as other developing countries. Obesity is considered both an environment-related and a lifestyle problem. The title of the report, “Obesity: Economic and Health Consequences of an Impending Global Challenge,” sourced from the bank’s website, sheds light on the negative impacts of the growing obesity epidemic, summarizing the number of people affected at two billion globally as of 2016 (THISDAY newspaper, 2020). Dr. Mohammed Pate, a Nigerian-born, Global Director for Health, Nutrition and Population at the World Bank, was cited in the report as saying that: “One of the most effective ways to

address non-communicable diseases is by ramping up investments in quality, affordable primary health care. “This is sensible both on the economic and health perspective. Putting more resources on the frontlines to treat and detect conditions early, before they become more serious, improves health outcomes, save lives, reduces health care costs and strengthens outbreak preparedness.” Based on the report, obesity is recognized as one of the most popular risk factors to non-communicable diseases, and disease itself as well. The report lays emphasis on why obesity and overweight are an impending global problem, especially for the poor people and also those who live in low or middle-income states, dispelling the myth that the problem is only in urban areas and high-income countries. It also provides many of the recent trends concerning obesity and overweight (THISDAY Newspaper, 2020). Since 1975, according to the report, recent data show that obesity has nearly tripled and now accounts for 4 million annual deaths worldwide. In 2016, over 2 billion adults (44%) were reported to be obese or overweight with more than 70% of them living in a low or middle-income states. In the next 15 years, the World Bank report projects that based on the trend, the costs of obesity will amass to a total more than \$7 trillion in the developing countries. For example, in China between 2000 and 2009, health care costs related with obesity increase from 0.5 percent to more than 3 percent of annual health care expenditure in China. “In Brazil by 2050, it is predicted that obesity-connected health care costs will double to more than US\$10 billion from less than US\$6 billion in 2010. “The health care costs are not the only focus point, but as well as the indirect costs due to reduced absenteeism, work productivity, early retirement, etc., that the individuals and society will have to bear. For example, one research estimated an increase of the indirect costs of obesity/overweight in China from 3.6 percent of GNP in 2000 to 8.7 percent of GNP in 2025 (THISDAY Newspaper, 2020). “Research indicates that investments today in cost-effective interventions could save 8.2 million lives in poorer states and generate \$350 billion economic benefits by 2030. The report added that this is equal to a return of \$7 per person for every dollar invested. It recognized the factors fueling the obesity epidemic as largely environmental and behavioral. These involve easier access to ultra-processed and sugary and foods; a decline in physical activity associated to technological advances at home and in the labor force; and greater consumption of unhealthy foods often related to an increase in income and wealth.

Also cited in the report is the exposure to environmental risks, such as constrained access to basic services and air pollution. “Today, overweight and obesity-related diseases, such as heart diseases, cancer, and diabetes, are part of the top-three killers in every region of the globe except in Sub-Saharan Africa. “Containing overweight and obesity is a global public good,” statement made by the Vice President for Human Development at the World Bank, Annette Dixon. (THISDAY Newspaper, 2020)

1.7. Impact of school breakfast programs

The impact of school breakfast programs Schools provides nutritious food throughout the day, including breakfast, lunch, snacks, and after school. Breakfast program in school to help meet students’ nutritional needs. Research recommends that participation in breakfast programs plays a role in student behavior, cognition, and academic performance. In Minnesota, according to research, many low-income children are eligible for free breakfast programs, but cannot get to school early enough to take part or avoid the program due to the stigma associated with eating a free breakfast (Hunger-Free Minnesota, 2013) In the 2009-10 school year, 47 low-income children participated in school breakfast programs for every 100 children who ate free or reduced lunch (Public Health Law Center, 2012). In the 2011-12 school year, children with low-income eligible for free and reduced meals missed twenty-nine million school breakfasts, meaning the Minnesota schools missed more than \$53m in federal funds (Hunger-Free Minnesota, 2013) To add to lost federal funds, students who do not participate in school breakfast are at risk for increased absences, adverse behavior, reduced concentration, and poor academic performance.

Better attendance — Numerous studies, one in Minnesota included, have shown that student attendance improves in schools that implement universal-free school breakfast programs (Cook, Ohri-Vachaspati & Kelly, 1996; Meyers, Sampson, Weitzman, Rogers & Kayne, 1989; Wahlstrom & Begalle, 1999).

Improved behavior — The inner-city students taking part in a universal-free school breakfast program had a little behavior issues 6 months after the program begun (Kleinman et al., 2002). Implementing disciplinary actions also have been shown to decrease in schools that offer a universal-free school breakfast program (Wahlstrom & Begalle, 1991; Murphy, Drake, & Weineke, 2005) Pupils whose parents complains they often do not get enough to eat are more likely to have been suspended

from school, have seen a psychologist, and have difficulty getting along with other adolescents (Alaimo, Frongillo & Olson, 2001).

Improved concentration — A Minnesota study discovered that a school breakfast program improved alertness and concentration among children (Wahlstrom & Begalle, 1999). Identically, children in schools with universal breakfast programs reported having better attention and more energy than those attending schools with no universal breakfast programs (Redden, Wahlstrom, & Reicks, 2002). Experimental study with 9 through 11-year-old children indicated that those children who weren't served breakfast had a slower memory recall (Pollitt & Matthews, 1998). Better academic performance — Several studies indicate that academic performance can be improved by school's breakfast programs. Pupils who do not acquire sufficient meals are more likely to repeat a grade (Alaimo et al., 2001; Kleinman et al., 1998). In Massachusetts, Elementary children who took part in a school breakfast program did better on standardized tests than those who qualified but did not take part (Meyers et al., 1989). Identically, at an inner-city school, students in a universal-free school breakfast program at showed improved math grade 6 months after the beginning of the program (Kleinman et al., 2002).

1.8. Influence of the physical environment

Current research collaborates knowledge from the fields of behavioral economics, food marketing and psychology to analyze how individual choose what to eat. Researchers carried out an experiment at a local high school in New York, to test if by making healthier foods more convenient would lead to their increased intake. The researchers collaborated with the school to make a convenience line in the lunchroom that healthier foods are served. Post 16-week period, there was increase of healthier foods by 18% and the decrease number of grams of unhealthy foods consumed by almost 28%. Also, the number of healthier foods eaten as a percent of total consumption increased from 33% to 36% (Hanks, Just, Smith, & Wansink, 2012). In an earlier study, some of the same researchers noticed that simply moving the salad bar from the corner to the center of the school lunchroom led to increased sales and intake of items from the salad bar (Just & Wansink, 2009). These studies illustrate that straightforward, a relatively low-cost changes to a lunchroom's physical environment can have an impact to the type of foods students choose to eat. Furthermore, to re-designing space, researchers identified positive effects of other tactics like: Offering students a choice between two vegetable options, for instance celery and carrots, as opposed to being required to eat only one

type of vegetable (Just & Wansink, 2009). Having students pay cash for unhealthy food and drinks, example soft drinks and desserts, and by restricting prepaid debit cards to healthier foods. In their analysis and experiments, researchers observed that this restriction didn't lead to reduced participation or revenue or in school lunch. Alternatively, higher sales of healthier food were yielded (Just & Wansink, 2009). A public incentive to eradicate unhealthy foods in 2006, Connecticut implemented a HFC (Healthy Food Certification) that offers schools participating in the National School Lunch Program a 10% per lunch incentive (including free, paid, and reduced lunches) to eradicate unhealthy foods. Certification was connected with more students taking part in school lunch programs, with researchers documenting an increase between 7 percent and 23 percent for high- and middle-school programs. Yearly revenue for an average school district increased by approximately \$30,000 (Long, Luedicke, Dorsey, Fiore, & Henderson, 2013). This study illustrated that HFC increased participation in school meal programs, while also reducing students' access to unhealthy foods, possibly leading to a long-term impact of enhanced health outcomes in regards to the access to adequate nutrition and reduced levels of obesity. The Connecticut incentive model could inform other multi-sector or states, collaborative efforts that want to decrease the presence of unhealthy foods and encourage participation in school meal programs.

In Finland, some development has been clearly made in several aspects of nutrition and food policy: improvement in mass catering, access to nutrition education and information, pricing and quality requirements favorable to a healthy diet, and increased availability of healthier food products. The eating patterns of the Finns have improved in connection to some recommended macronutrients and foods (Milio, 1998). The structural changes in food and farm production are largely the outcome of new economic and political realities both in Finland and globally, resulting in the Government focusing on consumer-oriented market, fiscal efficiency, decentralization and a more competitive. This new environment is creating pressures to expand markets in new foods for Finns and other Europeans and reduce surplus animal fat production who, for reasons of demography, living or working or health arrangements, demand new and healthier foods sometimes. Some leaders in health have been able to work and make proposals that are consistent both with economic and political imperatives and with health needs (Milio, 1998). Although the populations health status is improving and in some respects is exemplary, illness rates and diet-related death and risk factors (such as obesity and serum cholesterol) are high and their decline, along with some of the healthy changes

in eating patterns, has lost pace since the mid-1980s (since the adoption of nutrition policy ironically). The more occurrence of slow improvements, the higher will be the economic and social costs. Major problems in policy implementation exist. Even though much has been done in demonstration and research and in development of national guidelines (in public labeling and catering, for instance) translating such soft technology into action is an apparent lag and monitoring its implementation to improve corrective measures at the operational level (Milio, 1998). This problem may possibly increase with decentralized budget control as well as a less regulated market, where by listening to the consumer (Individual, caterer or retailer) may not necessarily result in healthier products are more precise consumer information, specifically as foreign media and products continue to attract Finnish young people (Milio, 1998). The lack of a leading plan body that can authoritatively anticipate and assess challenges in implementation, solve them and monitor and coordinate the necessary action is fundamental to these issues. Great progress in farm and economic policy development and food enterprises can give conditions supportive of nutrition and health goals if such desires are systematically taken into account and given the chance to moderate potential negative changes. Such accounting will require initiative, clarity of tactic purpose and organization by nutrition and health leaders if it is to be effective.

1.9. General strategies for obesity prevention

The World Health Organization's Regional Office for Europe regards obesity prevention to be one of its highest priorities (WHO, 1997). It called for comprehensive, immediate action by governments and others in community by arranging a ministerial program on counteracting obesity. The association is advocating a range of actions that would make it less difficult for individuals to embrace a healthy lifestyle. The goal is to prevent more increase in obesity rates and to contain rates progressively in the next decade (WHO, 1997). Given the rising spread of obesity, thus attenuating the rise should be seen as a success. Another challenge for health planners is that obesity and its secondary health costs are related with more minority and socially deprived population groups. Any measures based on educative, cognitive interventions will tend to benefit more affluent and educated individuals, as such accentuating the social health gradient. Measures directed at availability, changing the price, nutritional characteristics and changing the price of food may have a positive impact across social groups. World Health Organization has advocated the involvement of the different government sectors, as well as the civil society and private sector. The EU (European Union) initiative the "Platform on Diet and Physical Activity" has stimulated the commitments from the food

industry, as well as advertisers. The effectiveness and importance of these commitments is being evaluated. The United States private sector has sponsored initiatives like “America on the Move,” which bases on a “small changes” approach (WHO, 1997).

There is no single or simple remedy to the obesity epidemic. It’s a wide problem and there need to be a multifaceted approach. State and local organizations, policy makers, community and business leaders, school, healthcare and childcare professionals, and individuals must work together to create an environment that encourages a healthy lifestyle. For adolescents and children, prevention of obesity implies the need to:

- Promote an active lifestyle.
- Limit television viewing.
- Promote the intake of fruits and vegetables.
- Restrict the intake of energy-dense, micronutrient-poor foods (e.g., packaged snacks).
- restrict the intake of sugars-sweetened soft drinks.

Other measures include modifying the environment to enhance physical activity in communities and schools, micronutrient-poor foods, creating more opportunities for family interaction (eating family meals), providing the necessary skills and information to make healthy food choices, and reducing the awareness of young children to heavy marketing practices of energy dense.

In Advancing countries, special focus should be given to avoidance of overfeeding stunted population groups. Nutrition programs designed to prevent or control under-nutrition need to assess stature in collaboration with weight to contain providing excess energy to adolescent of normal weight-for-height but low weight-for-age. In Nations in economic transition, as populations become more sedentary, as well as able to access energy-dense foods, it is necessary to maintain the healthy components of traditional diets (fruits, NSP and high intake of vegetables). Education provided to low socio-economic status communities and mothers that are food insecure should emphasize that obesity and overweight do not represent good health. Low-income communities globally and populations in Nations in economic transition regularly replace traditional micronutrient rich foods by heavily marketed, energy dense fatty and sugars-sweetened beverages (soft drinks), sugary and salty foods. These trends, added with reduced physical activity, are related with the rising spread of obesity. Tactics are required to improve the quality of diets by increasing

consumption of vegetables and fruits, as well as to increase physical activity, to stem the epidemic of obesity and related diseases (WHO, 2000).

Adolescence now lasts from 10 to 24 although it used to think to end at 19 (BBC, 2018). In this research, I will be evaluating the behaviors of people from the ages of 15 – 24 years from Nigeria and Ukraine, and will suggest some actions which could be done by the government and the media to promote healthy nutrition.

CHAPTER 2

METHODOLOGY

2.1. Preamble

This chapter explains the methodology used in conducting this research work. It explains the research design, sampling technique used, population and sampling size, sources of data, research instruments as well as reliability and validity of the instrument. Also, the chapter explains the method of data analysis and justification of choice.

2.2. Study Area

The study was conducted in Uyo, Akwa ibom state, Nigeria, and Kyiv, Ukraine. Correspondents were students of University of Uyo and National University of Kyiv-Mohyla Academy respectively.

2.3. Type of study

This research focuses on attitudes, perception and knowledge towards dietary intake among adolescents in Uyo and Kyiv. I opted for the Qualitative and the Quantitative research method. The Qualitative research seeks an in-depth understanding of social phenomena within their natural setting. It is focused on the "why" instead of the "what" of the social phenomena and depends on the direct experiences of individuals as meaning-making agents in their everyday lives. The Quantitative research collects information from existing and potential audience using sampling methods and sending out online surveys, online polls, questionnaires, etc., the results of which can be depicted in the form of numerical. The Qualitative and Quantitative nutrition education research assist me first, by helping me understand the factors that influence dietary behavior, and second, by providing a systematic method of investigating the most effective methods for influencing dietary behavior to promote health. The Qualitative and Quantitative research method was very essential in my research proposal as it assisted me carry out the research efficiently and effectively.

2.4. Research design and setting

This study is a descriptive study on how diet and healthy eating habits are the requirement for improving health among adolescents. Descriptive research design will aid to obtain information to systematically describe the phenomenon, and situation of the study population. More specifically, it helps answer the what, when, where, and how questions regarding the research problem.

2.5. Population of study

The study population consisted of undergraduates of University of Uyo, and National University of Kyiv-Mohyla Academy, covering a wide range of discipline. The students participated voluntarily and were in either 1st through 4th year of study.

2.6. Sample size

The sample size which is the population of individuals with characteristics interest of my study is a total of 24 respondents, from the ages of 15 - 24years. I used the stratified sampling techniques, where I first divided the study population into 2 relevant subgroups; 15-19 years, and 20-24 years, in the study population, with each of the subgroups containing 10 and 14 members respectively. A stratified sample is one that ensures that subgroups (strata) of a given population are each adequately represented within the whole sample population of a research study.

2.7. Data collection tools

The qualitative method of data collection was collected through one-to-one online interviews. The snowball and the convenient sampling method were very essential in selecting respondents in my research. I got in contact with a friend, who is a member of the National agency for food and drugs administration (NAFDAC), where he specializes in dietary recommendations in Nigeria. He introduced me to 2 obese adolescents and 12 other respondents from the University of Uyo. I was able to gather a total of fourteen (14) interested respondents from Uyo, Nigeria. They are 9 females (1 obese) and 5 males (1 obese) between the ages of 15-24 years. In Kyiv Ukraine, I was able to acquire 10 respondents, 5 males (1 obese) and 5 females (1 obese) between the ages of 15-24 years from National University of Kyiv-Mohyla Academy. For the Quantitative mode of data collection for my research, I opted for the online Questionnaire. Participants took these questionnaires at a convenient time and also thought about the answers at their own pace. All the respondents were asked the same questions, and they gave answers in their own words. I used the restricted questions (the close-ended format, which would enable the respondent to choose between a “Yes” or a “No” options and also options provided). This gave me the opportunity to carefully formulate and structure the data collection plan with precision. A questionnaire without an adequate interpretation can be quite passive and also miss out on some finer hints, leaving the responses open to interpretation. In this case, I simplified the interpretation of the questions to the understanding of everyone.

2.8. Procedure of study

Email was sent to interested respondents, stating the requirement to fill in the questionnaires. Content sheet was included as well, as it was stated that their privacy and confidentiality is protected.

2.9. Data Analysis

Comparative, text, and content analysis were implemented. The City of Uyo, Nigeria and Kyiv, Ukraine were analyzed to show how adolescents from both cities are similar or different in their manner of approach to healthy foods. Measurement of adolescents' behavior towards consumption of salt, sugar, fat & oil, and also how many times adolescents take a meal in a day that contains 75% vegetable was carried out.

2.10. Limitation of the study

The sample size of 24 is Insufficient, and this limit the credibility of the results.

Time constraints limited the study, as interviews and questionnaires were acquired in a lengthy period due to the armed-conflict in Ukraine.

Table 3.1 List of the sampled respondents from Uyo and Kyiv city:

States	Number selected	Percentage
Uyo, Akwa Ibom state, Nigeria	14	58.33%
Kyiv, Ukraine	10	41.67%
Total	24	100%

CHAPTER 3

RESULTS

3.1. Introduction

This chapter shows the result obtained from the study, discussion, interpretation and evaluation of the study. An online structured interview was carried out on four (4) obese patients, two (2) each from Uyo and Kyiv. The respondents gave permission for the interview to be recorded and to use the data for the study purpose by signing a consent form. Confidentiality was assured, were only me had access to the data, this encouraged the respondents to provide genuine answers. To achieve anonymity, I allocated a unique identifier for each respondents using only the identifier when further processing the data.

Questionnaires were sent to eighteen (18) respondents, ten (10) from Uyo, and eight (8) from Kyiv respectively. Participants took these questionnaires at a convenient time and also thought about the answers at their own pace. All the respondents were asked the same questions, and they gave answers in their own words.

For the purpose of this research, the World Health Organization (WHO) nutrition recommendations was used to determine if the study population attained or failed in dietary intake. The WHO recommends that free sugar intake should be reduced to

less than 10% of total energy intake, daily salt consumption should be less than 5g, the amount of total fat intake should reduce to less than 30% of total energy intake.

3.2 Results obtained from the study

Demographic information of participants

Country	Frequency	Percentage
Uyo, Nigeria	14	58.33%
Kyiv, Ukraine	10	41.67%
Sex		
Male	10	41.67%
Female	14	58.33%
Age		
15-19 years	17	70.83%
20-24 years	7	29.17%
Discipline		
Medicine	2	8.33%
Pharmacy	8	33.33%
Management	7	29.17%
Engineering	5	20.83%
Health science	2	8.33%
Year of study		
1 st year	8	33.33%
2 nd year	7	29.17%
3 rd year	8	33.33%
4 th year	1	4.16%
Marital status		
Married	-	
Single	24	100%
Separated/divorced	-	

The table shows that 58.33% respondents are from Uyo, while 41.67% from Kyiv. 41.67% of the respondents are male while 58.33% are female. Respondents between

the ages of 15-19 years are 70.83%, whereas respondents between the ages of 20-24 years are 29.17%. All responds are college students and are single in status.

Summary of the semi-structured interview

Correspondents in Uyo, Nigeria.

After several attempts to have an interview with my respondents, I finally succeeded. They appeared so friendly which helped the interview to be interesting, free flowing, and most importantly without bias. Our conversations are as follow;

I: Good afternoon, xx, my name is Essien, Wisdom.

R: Good afternoon.

I: How are you doing? I hope everything is well.

R: Everything is well o! We thank God. How are you?

I: I am okay, thank you. I want to firstly thank you immensely for creating time out of your busy schedule to attain this interview. I am indeed very privileged to have you as my respondent.

R: You are welcome, but I have only 1 hour to spare.

I: Okay xx, 1 hours would go a long way. Thank you once again! How are you coping after the coronavirus lockdown?

R: Hmm! It has been challenging. People are now leaving in fear. Businesses are still put on hold, no source of income at the moment. We are now forced to stay at home and do nothing. We just eat, sleep, wake up, and repeat (laughs). Anyways, we thank God for life. We are still breathing, and hopefully everything will soon return back to normal. It hasn't been easy. Hmm!

I: Everything you said is true xx. Even in the educational sector, schools have been shut down. We now study online which has been very challenging. Sometimes the internet works badly, noise from the neighbors during classes, and most especially, it does not carry the same energy as going to class to study, but we need to move forward. Sincerely, sometimes It has really been a challenge, but as you said, hopefully everything will be alright very soon.

R: Amen o! we must keep praying.

I: Well xx, it is interesting that you made mention of some of the things you do at home during this period, which is very understandable, as majority of people are in the same shoes (smiles). You mentioned about eating and sleeping often, and this is one of the focal points of this interview. I have a few questions to ask and your answers are very relevant, as it will help me to create a solution that will address exactly what you need.

R: Okay O! I hope it will bring money O! Because time is money! (laughs).

I: (laughs) I understand, and it will bring something worth more than money as good health is the optimum in life.

R: (smiles) No problem, I was only joking. So, what are the questions?

I: Thank you xx. So how do you understand good diet?

R: **Arh! It's easy now! I know that good diets are when you eat good food and not stay hungry. I know that I am on good diet because I eat good and I don't stay hungry.**

I: What do you think are the good diets you can take?

R: Well, I already told you that I eat good food. For instance, rice, soup, potatoes, chips and many more. It makes me feel active especially for the fact I eat more than three times in a day (smiles).

I: So, do you use Oil, sugar and fats in moderation?

R: **Oil?! I measure oil depending on the food I am cooking. If it requires enough oil, then I measure the quantity needed, if it requires little oil, I also measure the needed quantity.**

I: How do you measure it?

R: (smiles) **It is just natural. If you know how to cook, you will know the right amount of oil to use while cooking. I measure it in my mind (smiles).**

I: And what about sugar and fats?

R: Oh! I almost forgot! I love sugar, but I don't really fancy fats.

I: Okay xx. Do you eat red meat, example beef or lamb often?

R: **Definitely! I use beef in almost all the food I cook.**

I: What about fish? Do you also eat them often?

R: Hmmm! Fish is delicious, but I prefer beef (smiles).

I: What do you think about eating in company?

R: (pauses for a while) Well, in general, I don't like eating in company because it will make me uncomfortable. I prefer to eat alone; it will enable me eat comfortably and to my satisfaction.

I: Do you eat fruits regularly?

R: I love fruits, but I don't eat them regularly. I eat them when they are available. My favorite fruit is mango.

I: Okay xx. Do you engage in physical exercises?

R: (laughs) My brother, I don't really like feeling pains, so I do not engage in it. (shocked) Oh! I have to go now. I need to attain to something urgent. If you have more questions, you can forward to my mail. I will answer when I am ready.

I: Thank you very much madam! You have been.....

R: (interrupts) Emm! Before I go, what is the purpose of this interview?

I: The purpose of this interview is to get ideas on the kind of food people eat, how it is prepared and other ideas related to diets. This will help me recommend healthy diets that can protect the human body against certain types of diseases, example; obesity, diabetes and hypertension. I will definitely give you feedback in regards to your answers.

R: Hmmm! Interesting. I will await it. Goodbye.

I: Have a lovely day madam.

The other obese correspondent in Uyo gave similar answers in terms of oils usage in meals, vegetable consumption, animal product consumption, and the use of sugar

Correspondents in Kyiv, Ukraine.

I: Good afternoon, xx, my name is Essien, Wisdom.

R: Good afternoon.

I: How are you doing? I hope everything is well.

R: Everything is well at the moment! We are alive. How are you?

I: I am okay, thank you. I want to firstly thank you immensely for creating time out of this very difficult time to attain this interview. I am indeed very grateful to have you as my respondent.

R: Thank you for having me.

I: Okay xx. Thank you once again! How are you coping during this armed conflict? I understand this is a very difficult period for everyone.

R: I just want this to end already. I am physically and mentally depressed. No jobs, no source of income at the moment. We are now forced to live our lives in fear. I just want this to end so everything will soon return back to the way it used to be. It has indeed been a terrible situation.

I: Everything you said is true xx. Even in the educational sector, schools have been shut down. We now study online which has been very challenging. Sometimes the internet works badly, noises from gunshots and bombing during classes. It has really been a challenge. I pray for peace to reign.

R: Yes.

I: So, I would love to ask you a couple of questions regarding food choices. I understand this may not be the right time, but your response will be very valuable to my research.

R: Okay, I already decided to participate, so it's okay.

I: Thank you xx. So how do you understand good diet?

R: **I think health food must contain the necessary nutrients like carbohydrates, fat, protein and so on.**

I: Great! You are correct. So, what is your favorite food?

R: **I love cheese burger and shawarma, until the war, I used to eat any of those daily.**

I: Do you think they are good diets to take?

R: **I guess no, but I love them anyways, and my parents rarely cook at home. Most of the time we order for food, so I need to include my want as well**

I: So, do you use Oil, sugar and fats in moderation?

R: I really have no idea because I rarely cook. But I guess I drink a lot of coke. I guess I can count the number of days I have gone without drinking something sweet.

I: Okay xx. Do you eat red meat, example beef or lamb often?

R: Yes! My shawarma is always made with beef

I: What about fish? Do you also eat them often?

R: Yes, I do, I order for fish when I eat in the restaurant.

I: What do you think about eating in company?

R: I don't like eating in company because it will make me uncomfortable. I prefer to eat alone.

I: Do you eat fruits regularly?

R: Yes, I eat them regularly. I love strawberries and oranges!

I: Okay xx. Do you engage in physical exercises?

R: I do not engage in it, although I used to do yoga before.

I: Okay xx, thank you very much for your time and responses.

R: You are welcome, I hope I have been of help

I: Most definitely! I will definitely give you feedback in regards to your answers.

The other obese correspondent in Kyiv gave similar answers in terms of excess consumption of sugar, excess junk foods

Comparative analysis; Measurement adolescents' behavior towards consumption of salt, sugar, fat & oil, and also how many times adolescents take a meal in a day that contains 75% vegetable.

Study population	Less than 30% Vegetables	Excess sugar, salt, fat & oil
Uyo, Nigeria	50%	25%
Kyiv, Ukraine	37.7%	50%
General study population	87%	75%

Study population:

Adolescents between the ages of 15-24 years. A total of 20 respondents. 10 respondents from Uyo, Nigeria, and 8 respondents from Kyiv, Ukraine. All respondents were students from the chosen higher institutions.

Result analysis:

25% of adolescent population in Uyo consume excess sugar, salt, fat and oil compared to 50% of adolescents in Kyiv. However, 75% of population in Uyo did not know if they use fat in moderation or not.

37% of Kyiv population consumes less than 30% vegetables compared to 50% of adolescents in Uyo. However, 50% of total population of adolescents in Kyiv consume more than 75% of vegetable.

Conclusion; The in-depth interview showed that parental influence and lack of time for homemade meals played a major role in food choices. In the questionnaires, great percentage of adolescents from Uyo, and Kyiv failed to attain WHO recommendations on Dietary nutrition. This was due to lack of information about dietary nutrition and easy accessibility of unhealthy foods.

CHAPTER 4

DISCUSSION

4.1. Discussion and result evaluation

The in-depth interviews and the questionnaires assist us to analyze the bases and the understanding of the case-study from each of the study-group.

During the interviews with the obese correspondents in Uyo, Nigeria, there was presence of parental influence and limitation of healthy food availability in the region. In Uyo, there is a culture that encourages individuals to stick to a certain pattern of food, neglecting numerous healthy foods in the process. Parental influence plays a huge role, as parents of adolescents in Uyo are hugely responsible for what food is to be prepared, as such consistently sticking with traditional delicacies. Based on the reply from the respondents, most of the food they consumed was processed with excess salt and oil (e.g Afang soup, Okro soup, Atama soup, Ekpang Nkukwu e.t.c). Accessibility of Health food is challenging. Healthy products like legumes, broccoli, quinoa, almond, are very rare to find, and very expensive when available. Akwa Ibom state has a population of more than 4 million people, and approximately, 57% of people are living in poverty and 42% are none poor. Among those that are poor, 29% are grouped as moderately poor, and 28% are grouped as extremely poor

(ekpo and Uwatt, 2005). This is one of the factors that discourages them to purchase such goods, as they prefer to stick to the most convenient, cheap, and preferable delicacies, according to one the respondents.

Also, some of the respondents who had the resources to acquire these health foods, believe that eating healthy is consuming to their satisfaction a food of their choice, while others believe it to be consuming excess animal products and carbohydrate. This is an issue because their food choices still fell within the range of traditional delicacies.

In Kyiv, Ukraine, after the interview with the correspondents, there were signs of similar cases as that of Uyo. However, the most outstanding was that adolescent consume excess junk foods. Junk food is an unhealthy food that is high in calories from fat or sugar, with little dietary minerals, fiber, vitamins, protein, or other essential forms of nutritional value (O'Neill, 2006). Their most regular meal of the day is lunch, and during this period there is high intake of junk foods and drinks high in sugar. This has turned to a custom due to the fact that many of the adolescents and their guidance are too engaged with studies and work, so there is rarely time for homemade food. One of the respondents stated that she prefers fast food, as it helps save time and energy. She further added that sometimes she buys a lot of take-aways for the next day, to enable her eat before leaving for school in the morning. Availability of restaurants and fast foods in almost all major streets in Kyiv also played a major role. Nowadays there are more than fifty-five (55) McDonald's restaurants in 16 Ukraine, and more than a dozen of McDonald's restaurants are in Kyiv. Although majority of the respondents are aware of the importance of health eating, they appeal for junk foods.

The goal of nutrition education is to reinforce specific nutrition-related practices or behaviors to change habits that contribute to poor health; this is done by creating a motivation for change among people, to establish desirable food and nutrition behavior for promotion and protection of good health. The Factors perceived as influencing food choices in the study included parental influence on eating behaviors (including the religion or culture of the family), food availability, appeal of food, time considerations of adolescents and parents, hunger and food craving.

Conclusion

Obesity is a very serious non-communicable disease, classified as a chronic disease of a multi-factorial inception and related to all ages. The development of dietary patterns, healthy lifestyle, and physical activity, in general, in young people and children reduce the risk of developing obesity later in life.

Dietary patterns have seemed to persist over the years, and so academic years represent an important period for modelling a healthy lifestyle. The years of university studies signifies, from an educator's perspective, the final opportunity to implement nutritional education among many students. The diet of students from various countries is often classified as unhealthy, poor in vegetable and fruits, with irregularity in eating patterns and a high frequency of fast-food choices, which is a serious concern, this is because eating habits established in this period of life can determine people's long-term health.

Furthermore, behaviors embraced by students during their university education have the capability to make an additional impact on the community because young adults can play essential roles in society (e.g., health ministers, physicians, police officers, lawyers), as well as being decision-makers and having notable behavior attitudes and patterns, and therefore the lifestyle behaviors and health of university students are of interest to the public health.

Recommendations

Individual eating patterns are shaped throughout time by a variety of social and economic factors that operate differently. This is how Diet changes over time. These variables include one's income, the cost of food (which will affect the accessibility and affordability of nutritious foods), one's personal tastes and views, cultural customs, geographical location, and environmental factors (including climate change). Consequently, supporting a healthy food environment – including food systems that support a varied, balanced, and nutritious diet – necessitates the cooperation of numerous sectors and stakeholders, including government, as well as the public and commercial sectors.

Governments have a crucial role in fostering an atmosphere where people can develop and keep healthy eating habits. The following are some examples of effective policy-makers creating a healthy food environment;

Akwa Ibom state, Nigeria

1. Incentivize the production, distribution, and retailing of nutritious foods such as fruits, vegetables, eggs, fish, meat, and fortified foods to increase their availability and affordability.

2. Implement policies and laws to protect young children from unhealthy processed and ultra-processed foods and beverages, as well as harmful marketing practices aimed at children and families.
3. Utilize a variety of communication methods, such as digital media, to tell caregivers about what is a healthy and safe diet for young children and to provide them with advice on how to do so.
4. By making investments in the recruitment, training, oversight, and encouragement of community-based counselors and workers, caregivers will have greater access to high-quality counseling and support on feeding young children.
5. Deliver nutritional supplements, homemade fortifiers, and supplementary foods with added nutrients to young children who are at risk for micronutrient deficiencies, anemia, and poor growth and development.
6. Create social transfers (cash, food, and/or vouchers) that promote wholesome meals for young children, even in vulnerable environments and in response to humanitarian emergencies, rather than undermining them.
7. Utilize social protection programs to increase caregivers' understanding of how to feed young children by offering guidance and education as well as by promoting the use of diet and wellness services.
8. Make sure that the state development agenda prioritizes young children's right to a healthy diet and those laws and policies are consistent across all systems and sectors.
9. By establishing goals and evaluating results with the use of sector-specific monitoring systems and household surveys, Akwa Ibom state may improve public responsibility for young children's nutrition.
10. Investigate the availability, affordability, and desirability of enhancing the quality of early children's nutrition, as well as context-specific barriers, facilitators, and paths.

Kyiv, Ukraine

Establishing consistency among national investment and trade programs, as well as trade, food, and agricultural policies, to advance a healthy diet and safeguard public health by:

- Increasing incentives for producers and retailers to grow, use and sell fresh fruit and vegetables;
- Reducing incentives for the food industry to continue or increase production of processed foods containing high levels of saturated fats, trans-fats, free sugars and salt/sodium;

- Encouraging reformulation of food products to reduce the contents of saturated fats, trans-fats, free sugars and salt/sodium, with the goal of eliminating industrially-produced trans-fats;
- Implementing the WHO recommendations on the marketing of foods and non-alcoholic beverages to children;
- Establishing standards to foster healthy dietary practices through ensuring the availability of healthy, nutritious, safe and affordable foods in pre-schools, schools, other public institutions and the workplace;
- Exploring regulatory and voluntary instruments (e.g. marketing regulations and Diet labeling policies), and economic incentives or disincentives (e.g. taxation and subsidies) to promote a healthy diet; and
- Encouraging transnational, national and local food services and catering outlets to improve the nutritional quality of their foods – ensuring the availability and affordability of healthy choices – and reviewing portion sizes and pricing.

References

- Am J Clin Nutr. (1991); Health implications of obesity 53(6 Suppl):1595S-1603S.
- Alaimo, K., Frongillo, E. A., Jr, & Olson, C. M. (2001). American children's cognitive and food insufficiency, psychosocial and academic development. *Pediatrics*, 108(3), 824b.
- Almuneef, A.; Alam, I.; Badr, M.; Bader, B.; Almuammar, M.; Abulmeaty, M.; Almajwal, A.; & Razak, S. (2019). Malnutrition is common in children with cerebral palsy in Saudi Arabia. A cross-sectional clinical observational study. *BMC Neurol.* 19, 317.
- Akinyele IO. (2009). Ensuring nutrition and food security in rural Nigeria: an assessment of the information needs, challenges, and analytical capacity. IFPRI- NSSP (Nigeria Strategy Support Program) Background Paper No. NSSP 007.
- Babu SC, Blom S. (2020). Building resilience for nutrition and food security. *Conference Brief.* 2014;6
- Barker DJP, Simmonds SJ, Bull AR, & Osmond C, (1990). Placental and fetal size and risk of hypertension in adult life. *Brit Med J*; 301:259-62

- Bellisle, F. (2004). Effects of diet on cognition and behavior in children. *British Journal of Nutrition*, 92(2), S227–S232.
- Belot, M., & James, J. (2020). Healthy educational outcomes and school meals. *Journal of Health Economics*, 30(3), 489-504.
- Brown, J. L., Prothrow-Stith, D. & Beardslee, W. H., (2008). Impact of school breakfast on children's learning and health: An analysis of the scientific research.
- Caballero B, & Popkin BM., (2002). *The nutrition transition: Diet and Disease in the Developing World*. London: Academic Press.
- Cawley, J., & Meyerhoefer, C. (2012) The Medical Care Costs of Obesity: An Instrumental Variables Approach. *Journal of Health Economics*, 31(1): 219-230,
- Centers for Disease Control. (2013). Childhood obesity facts. Coleman-Jensen, A., Nord, M., & Singh, A. (2013). Household food security in the United States in 2012.
- Cordonnier D. Événements quotidiens et bien-être à l'adolescence, (1995). Vers de nouvelles stratégies d'éducation pour la santé. Genève: Éd Méd Hyg.
- Delisle H. La sécurité alimentaire, ses liens avec la nutrition et la santé, (1998). In: Delisle H, Shaw DJ (Eds). *The Quest for Food Security in the Twenty First Century*. *Can J Development Studies*; 19 (Special Issue): 307-21
- Dor, A., Ferguson, C., Langwith, C., Tan, E. (2010) A Heavy Burden: The Individual Costs of Being Overweight and Obese in the United States. The George Washington University Department of Health Policy Research Report. Available at: http://www.stopobesityalliance.org/wpcontent/themes/stopobesityalliance/pfs/Heavy_Burden_Report.pdf.
- Ejoh SI, Samuel FO. Identification of traditional green leafy vegetables, benefits to consumers and level of utilisation in a rural farming community in southwest Nigeria: qualitative findings. *West Afr J Food Nutr*. 2016;13(1):10–23. [Google Scholar]
- Ejoh SI, Wireko-Manu FD, Page D, Renard CMGC. Traditional green leafy vegetables as underutilized sources of micronutrients in a rural farming community in south-west Nigeria 1: Estimation vitamin C, carotenoids and mineral contents. *South Afr J Clin Nutr*. 2019;In Press. doi: 10.1080/16070658.2019.1652964
- Finkelstein E.A., Trogon J.G., Cohen J.W., Dietz W. (2009) Annual medical spending attributable to obesity: payer- and service-specific estimates. *Health Affairs*. 28: w822-w831.

- Flegal KM, Williamson DF, Pamuk ER, Rosenberg HM. *Estimating deaths attributable to obesity in the United States*. Am J Public Health. 2004 Sep; 94(9):1486-9.
- Flyman MV, Afolayan AJ. The suitability of wild vegetables for alleviating human dietary deficiencies. South Afr J Botany. 2006;72(4):492–497. doi: 10.1016/j.sajb.2006.02.003
- Finucane MM, Stevens GA, Cowan MJ, Danaei G, Lin JK, Paciorek CJ, Singh GM, Gutierrez HR, Lu Y, Bahalim AN, Farzadfar F, Riley LM, Ezzati M, Global Burden of Metabolic Risk Factors of Chronic Diseases Collaborating Group (Body Mass Index). *Lancet*. 2011 Feb 12; 377(9765):557-67.
- Greene AL. Future time perspective in adolescence: the present of things future revisited. J Youth Adolesc 1986; 15:99-113
- Higl Cook, J. T., Ohri-Vachaspati, P., & Kelly, G. L. (1996). Evaluation of a universally-free school breakfast program demonstration project, Central Falls, Rhode Island. Medford, MA: Center on Hunger, Poverty and Nutrition Policy, Tufts University.
- Florence, M. D., Asbridge, M., & Veugelers, P. J. (2008). Diet quality and academic performance. *Journal of School Health*, 78(4), 209-215.
- Gómez-Pinilla, F. (2008). Brain foods: The effects of nutrients on brain function. *Nature Reviews Neuroscience*, 9(7), 568-578. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2805706/>
- Grivetti LE, Ogle BM. Value of traditional foods in meeting macro- and micronutrient needs: the wild plant connection. *Nutr Res Rev*. 2000;13(1):31–46. doi: 10.1079/095442200108728990
- Guh DP, Zhang W, Bansback N, Amarsi Z, Birmingham CL, Anis AH (2009) *The incidence of co-morbidities related to obesity and overweight: a systematic review and meta-analysis*. BMC Public Health. Mar 25; 9():88.
- Hanks, A., Just, D., Smith, L., & Wansink, B. (2012). Healthy convenience: Nudging students toward healthier choices in the lunchroom. *Journal of Public Health*, 34(3), 370-376.
- Hartline-Grafton, H., Henchy, G., & Levin, M. (2012). Healthier school meals: A summary of the new USDA standards for school breakfast and lunch. Retrieved from the Food Research and Action Center website: http://frac.org/pdf/school_meal_nutrition_rule_summary.pdf Hunger-Free Minnesota. (2013). Initiatives: School breakfast. Retrieved from <http://hungerfreemn.org/initiatives/school-breakfast/>
- Hawks SR, Goudy MB, Gast JA. Emotional eating and spiritual well-being: a possible connection? *Am J Health Educ*. 2003;34(1):30–33.

- Hayward K, Colman R. (2009)*Cost of obesity*. GPI Atlantic.
- Hilbert A. *The burden of the burden: current advances in weight stigma research*. Obes Facts. 2010 Feb; 3(1):5-6.
- Icard-Vernière C, Olive F, Picq C, et al. (2015)Contribution of leafy vegetable sauces to dietary iron, zinc, vitamin a and energy requirements in children and their mothers in Burkina Faso. *Plant Foods Hum Nutr.*;70(1):63–70. doi: 10.1007/s11130-014-0462-5
- Ifon ET, Bassir O. (1979)The nutritive value of some Nigerian leafy green vegetables—part 1: Vitamin and mineral contents. *Food Chem.*;4(4):263–267. doi: 10.1016/0308-8146(79)90014-1 [Crossref], [Web of Science ®], [Google Scholar]
- Johns T. Plant biodiversity and malnutrition: simple solutions to complex problems. *AJFAND*. 2003;3(1):45–52. doi: 10.4314/ajfand.v3i1.19134
- Just, D., & Wansink, B. (2009). Smarter lunchrooms: Using behavioral economics to improve meal selection. *Choices*, 24(3), 1-7. Retrieved from <http://farmdoc.illinois.edu/policy/choices/20093/2009306/2009306.pdf>
- Kleinman, R. E., Hall, S., Green, H., Korzec-Ramirez, D., Patton, K., Pagano, M. E., & Murphy, J. M. (2002). Diet, breakfast and academic performance in children. *Annals of Nutritional Metabolism*, 46(Suppl 1),24-30. Page 8
- Kleinman, R. E., Murphy, J. M., Little, M., Pagano, M., Wehler, C. A., Regal, K., & Jellinek, M. S. (1998). Hunger in children in the United States: Potential behavioral and emotional correlates. *Pediatrics*, 101(1), E3. Retrieved from: <http://pediatrics.aappublications.org/content/101/1/e3.long>
- Kuh D, Power C, Blane D, Bartley M. (1997) Social pathways btw childhood and adult health. In: Kuh D, Ben-Shlomo Y (eds). *A life course approach to chronic disease epidemiology*. Oxford: Oxford University Press, 1997:169-98
- Kuperminc, M.; Stevenson, R. (2008) Growth& nutrition disorders in children with cerebral palsy. *Dev. Disabil. Res. Rev.* 14, 137–146.
- Larson-Nath, C.; Goday, P. Malnutrition in Children with Chronic Disease. *Nutr. Clin. Pract.* 2019, 34, 349–358.
- Lartey A, Meerman J, Wijesinha R. (2018) Why food system transformation is essential and how nutrition scientists can contribute. *Ann Nutr Metab.* 2018;72(3):193–201. doi: 10.1159/000487605
- Li, J., & O’Connell, A. A. (2012). Obesity, high-calorie food intake, and academic achievement trends among U.S. school children. *The Journal of Educational Research*, 105(6), 391-403.
- Long, M., Luedicke, J., Dorsey, M., Fiore, S., Henderson, S. (2013). Impact of

- Connecticut legislation incentivizing elimination of unhealthy competitive foods on National School Lunch Program participation. *American Journal of Public Health*, 103(7), 59-66.
- Meyers, A. F., Sampson, A. E., Weitzman, M., Rogers, B. L., & Kayne, H. (1989). School breakfast program and school performance. *American Journal of Diseases of Children*, 143(10), 1234-9.
- Minnesota Department of Health. (2012a). Children & adolescent overweight fact sheet. Retrieved from:
<http://www.health.state.mn.us/cdrr/obesity/pdfdocs/childreoverwightfactsheet.pdf>
- Minnesota Department of Health. (2012b). Great Trays annual report, 2012. Retrieved from:
http://www.health.state.mn.us/divs/hpcd/chp/cdrr/nutrition/greattrays/pdfs/Great_Trays_Annual_Report_2012.pdf
- Mendez MA, Popkin BM. (2005) Globalization, urbanization, and nutritional change in the developing world. *Electron J Agr Dev Econ.* ;1:220–41. [Google Scholar] [Ref list]
- Milio N. (1998) European food and nutrition policies in action. Finland's food and nutrition policy: progress, problems and recommendations. WHO Reg Publ Eur Ser. ;73:63-75. PMID: 9935290.
- Mushta, S.M.; Khandaker, G.; Power, R.; Badawi, N. (2019) Cerebral Palsy in the Middle East: Epidemiology, Management, and Quality of Life. In *Handbook of Healthcare in the Arab World*; Laher, I., Ed.; Springer: Cham, Switzerland.
- O'Neill, Brendon (2006). "Is this what you call junk food?". *BBC News*. Retrieved June 29, 2010.
- Parks, Troy (16 Dec 2016). "WHO warns on kids' digital exposure to junk-food ads". *American Medical Association*.
- Popkin B. Technology, transport, globalization and the nutrition transition. (2006) *Food Policy.* ;31(554):569.
- Reilly JJ, Kelly J. (2011) Long-term impact of overweight and obesity in childhood and adolescence on morbidity and premature mortality in adulthood: systematic review. *Int J Obes (Lond)*. Jul; 35(7):891-8.
- Roizman, Tracey. "Reasons Eating Junk Food Is Not Good". SFGate (Demand Media). Retrieved 29 March 2015.
- Rosengren A, Lissner L. (2008) The sociology of obesity. *Front Horm Res.* ; 36():260-270.

- Sanders TG. (1982) The problems of nutrition in Brazil. *Am Univ Field Staff Rep South Am.* (16):1-19. PMID: 12338491.
- Scott, Caitlin (2018). "Sustainably Sourced Junk Food? Big Food and the Challenge of Sustainable Diets". *Global Environmental Politics*. 18 (2): May . 93–113. doi:10.1162/glep_a_00458. ISSN 1526-3800. S2CID 57559050.
- Scott KM, Bruffaerts R, Simon GE, Alonso J, Angermeyer M, de Girolamo G, Demyttenaere K, Gasquet I, Haro JM, Karam E, Kessler RC, Levinson D, Medina Mora ME, Oakley Browne MA, Ormel J, Villa JP, Uda H, Von Korff M *Int J Obes (Lond)*. (2008) ; 32(1):192-200.
- Searcey, Dionne; Richtel, Matt (2017). "Obesity Was Rising as Ghana Embraced Fast Food. Then Came KFC". *The New York Times*. ISSN 0362-4331. Retrieved 2017-10-19.
- THISDAY Newspaper 2020
<https://www.thisdaylive.com/index.php/2020/02/11/obesity-to-cost-nigeria-others-7tn-says-world-bank/>
- Trust for America's Health and the Robert Wood Johnson Foundation. (2012) *F as in Fat*. Pg. 28. Available at:
<http://healthyamericans.org/assets/files/TFAH2012FasInFatFnlRv.pdf>.
- Wang YC et al. (2011) Health & Economic Burden of Projected Obesity Trends in the USA and the UK. *The Lancet*, 378. Available at:
[http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(11\)60814-3/fulltext](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(11)60814-3/fulltext).
- Visscher TL, Seidell JC (2001). *The public health impact of obesity*. *Annu Rev Public Health*.; 22():355-75.
- Wolf AM, Colditz GA. (1998) Current estimates of the economic cost of obesity in the United states. *Obes Res*. 6(2):97-106.
- World Health Organization, (2000) (WHO Technical Reports series, No. 894). *Obesity: preventing and managing the global epidemic*. Report of a WHO Consultation.
- World Health Organization. (1997) *Obesity: preventing and managing the global epidemic*. Geneva: WHO. (WHO Technical Report Series, No 894.)
- Zimmer, Ben (2010). "On Language: Junk". *New York Times*. Retrieved 19 March 2015.

APPENDIX

QUESTIONNAIRE

How many times do you eat in a day?	1X	2X	3X	More
What meal do you consider to be your main meal of the day?	Breakfast	Lunch	Dinner	Supper
What does your main meal consist of and how is it prepared?	Freshly home-cooked produce	Restaurant meal	Pre-cooked, microwave or TV dinner.	Junk food
What does your main meal on the	Freshly home-cooked produce	Restaurant meal	Pre-cooked, microwave or TV dinner.	Junk food

weekend consist of and how is it prepared?				
Have you been avoiding some food for health reason?	Yes	No	Yes, but not for health reasons	
What percentage of your regular diet consists of meat and meat products?	75% or more	50%	Less than 30%	I don't know
How much of your diet consists of vegetables and non-animal products?	75% or more	50%	Less than 30%	I don't know
Do you or have you ever had cholesterol problem?	Yes	No	I don't know	
What is your current BMI?	Less than 18.5 (underweight) 18.5-25 (ideal weight)	25-30 (overweight)	35 or more (obesity)	I don't know
Do you drink alcohol?	Yes	No	Sometimes	
	Yes	No	Sometimes	

Do you take multivitamin?				
Do you smoke?	Yes	No	Sometimes	
How often do you snack?	Often	Rarely	Sometimes	I don't
Are your meals?	Large portion Extra-large portion	High fat	High carbohydrate	High sugar
Do you currently exercise?	Always	Rarely	Sometimes	No I don't
Do you use oil, fat, sugar, and salt in moderation?	Always	Rarely	Sometimes	I don't know
How old are you?	15 – 19 years old	20 – 24 years old		
Do your parents always decide what meal to eat?	Always	Rarely	Sometimes	No they don't