### OBESITY AND IT IMPLICATIONS AMONG RURAL ADULT

**ABSTRACT**

This study was carried out to assess obesity and it implications among rural adult. Specifically, the study determined the level of obesity prevalence among rural adults, identified the factors that influence overweight and obesity among rural adults, identified the health risk factors associated with overweight and obesity among rural adults and, suggesting ways to prevent obesity among rural adults. The study employed the survey descriptive research design. A total of 77 responses were validated from the survey. The study adopted the Trait theories (Lay’s Theory). From the responses obtained and analysed, the findings revealed the factors that influence overweight and obesity among rural adults include: hereditary, pre natal and early life influences, poor diet and too litle physical activities. Furthermore, the findings revealed that the health risk factors associated with overweight and obesity among rural adults include cardiovascular diseases, type 2 diabetes, high blood pressure and certain types of cancers.. The study recommends stakeholders to make policies that will recognize and address the emerging challenges of childhood overweight and obesity in Nigeria in general during this period of Health Sector Reform.

**CHAPTER ONE**

**INTRODUCTION**

* 1. **BACKGROUND OF THE STUDY**

In affluent societies, obesity is the most common nutritional disorder. Obesity is a condition characterized by an abnormally excessive level of body fat (Edinburgh 1995). It is defined as abnormal adipose tissue growth caused by fat cell enlargement (hypertrophic obesity) or an increase in the number of fat cells (hyperplastic obesity) or a combination of the two (Park 2004). Excess fat accumulates as a result of an imbalance in energy intake and expenditure. Obesity's importance cannot be overstated because it is linked to increased morbidity and mortality. It predisposes to the development of serious diseases and reduces the efficiency and happiness of those who suffer from it.

Obesity is a chronic disease that affects both developed and developing countries, and it affects both children and adults. Obesity is now so common that it is displacing more traditional public health concerns, such as malnutrition (Park 2004). It is now a worldwide phenomenon. It is extremely difficult to assess the size of the problem and compare prevalence rates across countries because no exact figures are available, and definitions of obesity are not standardized. However, it is estimated that 10 to 20% of children and adolescents in developed countries are affected (Stone, & Saxon, 2005).

Overweight is defined as having an excess of body weight but not necessarily body fat; a body mass index (BMI) of 25 – 29.9. In children aged two years and older, the Body Mass Index (BMI) is acceptable for determining obesity (Deurenberg, Westrate & Seidell 1991). Although children and adults have the same BMI number, the criteria used to interpret the meaning of the BMI number for children and teens differ from those used for adults. BMI age and gender percentiles are used (www.cdc) The Centers for Disease Control and Prevention (CDC) has published tables to help determine this in children (www.cdc.gov). Overweight (but not obese) is defined as a BMI between the overweight and obesity cut-off values, whereas obese is defined as a BMI greater than the obesity cut-off value (www.cdc.gov). The BMI for normal weight is lower than the overweight cut-off value (Stone, & Saxon, 2005).

* 1. **STATEMENT OF THE PROBLEM**

Obesity is a health hazard and a detriment to one's well-being, as evidenced by increased morbidity and mortality (Park 2004). It plays an important role in the natural history of other chronic and noncommunicable diseases. Obesity is now recognized as a serious public health concern due to its rising prevalence and numerous negative health consequences (Kosen, 2018). Chronic disease incidence is rising much faster in developing countries than in developed countries. There is compelling evidence that childhood obesity is becoming more prevalent in low- and middle-income countries. In many developing countries, malnutrition and obesity coexist (Katz, 2007). Obesity has numerous health consequences. The first issues that arise in these obese children are usually emotional or psychological in nature. Obesity often leads to serious conditions such as diabetes, high blood pressure, heart disease, sleep problems, and cancer. Other disorders include liver disease, menarche or early puberty, eating disorders such as anorexia, skin infections, asthma, and other respiratory problems (Mayoclinic 2009). According to studies, overweight people are more likely to become diseased. Obesity during adolescence has been linked to an increase in adulthood mortality rates. Obese people are frequently subjected to teasing, harassment, and ridicule at school. They may also face harassment, discrimination, and name-calling from family members and neighbors at home. These can result in anxiety, depression, low self-esteem, frustration, and even withdrawal. According to a study, obesity is on the rise, and physical inactivity, disordered eating perceptions, and disordered behaviors are linked to higher rates of overweight and obesity. Obese people have carotid arteries that have aged prematurely by up to thirty years, according to a 2008 study, as well as abnormal cholesterol levels. A 15-year-old obese child has the carotid artery of a 45-year-old. According to World Health Organization projections, noncommunicable diseases will account for roughly three-quarters of all deaths in the developing world by 2020 (Katz, 2007), and adolescent obesity is likely to be a major risk factor in this. This emerging public health issue of rising childhood obesity rates in developing countries will almost certainly impose a massive socioeconomic and public health burden on poorer countries in the near future. Nigeria is a developing country in Africa.

* 1. **OBJECTIVES OF THE STUDY**

The primary objective of this study is to assess obesity and it implications among rural adult. Specifically the study is aimed at:

1. Examining the level of obesity prevalence among rural adults
2. Identifying the factors that influence overweight and obesity among rural adults
3. Identifying the health risk factors associated with overweight and obesity among rural adults.
4. Suggesting ways to prevent obesity among rural adults.
	1. **RESEARCH QUESTIONS**

The following research questions will be answered in this study:

1. What is the level of obesity prevalence among rural adults?
2. What are the factors that influence overweight and obesity among rural adults?
3. What are the health risk factors associated with overweight and obesity among rural adults?
4. What ways can be used to prevent obesity among rural adults?
	1. **SIGNIFICANCE OF THE STUDY**

Since it has been demonstrated that interventions are usually ineffective once overweight and obesity have occurred (Pinhass-Hamiel O, Zietler P 2000), it is critical to generate and disseminate research information to policymakers, health care providers, parents, and the general public so that obesity can be dealt with at an early age. The emerging trends in the factors influencing overweight and obesity among rural adults are definite health risks that necessitate definite studies and data for intervention planning. Because of the limited number of studies available in Nigeria (as in other developing countries), little is known about the prevalence of overweight and obesity, particularly in the South Eastern States of Nigeria. More studies and data are needed in Nigeria to provide a reliable assessment of the problem of overweight and obesity in Nigeria, as well as to compare its prevalence with that of other regions of the world. Studies like this one are therefore required to uncover this ostensibly hidden but critical public health issue. This research will serve as an additional and contribution to these efforts. This study can equip stakeholders to make policies that will recognize and address the emerging challenges of obesity in Nigeria in general during this period of Health Sector Reform. Seminars with evidence of this research data could be organized in Uyo West Local Government Area in particular, for students and parents to initiate and stir up voluntary preventive health measures for themselves against obesity.

* 1. **SCOPE OF THE STUDY**

This study will be focused on assessing obesity and it implications among rural adult. Specifically this study will be focused on examining the level of obesity prevalence among rural adults, identifying the factors that influence overweight and obesity among rural adults, identifying the health risk factors associated with overweight and obesity among rural adults and suggesting ways to prevent obesity among rural adults.

Residents of Uyo Local Government in Akwa Ibom State will serve as enrolled participants for this survey.

* 1. **LIMITATIONS OF THE STUDY**

This study is subject to the limitations and challenges that come with any research that uses questionnaires, such as noncompliance by some respondents and insufficient information about the problem under investigation. Finally, financial and time constraints were also some of the challenges that posed a lot of limitations on the scope of this study.

* 1. **DEFINITION OF TERMS**

**Obesity**: Obesity is a complex disease involving an excessive amount of body fat. Obesity isn't just a cosmetic concern. It is a medical problem that increases risk of other diseases and health problems, such as heart disease, diabetes, high blood pressure and certain cancers.

**Implications:** the conclusion that can be drawn from something although it is not explicitly stated.

**CHAPTER TWO**

**REVIEW OF LITERATURE**

**INTRODUCTION**

Our focus in this chapter is to critically examine relevant literature that would assist in explaining the research problem and furthermore recognize the efforts of scholars who had previously contributed immensely to similar research. The chapter intends to deepen the understanding of the study and close the perceived gaps.

Precisely, the chapter will be considered in three sub-headings:

* Conceptual Framework
* Theoretical Framework and

**2.1 CONCEPTUAL FRAMEWORK**

**Concept of Obesity**

Obesity is a multi-factorial disorder. Overweight or obesity is the leading cause of hypertension, diabetes, osteoarthritis, and various types of cancers in women like breast cancer and uterus cancer, menstrual disorder and infertility and many more diseases. Obesity is emerging as a serious problem throughout the world not only among adults, but also children, teenagers, and young adults. Of the factors contributing to obesity, stress seems to be particularly important as stress is a precursor for irregularity in diet, lack of exercise and addiction, each being considered independent factors leading to obesity (Mayoclinic 2009).

The problem of obesity is pertinent in both developing and developed nations alike. When a country achieves economic development, the diet and physical activity patterns of its citizens change greatly. This phenomenon, observed in developing countries, is known as “nutrition

Obesity is defined as an excess accumulation of fat in the human body by the World Health Organization. Body Mass Index (BMI) [BMI=weight/ (height) is the most widely used criterion to measure weight status and define overweight and obesity (WHO, 2000). Children grow constantly; thus, their BMI is adjusted for age and sex (e.g. standard deviation scores), according to reference data (Crawford, & Paden, 2006). In the past four decades, there has been an upward trend in the prevalence of childhood obesity. In 2015, the global prevalence was 5%, and 107.7 million children between the ages 2 and 19-years-old were estimated to have obesity worldwide. In addition, 38 million children under five years old had overweight or obesity in 2019 (UNICEF (United Nations Children’s Fund) 2019). In Sweden, the prevalence of obesity among children at 6-yearsold is 5%, while it is twice as much among children who are 9-years-old (Policy Statement 2006). According to recent estimates, the obesity prevalence among school-aged children in Sweden has increased five times over the past three decades, with the steepest increase observed in the last 10 years.

Overweight and obesity result from an imbalance between energy consumed (too much) and energy expended (too little). Globally, there has been a shift in food consumption patterns whereby people are consuming more energy- dense foods (those high in sugars and fats); at the same time, they are engag- ing in significantly reduced physical activity. Using the World Health Organization’s (WHO’s) cutoffs, adults with a body mass index (BMI; this is weight/height squared) of 25 or more are classified as overweight; those with a BMI of 30 or more are classified as obese. The terms overweight and obesity both identify people who are at risk for health problems from having too much body fat. For simplicity, this executive summary uses the term obesity to refer to both conditions.

The ticking time bomb of obesity has huge potential economic and health impacts, especially for the poor. As of 2016, an estimated 44 percent of adults (more than 2 billion) worldwide are overweight or obese, and over 70 percent of them live in low- or middle-income countries (Otinwa, 2009).

Over 70 percent of countries—the vast majority of which are low- and lower-middle-income countries—currently face a double burden: a high prevalence of both undernutrition and obesity. As per capita income increases, the burden of obesity shifts to the poor and to rural areas across low- and middle-income countries. Over 55 percent of the global rise in obesity is found in rural areas; in South East Asia, Latin America, Central Asia, and North Africa this increase is close to 80 or 90 percent of the recent shift. This has significantly closed the urban-rural gap in most regions except Sub-Saharan Africa. Today most of the countries in the world with high levels of the double burden are found in Sub-Saharan Africa, South Asia, selected South East Asian countries (Indonesia being most prominent), and Guatemala.

This is a marked shift from the 1990s, when Mexico and most of Central America, Bolivia, Peru, South Africa, Francophone Africa, the Arab Republic of Egypt, parts of Central Asia, and the Philippines faced severe levels of the double burden.

In addition, in many low- and middle-income countries, for an array of genetic and epi-genetic reasons, populations are more susceptible to NCDs at BMI levels lower than 25 (overweight).

**The Health and Economic Costs of Obesity**

Increasing health care costs linked to increasing obesity rates are a trend across the world, and both overweight and obesity are significant risk fac- tors for NCDs.

The critical issue in understanding the economic impacts of obesity is that mortality, albeit significantly increased, is not the only major outcome. Reduced productivity, increased disabilities, increased health care costs, early retirement, and reduced length of disability-free healthy living across the life cycle—all of which will impact human capital outcomes in countries—are also significant consequences. As obesity rates are rapidly increasing, global attention to this issue is increasing. Poor diets, a lack of physical activity, and overweight and obesity are now recognized as the top preventable causes of NCDs in all countries in the world (Otinwa, 2009).

The estimated economic costs of obesity vary considerably, since stud- ies use different methodologies to estimate direct and indirect costs. For example, estimates from the United States range from US$89 billion to US$212 billion in total costs; those from China are estimated at 3.58 and 8.73 percent of gross national product (GNP) in 2020 and 2025, respectively; and Brazil projects a doubling of the obesity-related health care costs from US$5.8 billion in 2010 to US$10.1 billion in 2050. The effects of obesity on productivity, early retirement, and disabilities have rarely been studied in low- and middle-income countries. In addi- tion, the same poor diets dominated increasingly by ultra-processed foods and the reduced activity patterns that affect obesity increase the risk of a wide array of NCDs directly as well as indirectly.

Whatever estimates one might subscribe to, the big picture message is that increasing health care costs linked to increasing obesity rates are a trend across both the developed and the developing world. Preventing obe- sity therefore makes sense from a public finance perspective. Governments and development partners have a key role to play in this effort, including by ensuring that consumers are informed about the health and other con- sequences of their dietary and lifestyle choices.

**Factors Affecting Obesity**

Three sets of factors can affect overweight/obesity: (1) early life undernutrition and reduced linear growth, (2) reduced energy expenditure through changes in technology and lifestyles in all phases of life, and (3) a set of factors linked to changing food systems and the resultant shifts in food con- sumption and eating behaviors.

The analyses presented in this report suggest that a range of conditions that emerge with globalization, urbanization, and technological develop- ment are driving the rise in obesity rates globally:

1. Rapid reductions in physical activity in all domains of activity, from mar- ket-related work and home production (for example, water gathering, food preparation/cooking) to transportation and leisure in low- and middle-income countries in the last 15–35 years, and global access to labor-reducing technologies.
2. Rapid shifts in the built environment, which contributed both to reduced physical activity in many cases and to changes in the food environment.
3. The spread of modern food retailing and a rapidly changing food system. This has led to major shifts toward diets dominated by ultra-processed foods, and was linked to higher price increases for healthy foods than for unhealthy products.
4. Women entering the formal market labor force in large proportions in most high-income countries and in low- and middle-income countries, requiring changes in food consumption.
5. Shifts in eating patterns, which have led to increased snacking and away-from-home eating.
6. Increased country and household income, which have been linked to a shift to greater obesity among the poor in all high-income countries and in an increasing proportion of low- and middle-income countries.
7. Increased wealth in many low-income countries, which has shifted them to middle-income countries and in some cases to high-income countries.

Modern media and marketing that, along with globalization, has shifted social and cultural norms related to dietary and activity patterns.

Based on these emerging conditions, the conceptual framework below highlights the actionable direct and indirect factors associated with obesity (Misra, & Khurana, 2008).

**Global Attention to Overweight/Obesity**

In recent years, overweight/obesity has come to the fore on the global development agenda. The Sustainable Development Goals (SDGs) make reference to overweight and obesity under SDG target 2.2, which aims to end all forms of malnutrition (including overweight and obesity) by 2030. The World Health Assembly in 2012 adopted six new nutrition targets, including “to ensure that there is no increase in childhood overweight by 2025”. According to White, (2007), the WHO has also issued several other recent reports, including the Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2020 and the “Global Nutrition Targets 2025: Childhood Overweight” Policy Brief, among others, which provide a road map of policies and interventions to meet these targets. The Global Burden of Disease (GBD) program has highlighted overweight/obe- sity as a key issue in global health and dietary risks as one of the top several risk factors for the global burden of disease in low- and middle-income countries (Institute for Health Metrics and Evaluation 2016). The 2019 State of the World’s Children report (UNICEF 2019) also focused on childhood obesity.

Global parliamentarians met in Rome at the Second International Conference on Nutrition in 2014 and noted that food system solutions are needed to address the global scourge of unhealthy diets (FAO and WHO 2018). In countries as diverse as all the small countries of the Caribbean Community (CARICOM) region, most Latin American countries, South Africa, Thailand, Malaysia, many Middle Eastern nations, and the Western Pacific Islands, ministers of health and in most cases prime ministers have noted that overweight/obesity and the related consequences represent the major preventable causes of poor health and increased health care costs. Recognition of the problem is slowly growing in many low- and middle- income countries, but global action that promotes healthy diets and major shifts in food systems is slow.

All of the above commissions and reports are complementary and high- light the need for concerted action across sectors (health, education, agri- culture, trade, macroeconomics, and so on) to address this agenda. Despite the fact that the World Bank Group is uniquely positioned to work across these sectors and use the innovative investment and policy instruments at its disposal, the World Bank’s investments in this space are still modest (White, 2007).

**Assessment of Obesity**

Direct methods for measuring body fat content include skin fold thickness hydrodensitometry (underwater-weighing), bioimpedance and computer tomography (CT) (Kiess et al., 2001). The most widely used measures for assessing obesity are the body mass index (BMI) and waist circumference (WC).

**Body Mass Index (BMI):** Body mass index is also referred to as the Quetelet index (Hutchison, 2002). It is typical and the hall mark of physical examination and thus the most common and conventional parameter of assessing obesity (Ulasi & Ebenebe, 2007). It is calculated by measuring a person’s weight in kilograms and then dividing by that person’s height in meter squared. BMI = Weight (Kg)/Height (m2 ) (Summerton et al., 2002). BMI estimates general or total obesity (Otinwa, 2009) and is known to correlate well with three other methods of measuring body fat: total body water, body densitometry and whole body potassium measurements (Hutchison, 2002).

Assessment of obesity is based on an internationally acceptable range of BMI in adults as shown below

BMI Assessment of Obesity BMI (kg/m2) ASSESSMENT

< 18.50 Underweight

18.50-24.90 Normal weight

25.0-29.90 Overweight

30.0-39.90 Obese

> 40 Extremely obese

**Waist Circumference:** Waist circumference is defined as the minimal circumference measured at the navel (Wajchenberg, 2000), however, waist circumference measured at the midpoint between the lower border of the ribcage and the iliac crest has been reported to be a surrogate marker of visceral obesity and also is seen to more closely correlated with the level of abdominal visceral adipose tissue and associated metabolic risk factors (Wajchenberg, 2000; Grundy, 2004; Dehghan et al., 2005).

**Patterns of Obesity**

Body fat tends to be distributed in different patterns (Alessio, 2003). Based on this, two distinct phenotypes are apparent in obese individuals. They are (i) Generalized obesity (ii) Abdominal obesity.

**Generalized Obesity:** This is also referred to as total obesity (Otinwa, 2009). Here, fat deposition is primarily in the peripheral depots such as the thighs and hips. It is described as gynoid obesity or pear shaped obesity (Goon, 2010).

**Abdominal Obesity:** Abdominal obesity is also called central obesity (Alessio, 2003). Increased/excess fat stored in the abdominal cavity is associated with type 2 diabetes and a poor cardiovascular profile in adults and children as well, proving that the regional distribution of the excess body fat is equally a factor for cardiovascular diseases as well as the degree of obesity (Cook et al., 2003).

Goon (2010), screened Nigerian women in Makurdi, Benue State for abdominal fatness using the waist-to- stature ratio (WSR). He found out that the prevalence of central obesity was at all ages evident, ranging from 35.8% (20-30 years) to 88.41% (41-50 years). The implication of this finding is that Nigerian women may be susceptible to metabolic syndrome. Ojofeitimi et al. (2007) has also reported that central obesity is not just common but culturally accepted among Nigerian women, as was seen in a study carried out in a university community in Western Nigeria that abdominal fat decreases first when people embark on physical activity sufficient to loose weight (Alessio, 2003).

**Etiology of Obesity**

It is known that obesity occurs as a result of an imbalance between energy consumption and energy expenditure (Ulasi & Ebenebe, 2007); however, the development of obesity cannot be addressed by a single cause (Dehghan et al., 2005). Due to the complexity of the neuroendocrine and metabolic systems that regulate energy intake, storage and expenditure, it has been difficult to quantitate all the relevant parameters over time in human subjects (Flier & Maratos- Flier, 2005). The causes of obesity include:

1. **Dietary Habit**

The concept of ‘food’ has changed from a means of nourishment to a marker of lifestyle and a source of pleasure (Dehghan et al., 2005). The influence of fast food eateries on nutrition has been identified as a negative trend though it has become an important part of the new and modern lifestyle in Nigeria (Otinwa, 2009). Convenience foods are relatively affordable and have high level of calories, fat, simple carbohydrates and sodium, low levels of fibres and micronutrients. One third of children in USA eat fast food daily, with the intake of large amounts of sweetened beverages including soda, juices and sport drinks, and these have been linked to higher weight and risk of obesity (Skelton & Rudolph, 2007). The causes of high level of central obesity among Nigerian women may be partly due to the high-energy, high-fat dietary patterns in some cultural settings (Goon, 2010). Alcohol consumption also promotes weight gain by providing substantial energy and stimulating appetite (Summerton et al., 2002).

1. **Sedentary Lifestyle**

Apart from dietary habit, sedentary lifestyle is equally an environmental factor most associated with the prevalence of obesity (Ulasi & Ebenebe, 2007). The variation from country to country over time is critical to its prevalence. In societies where food consumption is high and people are involved in physical inactivity, central obesity seems to be a prominent problem.

Sedentary lifestyle is particularly associated with insufficient physical activity, excessive computer use and excessive television viewing (Schwarz, 2007). The current epidemic of inactivity and its association with obesity is strongly linked to societal, technological, industrial, commercial and financial factors (Policy Statement, 2006). Decrease in physical activity has been identified as a primary environmental influence on children/adolescent obesity, as well as on adult obesity (Deckalbaum & Williams, 2001). In the university community, students spend most of their waking hours in the classroom, library or perhaps on internet computer use. These may account for their getting little exercise as these activities require a lot of sitting down. Although the Nigerian adolescent has more access to recreation opportunities when compared to Botswana adolescents, it is doubtful if they make adequate use of them (Otinwa, 2009).

**Genetic and Endocrine Factors**

Twin studies have given some important genetic explanations that contribute to an individual’s predisposition towards the more common forms of obesity. When identical twins were reared apart, the weight of the twins was similar despite variations in the environment (Skelton & Rudolph, 2007). Parental obesity doubles the risk of adult obesity among children younger than ten years of age regardless of current weight (Skelton & Rudolph, 2007).

The factors that lead to such predispositions include:

**(i).Leptin:** The genetic basis of childhood obesity has been elucidated to some extent through the discovery of leptin (Kiess et al., 2001). Leptin is the product of the obesity (ob) gene which is expressed in adipocytes (Halass et al., 1995). It was discovered in 1994 when genetically obese (ob/ob) mouse lacked the ability to respond to or produce leptin resulting in severe obesity. The mouse ob gene is structurally similar to the human gene and several studies in rodents suggest that leptin acts as a signaling factor from adipose tissue to the central nervous system, regulating food intake and energy expenditure. It is hypothesized that via this leptin feedback loop, homeostasis of body weight and a constant amount of body fat are achieved (Caro et al., 1996).

The mechanism of leptin is such that it decreases neuropeptide Y in the hypothalamus and suppresses appetite (Sikaris, 2004). Letpin deficiency is characterized by the preferential deposition of fat mass giving a distinct clinical appearance with excessive amount of fat over the trunks and limbs. Only leptin deficiency among other genetic disorders of obesity is currently being treated with specific therapy (Skeleton and Rudolph, 2007), as reported that a dramatic and beneficial effect of daily subcutaneous injections of recombinant human letpin led to a reduction in body weight and fat in three congenitally leptin-deficient children.

**Effects of Obesity**

Obesity acts on many metabolic pathways producing various potential risk factors that it becomes virtually impossible to differentiate between the more important and less important (Grundy, 2004).

These effects can be said to be both psychological and physiological.

**Psychological Effects**

This effect may be most painful in the short run. It comes with difficulty in finding clothing, being picked last for teams and discrimination in employment opportunities and experiencing a limited social life (Weigley et al., 1997). Obese children tend to be viewed as more mature compared to their non-obese peers and this may have an adverse effect on their socialization (Dietz, 1998). Obese adolescents have been also reported to shun physical activities, noted to be passive, possess negative self-image and exhibit obsessive thinking about weight (Otinwa, 2009).

**Physiological Effects**

Obesity has important implication for health especially in terms of coronary heart disease (CHD). Leaders in the emerging field of cardiology have recognized obesity’s role in cardiovascular disease (Cook et al., 2003). Obesity changes metabolic, hormonal and haemodynamic functions (Dustan, 1985). Dietz (1998) identified that many of the cardiovascular consequences that characterize adult-onset obesity are preceded by abnormalities that begin in childhood. Sleep apnea and sleep- disordered breathing are more common in children and adolescents with obesity. Evidence of liver dysfunction with elevated plasma concentration of transaminases is associated with obesity (Otunola et al., 2010). Obesity has long been associated with menstrual abnormalities in women particularly in women with upper body obesity (Flier & Maratos-Flier, 2005), rectum and prostate cancers in men and breast cancers in females. It is also associated with complications in pregnancy and surgery (Weigley et al., 1997).

The plethora of minor and major effects associated with obesity has considerable impact on quality of life and some may reduce life expectancy (Schwarz, 2007).

**Health implications–Physical and psychosocial**

Childhood obesity once established, does track into adolescence and adulthood Astrup, (2008), and increases adult morbidity and mortality. Moreover, children with obesity have higher cardiometabolic risk, risk for liver disease and musculoskeletal pain (Sanders, Han, Baker, & Cobley, 2015; Skinner, Perrin, Moss, & Skelton, 2015). In addition to the impact on physical health, childhood obesity has a number of psychosocial consequences. Among those are poor quality of life, low self-esteem, decreased social functioning, weight stigmatisation, bullying, and low educational level in adulthood.

**Causes of Obesity**

Obesity is a chronic multifaceted condition, which stems from energy imbalance, i.e. excess energy intake in relation to one’s needs. However, obesity is not a simple function of energy intake and energy expenditure, since genetic susceptibility plays a clear role in obesity variability (Moayeri, Rabbani, Keihanidoust, Bidad, & Anari, 2008). Specifically, interrelationships between parents and their children may affect the child’s obesity status to varying degrees. A recent study in the UK provided evidence that genetic predisposition to obesity manifests as excess weight gain among children in obesogenic home environments, as described by availability of energy-dense foods and maladaptive parent-child interactions, compared to less obesogenic home environments.

**Obesity and Hypertension**

High blood pressure (hypertension) is better described as a trait rather than a specific disease and is represented quantitatively other than qualitatively (Boon et al., 2002). Blood pressure is determined by the balance between cardiac output and vascular resistance, of which a rise in either of these variables in the absence of a compensatory decrease in the other increases mean blood pressure (Ettinger, 2007). Obesity-induced hypertension is associated with increased peripheral resistance and cardiac output, increased sympathetic nervous system tone, increased salt sensitivity and insulin-mediated salt retention often responsive to modest weight loss (Flier & Maratos-Flier, 2001).

Hypertension is present in about half of all overweight individuals and obesity alone accounts for about 70% of essential hypertension (Sikaris, 2004). Obesity/overweight poses an environmental stress causing hypertension in genetically predisposed individuals (Dustan, 1985). Obese persons are reported to have a higher prevalence of elevated blood pressure and this is a strong risk factor of cardiovascular disease (Grundy, 2004). Johnson et al. (2009) however, submitted that elevated blood pressure does not play a primary role in early onset of metabolic syndrome as it was found to be moderately low in all sex-ethnicity groups in the sample population; other factors such as insulin resistance and dyslipidemia had stronger influence on the syndrome.

**Obesity and Insulin Resistance**

Obesity, particularly central obesity leads to insulin resistance (Alessio, 2003). Insulin resistance may be due to abnormal insulin molecule, excessive amount of circulating antagonists or due to target tissue defects, the last being the most common causes of insulin resistance (Frier & Fisher, 2002).

The primary action of insulin is to decrease blood glucose levels; resistance of the body to the action of insulin results in increased production of the hormone by the pancreas bringing about hyperinsulinemia (Steinberger & Daniels, 2003). Obesity increases the risk of cardiovascular disease in adults and has been strongly associated with insulin resistance in normoglycemic persons and increases the risk of insulin resistance in those who are genetically predisposed to developing type II diabetes (Frier & Fisher, 2002, Steinberger & Daniels, 2003). The extent of obesity is a determining factor of insulin resistance and the presence of the metabolic syndrome, as it was found to be greater in obese adolescents relative to non-obese adolescents (Bustos et al., 2010). Even though the causative link between central obesity and insulin resistance is on its way to be elucidated (Alessio, 2003), an association between adiposity and insulin resistance has been reported in adults and children revealing that weight loss is associated with an increased insulin sensitivity and a decrease in insulin concentration in both adolescents and adults (Steinberger and Daniels 2003).

**Prevention of Obesity**

Three levels of preventing obesity, particularly childhood obesity have been outlined by Deckalbaum & Williams (2001). Foremost is the primordial prevention which is aimed at maintaining normal body mass index (BMI) through childhood and adolescence.

Secondly, primary prevention is directed towards preventing overweight children (85th- 95th percentile BMI) from becoming obese and thirdly is the secondary prevention which focuses on treating obese children (BMI > 95th percentile) to reduce comorbidities and reverse overweight/obesity if possible.

Children are often considered the priority population for intervention strategies as it is difficult to reduce excessive weight in adults once it becomes established (Dehghan et al., 2005). Preventive measures however suggested are:

**Physical Activity**

As a result of disappointments that have followed controlled preventive trials, implementation of sustainable, economically viable and culturally acceptable active-living policies may likely be a successful strategy in preventing obesity (Policy Statement, 2006). This may include decreasing screen time which refers to time spent watching television, internet use and all forms of visual media; walking to school, parking cars farther away, and increase in physical activities (Katz, 2007; Moayeri et al., 2008 ).

**Food Sector and Food Choices**

Dehghan et al. (2005) viewed that since food prices influence food buying behaviour and consequently, nutrient intake, a small tax (but large enough to affect sales) on high-volume foods of low nutritional value, such as soft drinks, snack foods and confectionery may discourage their consumption. Also, providing tips for managing eating in social situations, take-out foods and food labeling/food label reading that indicates nutrition values might help consumers make the right choices of healthy foods (Katz, 2007).

Prevention of obesity is vastly preferred to treatment and as such, screening in order to identify at risk individuals and community based global education to promote and support behavioural change required for the maintenance of optimal weight may be beneficial (Akpa & Mato, 2008). By and large, strategies of intervention should be ethnical and culture specific (Grundy, 2004) as some individuals consider obesity, a feature to be admired and acquired (Ojofeitmi et al., 2007).

**Management and Treatment of Obesity**

It is likely that the single most effective approach to combating the cluster of life - threatening medical disorders that comprise the metabolic syndrome is weight loss (Alessio, 2003). Medical care advocates the first hand management of acute or chronic complications of obesity (Schwarz, 2007).

**Diet**

In a study, the reduction of the total fat content of ad libitum diet combined with physical activity was seen to produce weight loss and reduce almost all risk factors of cardiovascular disease in both short term and over periods as long as seven years, hence it is suggested that the optimal diet for prevention and management of weight gain and obesity among other nutritional disease is fat-reduced, fibre rich, high in low-energy density carbohydrates and restricted intake of energy-containing drinks. (Astrup, 2008). Another yearlong study of seventy-three pediatric patients aged seven (7) to seventeen (17) years under a protein-sparing modified fast, achieved rapid weight loss as there were significant reductions in the percentage overweight, BMI, total cholesterol, triacylglycerol and fasting serum insulin with no change in fat-free mass. The modified diet was also combined with vigorous exercise programs (Schwarz, 2007).

Studies in rodents and humans have indicated that long chain omega 3 polyunsaturated fatty acids (LCω-3 PUFA) potentially elicit a number of effects which might be useful for reducing obesity including suppression of appetite, improvement in circulation which might facilitate nutrition delivery to skeletal muscles, changes in gene expression which shift metabolism towards lean tissue and enhanced fat oxidation, leading to reduced fat deposition (Buckley & Howe, 2010). However, long term human studies are required to ascertain this claim. Calcium intake in higher doses was associated with reduced adiposity in a longitudinal study and there was also a 21% reduce risk of insulin resistance among overweight younger adults (Dehghan et al., 2005).

**Physical Activity**

Changes in adiposity have been related to lifestyle modifications in physical activity and nutrition (Cook et al., 2003; Astrup, 2008). The role of exercise and exercise programs as therapeutic strategies for obesity cannot be overemphasized (Kiess et al., 2001). Aerobic exercise has been shown in a prospective randomized controlled study of sixty-four children to reduce obesity-related risk factors, however physical activity should be a sustainable lifestyle rather than programmed exercises (Policy Statement, 2006). This will include walking for twenty to thirty minutes per day, reduction of time spent on internet computer use and television viewing daily, participating in sports and recreational activities, among other activities (Schwarz, 2007). Akpa & Mato (2008) also submitted that resistance exercise and aerobics lasting 45-60 minutes daily at least four days weekly may achieve increasing loss of visceral fat and percentage body fat.

**Drug Therapy**

Drugs and surgical procedures though used in adult obesity are still not generally recommended in children and adolescents with obesity (Kiess et al., 2001). Generally, drug treatment of obesity is required for long term management of weight loss with an expectation of between 5 and 15% of weight loss after three to six months and this is maintained by lifelong drug therapy (Akpa & Mato, 2008).

Orlistat, a drug used in the treatment of obesity is known to inhibit pancreatic and gastric lipases and thereby decreasing the hydrolysis of ingested triacylglycerol producing about 30% reduction in dietary fat absorption. Sibutramine, another drug used in obesity treatment is an appetite suppressant that acts through β₁- adreno receptor and 5-hydroxytrptamine (5-HT) receptor agonist activity. This drug is not recommended in individuals younger than sixteen (16) years and orlistat has been found to be effective in adolescents older than twelve (12) years. The drugs are associated with side effects such as constipation, insomnia and increase in blood pressure (Summerton et al., 2002).

Other medications used in the treatment of obesity are metformin, octreotide, and agents like green tea, ginseng, chromium, psyllicim, pyruvate, L- carnitine and hydroxycitric acid. There is still inadequate evidence regarding the efficacy and safety of these agents (Skelton & Rudolph, 2007).

**Surgical Treatment**

Bariatric surgical intervention should be the last resort for the treatment of obesity (Ulasi & Ebenebe, 2007) except in cases of morbid obesity which have defeated all other conventional methods of treatment (Akpa & Mato, 2008). Bariatric surgery is a form of plastic surgery which can be through vertical banded gastroplasty and gastric bypass (Summerton et al., 2002).

In adolescents, the safety of bariatric surgery has not been sufficiently studied. Infact, there have been reports that it may likely lead to folate deficiency in adolescent girls planning on future child bearing (Skelton & Rudolph, 2007).

**The Prevalence of Obesity in Rural Adults in Nigeria**

The prevalence of obesity, especially in rural Africa, is a growing concern in the medical community in recent years. Obesity has been identified as a significant risk factor for cardiovascular disease, cancer, and type 2 diabetes mellitus, which are leading causes of morbidity and mortality in Nigeria. To better understand the disparity in the prevalence of adult obesity between rural and urban Nigeria, researchers have identified risk factors that are associated with the high incidence and prevalence of obesity in the rural Nigerian adult population. Low income and lack of physical activity have been identified as factors that predispose rural Nigeria to increased risk of obesity, arguing that low-income Nigerians may not have access to the resources available to assist them in weight reduction. With rural Nigerians being at an income disadvantage, it creates a risk for obesity, which further predisposes them to chronic diseases such as hypertension, obstructive sleep apnea (OSA), diabetes, and coronary artery disease (Emejulu, Ojiako, & Onwuliri, 2010).

The rural residents were less physically active than their urban counterparts. They were disproportionately affected by chronic diseases and conditions associated with calorie imbalance, which included obesity.

Researchers have found reduced documentation of the physical activity levels in rural areas compared to urban areas. They suggested a need for more theoretically supported, methodologically rigorous, and empirically tested "rural strategies" for intervention on physical activity in rural Nigeria. In a pilot study, Ejike, Ugwu, & Ezeanyika, (2010), conducted lifestyle intervention among rural obese adults, behavioral changes, and increased physical activity using wearable activity devices like Fitbit. It was noted from the interviews that there was an increased enthusiasm in the use of activity feedback, self-monitoring, and motivation to lose weight. Although usability and satisfaction were observed, there was decreased exercise confidence, and patient activation was no different pre/post-pilot study.

**2.2 THEORETICAL FRAMEWORK**

**Trait theories (Lay’s Theory)**

People often think about obesity in the same way they think about other physical or psycho‐ logical traits: as a basic attribute that individuals possess to varying degrees. Dweck et al.have identified two opposing lay theories that characterize how people think and reason about a variety of traits, which are distinguished by the degree to which the trait is viewed as malleable (Morales, Punzalan, Paz-Pacheco, Sy, & Duante, 2008). People who hold an “entity theory” of intelligence (also known as “fixed mindset”), for example, think about the intellect as something hard-wired and stable, while those who hold an “incremental theory” (also known as a “growth mindset”) believe their intellectual abilities can grow through effort and hard work. Holding one of these theories is associated with a great deal of downstream behavior and cognition. For instance, incremental theorists are more committed to their learning goals and are more persistent in the face of adversity than people who think their intellectual abilities are fixed. A recent study of dieters found that people who hold incremental theories of obesity adopt qualitatively different strategies for losing weight compared to those who hold an entity theory of obesity. Consistent with prior research, incremental theorists were much more open to changing their lifestyle to embrace a new diet, implement a novel exercise routine, or attend group meetings in the service of achieving their weight-loss goal.

**CHAPTER THREE**

**RESEARCH METHODOLOGY**

**3.1 INTRODUCTION**

 In this chapter, we described the research procedure for this study. A research methodology is a research process adopted or employed to systematically and scientifically present the results of a study to the research audience viz. a vis, the study beneficiaries.

**3.2 RESEARCH DESIGN**

Research designs are perceived to be an overall strategy adopted by the researcher whereby different components of the study are integrated in a logical manner to effectively address a research problem. In this study, the researcher employed the survey research design. This is due to the nature of the study whereby the opinion and views of people are sampled. According to Singleton & Straits, (2009), Survey research can use quantitative research strategies (e.g., using questionnaires with numerically rated items), qualitative research strategies (e.g., using open-ended questions), or both strategies (i.e., mixed methods). As it is often used to describe and explore human behaviour, surveys are therefore frequently used in social and psychological research.

**3.3 POPULATION OF THE STUDY**

 According to Udoyen (2019), a study population is a group of elements or individuals as the case may be, who share similar characteristics. These similar features can include location, gender, age, sex or specific interest. The emphasis on study population is that it constitute of individuals or elements that are homogeneous in description.

 This study was carried out to examine obesity and it implications among rural adult. Selected residents of Uyo Local Government in Akwa Ibom State form the population of the study.

**3.4 SAMPLE SIZE DETERMINATION**

A study sample is simply a systematic selected part of a population that infers its result on the population. In essence, it is that part of a whole that represents the whole and its members share characteristics in like similitude (Udoyen, 2019). In this study, the researcher adopted the convenient sampling method to determine the sample size.

**3.5 SAMPLE SIZE SELECTION TECHNIQUE AND PROCEDURE**

According to Nwana (2005), sampling techniques are procedures adopted to systematically select the chosen sample in a specified away under controls. This research work adopted the convenience sampling technique in selecting the respondents from the total population.

In this study, the researcher adopted the convenient sampling method to determine the sample size. Out of all the entire population of residents of Uyo Local Government in Akwa Ibom State, the researcher conveniently selected 80 out of the overall population as the sample size for this study. According to Torty (2021), a sample of convenience is the terminology used to describe a sample in which elements have been selected from the target population on the basis of their accessibility or convenience to the researcher.

**3.6 RESEARCH INSTRUMENT AND ADMINISTRATION**

The research instrument used in this study is the questionnaire. A survey containing series of questions were administered to the enrolled participants. The questionnaire was divided into two sections, the first section enquired about the responses demographic or personal data while the second sections were in line with the study objectives, aimed at providing answers to the research questions. Participants were required to respond by placing a tick at the appropriate column. The questionnaire was personally administered by the researcher.

**3.7 METHOD OF DATA COLLECTION**

Two methods of data collection which are primary source and secondary source were used to collect data. The primary sources was the use of questionnaires, while the secondary sources include textbooks, internet, journals, published and unpublished articles and government publications.

**3.8 METHOD OF DATA ANALYSIS**

The responses were analysed using the frequency tables, which provided answers to the research questions.

In analyzing one of the data collected, a mean score was used to achieve this. The four-point rating scale will be given values as follows:

SA = Strongly Agree 4

A = Agree 3

D = Disagree 2

SD = Strongly Disagree 1

**Decision Rule:**

To ascertain the decision rule; this formular was used

|  |
| --- |
| 4+3+2+1 =10**= 2.5** 4 4 |

Any score that was 2.5 and above was accepted, while any score that was below 2.5 was rejected. Therefore, 2.5 was the cut-off mean score for decision taken.

**3.9 VALIDITY OF THE STUDY**

Validity referred here is the degree or extent to which an instrument actually measures what is intended to measure. An instrument is valid to the extent that is tailored to achieve the research objectives. The researcher constructed the questionnaire for the study and submitted to the project supervisor who used his intellectual knowledge to critically, analytically and logically examine the instruments relevance of the contents and statements and then made the instrument valid for the study.

**3.10 RELIABILITY OF THE STUDY**

The reliability of the research instrument was determined. The Pearson Correlation Coefficient was used to determine the reliability of the instrument. A co-efficient value of 0.68 indicated that the research instrument was relatively reliable. According to (Taber, 2017) the range of a reasonable reliability is between 0.67 and 0.87.

**3.11 ETHICAL CONSIDERATION**

The study was approved by the Project Committee of the Department. Informed consent was obtained from all study participants before they were enrolled in the study. Permission was sought from the relevant authorities to carry out the study. Date to visit the place of study for questionnaire distribution was put in place in advance.

**CHAPTER FOUR**

**DATA PRESENTATION AND ANALYSIS**

**INTRODUCTION**

This chapter presents the analysis of data derived through the questionnaire and key informant interview administered on the respondents in the study area. The analysis and interpretation were derived from the findings of the study. The data analysis depicts the simple frequency and percentage of the respondents as well as interpretation of the information gathered. A total of eighty (80) questionnaires were administered to respondents of which only seventy-seven (77) were returned and validated. This was due to irregular, incomplete and inappropriate responses to some questionnaire. For this study a total of 77 was validated for the analysis.

**4.1 DATA PRESENTATION**

**Table 4.1: Demographic profile of the respondents**

|  |  |  |
| --- | --- | --- |
| **Demographic information** | **Frequency** | **percent** |
| **Gender**Male |  |  |
| 42 | 54.5% |
| Female | 35 | 45.5% |
| **Age** |  |  |
| 20-29 | 15 | 19.5% |
| 30-39 | 19 | 24.7% |
| 40-49 | 23 | 29.9% |
| 50+ | 20 | 25.9% |
| **Marital Status** |  |  |
| Single  | 10 | 12.9% |
| Married | 64 | 83.1% |
| Separated | 0 | 0% |
| Widowed | 3 | 3.9% |
| **Education Level** |  |  |
| WAEC | 00 | 0% |
| BS.c | 35 | 45.5% |
| MS.c | 42 | 55.5% |
| MBA | 00 | 0% |

**Source: Field Survey, 2022**

**4.2 DESCRIPTIVE ANALYSIS**

**Question 1: What is the level of obesity prevalence among rural adults?**

**Table 4.2:** Mean responses of the level of obesity prevalence among rural adults

|  |  |  |
| --- | --- | --- |
| **Option** | **Frequency** | **Percentage** |
| High level  | 38 | 49.3 |
| Low level  | 17 | 22 |
| Undecided  | 22 | 28.5 |
| Total  | 77 | 100 |

**Source: Field Survey, 2022**

From the table above on level of obesity prevalence among rural adults, 49.3% of the respondents ticked high level, 22% of the respondents ticked low level and 28.5% of the respondents were undecided.

**Question 2: What are the factors that influence overweight and obesity among rural adults?**

**Table 4.3:** Mean responses of the factors that influence overweight and obesity among rural adults

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **ITEM STATEMENT** | **SA****4** | **A 3** | **D****2** | **SD****1** | **X** | **S.D** | **DECISION** |
| 1 | Hereditary  | 32 | 18 | 18 | 09 | 2.9 | 2.9 | Accepted |
| 2 | Pre natal and early life influences | 39 | 18 | 10 | 10 | 3.1 | 2.8 | Accepted |
| 3 | Poor diet | 27 | 21 | 17 | 12 | 2.8 | 2.8 | Accepted |
| 4 | Too litle physical activities  | 42 | 25 | 08 | 02 | 3.4 | 2.9 | Accepted  |
| 5 | Stress and emotional distress | 29 | 18 | 17 | 10 | 2.8 | 2.8 | Accepted  |

**Source: Field Survey, 2022**

From the responses derived as described in the table on the factors that influence overweight and obesity among rural adults, the table shows that all the items (item1-item5) were accepted. This is proven as the respective items (item1-item5) had mean scores of and above 2.50.

**Question 3: What are the health risk factors associated with overweight and obesity among rural adults?**

**Table 4.4:** Mean responses on the health risk factors associated with overweight and obesity among rural adults

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **ITEM STATEMENT** | **SA****4** | **A 3** | **D****2** | **SD****1** | **X** | **S.D** | **DECISION** |
| 1 | Cardiovascular diseases | 39 | 25 | 10 | 03 | 3.3 | 2.8 | Accepted |
| 2 | Type 2 diabetes | 37 | 27 | 08 | 02 | 3.2 | 2.9 | Accepted |
| 3 | High blood pressure | 42 | 28 | 07 | 05 | 3.5 | 2.8 | Accepted |
| 4 | High blood cholesterol | 39 | 25 | 10 | 03 | 3.3 | 2.8 | Accepted  |
| 5 | Certain types of cancers | 37 | 25 | 08 | 02 | 3.1 | 2.9 | Accepted  |

**Source: Field Survey, 2022**

From the responses derived as described in the table on the health risk factors associated with overweight and obesity among rural adults, the table shows that all the items (item1-item5) were accepted. This is proven as the respective items (item1-item5) had mean scores of and above 2.50.

**Question 4: What ways can be used to prevent obesity among rural adults?**

**Table 4.3:** Mean responses on ways that can be used to prevent obesity among rural adults

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **ITEM STATEMENT** | **SA****4** | **A 3** | **D****2** | **SD****1** | **X** | **S.D** | **DECISION** |
| 1 | Engaging in daily aerobic activities  | 32 | 18 | 18 | 09 | 2.9 | 2.9 | Accepted |
| 2 | Eating plenty of dietary fibre | 39 | 18 | 10 | 10 | 3.1 | 2.8 | Accepted |
| 3 | Consuming less processed and sugary foods | 27 | 21 | 17 | 12 | 2.8 | 2.8 | Accepted |
| 4 | Consuming less fatty foods  | 42 | 25 | 08 | 02 | 3.4 | 2.9 | Accepted  |

**Source: Field Survey, 2022**

From the responses derived as described in the table on ways that can be used to prevent obesity among rural adults, the table shows that all the items (item1-item 4) were accepted. This is proven as the respective items (item1-item 4) had mean scores of and above 2.50.

**CHAPTER FIVE**

**SUMMARY, CONCLUSIONS AND RECOMMENDATIONS:**

**5.1 Introduction**

This chapter summarizes the findings into the assessment of obesity and its implications among rural adult. Respondents for this study were obtained from residents of Uyo Local Government in Akwa Ibom State. The chapter consists of summary of the study, conclusions, and recommendations.

**5.2 Summary of the Study**

In this study, our focus was to examine obesity and it implications among rural adult. The study specifically was aimed at examining the level of obesity prevalence among rural adults, identifying the factors that influence overweight and obesity among rural adults, identifying the health risk factors associated with overweight and obesity among rural adults and suggesting ways to prevent obesity among rural adults.

The study adopted the survey research design and randomly enrolled participants in the study. A total of 77 responses were validated from the enrolled participants where all respondent are residents of Uyo Local Government in Akwa Ibom State.

**5.3 Conclusions**

Based on the findings of the study, the researcher concluded that;

1. The factors that influence overweight and obesity among rural adults include;
2. Hereditary,
3. Pre natal and early life influences,
4. Poor diet,
5. Too litle physical activities and
6. Stress and emotional distress.
7. The level of obesity prevalence among rural adults is very high.
8. The health risk factors associated with overweight and obesity among rural adults includes:
9. Cardiovascular diseases,
10. Type 2 diabetes,
11. High blood pressure,
12. High blood cholesterol and
13. Certain types of cancers.

The ways that can be used to prevent obesity among rural adults include:

1. Engaging in daily aerobic activities,
2. Eating plenty of dietary fibre,
3. Consuming less processed and sugary foods and
4. Consuming less fatty foods

**5.3 Recommendations**

Based on the responses obtained, the researcher recommended that;

1. This study can equip stakeholders to make policies that will recognize and address the emerging challenges of childhood overweight and obesity in Nigeria in general during this period of Health Sector Reform.
2. Because obesity, as well as their co-morbidities, will continue to increase the impact of a number of risk factors for adult diseases, it is reasonable and important to raise awareness and knowledge about the prevalence of these disorders in Nigeria, which is still grappling with the public health effects of malnutrition and micronutrient deficiencies.

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**QUESTIONNAIRE**

**PLEASE TICK [√] YOUR MOST PREFERRED CHOICE AND AVOID TICKING TWICE ON A QUESTION**

**SECTION A**

**PERSONAL INFORMATION**

**Gender**

Male [ ] Female [ ]

**Age**

20-29 [ ]

30-39 [ ]

40-49 [ ]

50+ [ ]

**Marital status**

Single ( )

Married ( )

Divorced ( )

Separated ( )

**Educational level**

**NCE/OND** [ ]

BSC/HND [ ]

MSC/PGDE [ ]

**SECTION B**

**Question 1: What is the level of obesity prevalence among rural adults?**

|  |  |
| --- | --- |
| **Option** | **Please tick** |
| High level  |  |
| Low level  |  |
| Undecided  |  |

**Question 2: What are the factors that influence overweight and obesity among rural adults?**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S/N** | **ITEM STATEMENT** | **Strongly****Agree** | **Agree**  | **Disagree** | **Strongly****Disagree** |
| 1 | Hereditary  |  |  |  |  |
| 2 | Pre natal and early life influences |  |  |  |  |
| 3 | Poor diet |  |  |  |  |
| 4 | Too litle physical activities  |  |  |  |  |
| 5 | Stress and emotional distress |  |  |  |  |

**Question 3: What are the health risk factors associated with overweight and obesity among rural adults?**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S/N** | **ITEM STATEMENT** | **Strongly****Agree** | **Agree**  | **Disagree** | **Strongly Disagree** |
| 1 | Cardiovascular diseases |  |  |  |  |
| 2 | Type 2 diabetes |  |  |  |  |
| 3 | High blood pressure |  |  |  |  |
| 4 | High blood cholesterol |  |  |  |  |
| 5 | Certain types of cancers |  |  |  |  |

**Question 4: What ways can be used to prevent obesity among rural adults?**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S/N** | **ITEM STATEMENT** | **Strongly****Agree** | **Agree**  | **Disagree** | **Strongly****Disagree** |
| 1 | Engaging in daily aerobic activities  |  |  |  |  |
| 2 | Eating plenty of dietary fibre |  |  |  |  |
| 3 | Consuming less processed and sugary foods |  |  |  |  |
| 4 | Consuming less fatty foods  |  |  |  |  |