PREVALENCE OF HYPERTENSION AND RISK FACTORS AMONG ADOLESCENT APPRENTICE IN IBADAN NORTH EAST LOCAL GOVERNMENT AREA, OYO STATE

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DEDICATION

I dedicate this research work to my God, the grace giving Father for giving me the grace to accomplish another phase of my educational career. Also to my dearest parents, Elder & Mrs A.A. Akanbi for standing in gap and being the pillar I can lean on at all times. Also to my siblings and nieces, Adefunke, Adeyemi, Adepeju, Oluwasemilore and Oluwadamisi you are indeed the best.

ABSTRACT

Hypertension (HTN) is the commonest non communicable disease affecting both sexes in all races. It is the most prevalent cardiovascular disease risk factor worldwide. It has been shown that HTN seen in children can progress into adulthood thus contributing to the increase in the cardiovascular morbidity and mortality in adults. With globalization bringing more lifestyle modifications, adolescents are exposed to multiple risk factors. This study was therefore designed to determine the prevalence of hypertension and risk factors among adolescent apprentice (AA) in Ibadan North East Local Government Area, Oyo State.

Using a descriptive cross-sectional design, a five-stage sampling technique was used to select 422 consenting respondents from 12 wards, 3 strata (inner core, transitory and peripheral) and 8 communities. A semi-structured interviewer-administered questionnaire was used to collect information which included socio-demographic characteristics of the AA, knowledge of HTN, perception of adolescents and risk factors predisposing to HTN. Blood pressure (BP) was measured twice using mercury sphygmomanometer and the average BP was recorded to determine the prevalence of HTN. Knowledge of HTN was measured on a 32 point scale and perception on an 11 item scale. Knowledge scores of $\leq$11 were rated as poor, between12-22 and >23 were rated as fair and good respectively. Positive and negative perception were categorized on $\geq$5 and <5 scores respectively. Data were analyzed using descriptive statistics and Chi-square test at p = 0.05.

Respondents' mean age was 15.4$\pm$2.7 years. Mean Systolic Blood Pressure (SBP) and Diastolic Blood Pressure (DBP) for males were 107.2$\pm$17.4 mmHg and 65.1$\pm$17.1 mmHg respectively. The mean SBP and DBP for females were 105.6$\pm$18.5 mmHg and 65.4$\pm$15.9 mmHg respectively. The prevalence of HTN was 14.9%. Only 63.5% of the respondents have fair knowledge of HTN. Severe headache (19.1%) had the highest proportions among the signs and symptoms of HTN followed by sleeplessness. Only 38.9% of the respondents' have positive perception. Overall, 45% of the respondents perceived that traditional herbs are better to treat hypertension than western medicines and only 3.1% of the respondents were currently smoking. Among the reasons given for

smoking, 27.5% smoked in order to derive pleasure. Only 22.5% of the respondents had ever taken alcohol. Only 7.1% of those that had ever drunk alcohol were mostly influenced by their co-apprentice/friends. Some (42.2%) of the respondents had inadequate funds to meet their personal needs. Among reported health problem experienced in the last one week before the survey as a result of stress include headache (23.0%), body pain (21.7%) and body weakness (21.6%). All (100%) the respondents had no physical activities facilities in their work place.

The prevalence of hypertension among adolescent apprentice is a cause for concern and majority had fair knowledge and poor perception of hypertension. Health education and early life style modification can help to influence their knowledge, perceptions as well as reduce their risk of developing hypertension at early stage.

Keywords: Hypertension, Prevalence, Adolescent Apprentice, Risk factors.

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Funmilola Adebunmi AKANBI

CERTIFICATION

I hereby certify that this study was carried out by AKANBI, Funmilola Adebunmi in the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan, Nigeria.

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LIST OF ACRONYMS

BAM	Breathing Awareness Meditation
BMI	Body Mass Index
CDPC	Center for Disease Prevention and Control
CVD	Cardio Vascular Diseases
HE	Health Education
IBNELGA	Ibadan North East Local Government Area
LS	Life Skills training
NCD	Non-Communicable Diseases
UNFPA	Unite Nations population funds
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Hypertension is regarded as a major public health problem (Murray and Lopez, 1997). Emerging evidence identifies hypertension as a major cause of morbidity and mortality (Cappucio et al., 2004; Rufus et al., 2008). It is the commonest non communicable disease affecting both sexes in all races. It is the most prevalent cardiovascular disease risk factor worldwide. It has been shown that hypertension seen in children can progress into adulthood thus contributing to the increase in the cardiovascular morbidity and mortality in adults.

Hypertension is a common disease associated with high mortality and morbidity and it is a leading cause of the burden of disease worldwide. More than one third of the world's deaths can be attributed to a small number of risk factors. The five leading global risks for mortality in the world are high blood pressure, tobacco use, high blood glucose, physical inactivity and obesity (WHO, 2011).

Hypertension is a known public health problem in adults, but much less appreciated in childhood and adolescents. There are indications that the burden of non-communicable diseases (NCDs) such as hypertension is increasing in epidemic proportions in Africa. Many studies on hypertension worldwide have been on middle aged and elderly patients giving the impression that hypertension is a disease of those age groups. The astonishment and disbelief with which young individuals react to the diagnosis of hypertension is a pointer to this assertion (Shyam, Mohammed, Kamlech and Kalyan, 2008). The risk of developing hypertensive cardiovascular complications is greater in younger than in older individuals (Juhasz, Katona, Settakis, Paragh, Molnar, Fulesdi, and Pall, 2010). Many studies on hypertension worldwide have been on middle aged and elderly patients giving the impression that hypertension is a disease of those age groups. The increasing incidence of non communicable diseases will lead to greater dependency and mounting costs of care for patients and their families unless public health efforts to prevent conditions that are intensified.

Thus, early detection of hypertension and its precipitating or aggravating factors are important if one is to evolve measures so that complications of hypertension can be prevented. Hypertension could have its origin in childhood and go undetected unless specially looked for during this period. With globalization bringing more lifestyle modifications, adolescents are exposed to multiple risk factors including obesity, diet, academic stress, lack of physical work apart from hereditary risk factors. Early diagnosis of hypertension is an important strategy in its control, effective treatment and prevention of complications (Jasmine, Joseph, Adaikalam, Parameswari, Valarmarthi, Kalpana and Shantharam, 2013).

1.2 Statement of the Problem

Adolescents constitute one third of the world's population of 6.3 billion people (UNFPA, 2003). Hypertension accounts for 9.4 million deaths worldwide every year (Lim, Vos, Flaxman, Danaei et al., *1990-2010*). The disease is a silent threat to the health of people all over the world. It is suggested that hypertension has its origin in childhood but goes undetected unless specifically looked for during this period.

As early as 1990, hypertension was reported among Nigeria children in Ile-Ife Osun State with a prevalence of 4 % by Balogun et al., and another study conducted in Enugu among secondary school students by (Ejike, Ugwu, Ezeanyika and Olayemi, 2008), a prevalence of 5.4% of hypertension was found among 146 adolescents age 10-18 years. The data shows hypertension is increasing among adolescents. It was suggested that hypertension is wide spread among adolescent population and the extent to which this occurred in that population is yet to be empirically validated.

1.3 Justification

Most lifelong health-related behavior is established during adolescence. With globalization bringing more lifestyle modifications, adolescents are exposed to multiple risk factors related to hypertension such as tobacco consumption, alcohol consumption, stress, poor dietary intake, insufficient physical activities (WHO, 2011). It is also a serious warning sign that significant lifestyle changes will be urgently needed. Therefore, this research has yielded useful baseline information on adolescent's blood pressure,

body mass index, knowledge, perception and risk factors among adolescent apprentice in Ibadan North East Local Government, Oyo State, Nigeria.

This information is useful for program officers working at the Local government and State level for implementing intervention programs for adolescents in the Local Government Area. The results are useful for policy obialogue and inclusion in the current adolescent policy. The study had provided answers to the following research questions.

1.4 Research Questions

1. What is the prevalence of hypertension among adolescent apprentice in Ibadan North East Local Government?
2. What is the level of knowledge of adolescent apprentice in Ibadan North East Local Government on hypertension?
3. What is the perception of adolescent apprentice in Ibadan North East Local Government on hypertension?
4. What are the risk factors predisposing adolescent apprentice in Ibadan North East Local Government to hypertension?

1.5 Broad Objective

The broad objective of this study was to investigate the prevalence of hypertension and risk factors among adolescent apprentice in Ibadan North East Local Government Area, Oyo

1.5.1. Specific Objectives

The specific objectives of this study were:

1. To determine the prevalence of hypertension among adolescent apprentice in Ibadan North East Local Government.
2. To assess the knowledge of adolescent apprentice in Ibadan North East Local Government on hypertension.
3. To document the perception of adolescent apprentice in Ibadan North East Local Government on hypertension.
4. To determine the risk factors predisposing adolescent apprentice in Ibadan North East Local Government to hypertension.

1.6. Research Hypothesis

1. There is no association between age and knowledge of adolescent apprentices on hypertension.
2. There is no association between sex and knowledge of adolescent apprentices on hypertension.
3. There is no association between level of education and knowledge of adolescent apprentices on hypertension.

CHAPTER TWO
LITERATURE REVIEW

2.1. The Global Burden of Hypertension

The global burden of diseases and associated risk factors has changed significantly over the past two decades with a clear shift from communicable to non-communicable diseases (Lim et al 2012). Most notably, high blood pressure has been ranked as the number one contributing factor to the global burden of non-communicable disease, as it is an important and highly prevalent risk factor for both cerebrovascular and cardiovascular disease, (National High Blood Pressure Education Program, 2004)

Brookes has postulated that approximately 1 in 3 adults aged over 20 years will have hypertension by the year 2025 and that almost three-quarters of the world's hypertensive population will be in economically developing countries. (Brookes, 2005). Ari and Raymond in 2005, described blood pressure as a major determinant of health in adult life and that it is significantly determined by both genetic and lifestyle factors. Blood pressure can be low (hypotension) or high (hypertension).. It is classified as normotensive if diastolic blood pressure is less than 90 mmHg, as borderline hypertension if systolic blood pressure ranges between 140 and 159 mmHg, and as sustained hypertension if systolic blood pressure is greater than or equal to 160 mmHg and diastolic blood pressure is greater than or equal to 95 mmHg (Jonathan, Brian Karen, Paul and Richard, 2007).

In many studies, hypertension in children and adults has been linked to the increasing prevalence of obesity worldwide by many studies. Barbara et al (2005) have shown that fat located in the abdominal region is associated with greater health risks than that in the peripheral regions. Another study also revealed that on the heart and blood vessels even with mild hypertension. Factors that seem to contribute to primary hypertension in adults and possibly in children include high blood cholesterol levels, Overweight, Inactivity, Smoking and excessive consumption of salt. Secondary causes of hypertension in children include diseases of the kidney kidneys play an important role in regulating blood pressure and often have diminished ability to perform this vital task when they are diseased. A congenital heart defect called coarctation of the aorta may also cause high blood pressure readings. Head injury may raise the pressure inside the brain, which affects the body's ability to regulate blood pressure normally. Use of prescribed or illegal

recreational drugs (such as steroids taken to decrease inflammation, oral contraceptives or cocaine) leads to high blood pressure (Lucile Packard Children's Hospital, 2006).

If a secondary cause has been found, such as kidney disease, the underlying disease will be treated. If no cause has been determined the first treatment approach is lifestyle therapy, which includes weight reduction, increasing physical activity, healthy diet, cut down on salt and alcohol: Many children eat more than the recommended daily amount of salt in their diet, two of the main contributors to this are the salt found in processed foods (for example ready meals and crisps) and salt that is added while cooking, stop smoking, stress management or relaxation therapy. The increasing prevalence of hypertension is attributed to population growth, ageing and behavioral risk factors, such as unhealthy diet, harmful use of alcohol, lack of physical activity, excess weight and exposure to persistent stress. It is dangerous to ignore high blood pressure, because this increases the chances of life-threatening complications. The higher the blood pressure, the higher the likelihood of harmful consequences to the heart and blood vessels in major organs such as the brain and kidneys. This is known as cardiovascular risk, and can also be high in people with mild hypertension in combination with other risk factors (WHO, 2013).

2.2. The Burden of Hypertension in Nigeria

Nigeria has a population of 120 million people and is the largest Black nation in the world. The crude prevalence of hypertension has been documented as 11.2% (based on blood pressure threshold of 160/95 mm Hg), with an age-adjusted ratio of 9.3%. This number translates into <4.33 million Nigerian hypertensive's aged ≥15 years (according to the latest national census figure), (Akinkungbe, 1997). However, according to the current definition of hypertension from the seventh Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7, 2003) guidelines, many more Nigerians (20%–25%) would be classified as hypertensive. In a study carried out by the International Collaborative Study of Hypertension in Blacks (ICSHIB), the age-adjusted prevalence of hypertension in Nigeria was 14.5% (14.7% for men and 14.3% for women) (Cooper R. et al., 1997). Major target-organ complications of hypertension, such as left ventricular hypertrophy, diastolic dysfunction, congestive heart failure, ischemic heart disease, stroke, and renal failure are well documented by various researchers in Nigeria (Opadijo and Ike, 2003).

In a study of cardiovascular diseases in multiple centers in Nigeria, hypertension was ranked first. Hypertension and its complications constitute ≈25% of emergency medical admissions in urban hospitals in the country (Ekere, Yellowe and Umune, 2005). It is the medical illness most frequently diagnosed in elderly Nigerians. In 2001, Ogunniyi et al. studied 613 elderly Nigerians (398 women and 215 men) aged 65–110 years in a cohort at Ibadan. They reported that cardiovascular disease is the most common condition in this cohort, and hypertension (27.8%) was the most frequent diagnosis. Bella et al., I993 also reported a similar figure. High blood pressure is also the most common condition associated with dementia in Nigeria. It is the most common condition in senior executives (Okojie, Isah and Okoro, 2000) and army recruits (Owoyemi, 2001). Two autopsy studies have shown that hypertension is the most common cause of sudden unexpected natural death. Amakiri et al., 1997 studied 876 consecutive coroners' autopsies at Ibadan and found that the most common cause of sudden natural death was cardiovascular disease, and complications of hypertension accounted for most cases. This finding was corroborated by Aligbe et al, 2002, that 3% of hypertensive Nigerians dies each year.

2.3. Prevalence of Hypertension among Adolescent

In a Study conducted in Ile-Ife Osun State by Balogun et al., (1990), reported a 4% prevalence of hypertension among Nigerian children. This is an indication that hypertension among school-age pupils in Ile-Ife, Nigeria is on the increase.

Supreet Kaur *et al.*, (2005) in an epidemiological study on school children in Delhi found that prevalence of hypertension (systolic, diastolic or both) was 11.9% in boys and 11.4% in girls (Supreet Kaur *et al.*, 2005). On comparison it is seen that the present study has reported lower percentage of hypertension. Bishav Mohan *et al.*, (2004) conducted a study on Prevalence of Sustained Hypertension and Obesity in Urban and Rural School Going Children in Ludhiana (India). The prevalence of sustained hypertension in urban population between ages 11-17 years was 6.69% where as the results of the present study revealed lesser percentage of hypertensive students. According to the same study mentioned above by Bishav et al., (2004) prevalence of sustained hypertension in rural population, in similar age group was 2.56%. In both urban and rural areas, the number of hypertensive males was more. However the difference between the two sexes is statistically significant in urban population ($P< 0.05$). (Bishav et al., 2004). Where as in

the present study number of hypertensive males are more as reported by Bishav et-al, but the difference between the two sexes is not statistically significant (P = 0.09).

Also, in a study conducted in Enugu among secondary school adolescents between the ages of 10 and 18 in 2013, the prevalence of hypertension in the study population of 146 adolescents was 5.4%. Among these 97 (6.9%) were females and 49 (3.8%) were males. Among the hypertensive adolescents, 99 subjects (67.8%) were classified as stage I while 47 subjects (32.2%) had stage II hypertension. About 77.3% of the subjects had normal blood pressure values while 467 (17.3%) had pre-hypertension. The prevalence rate of pre-hypertension in males and females were 14.3% and 20.01% respectively $p < 0.01$. Nevertheless the observed prevalence rate falls within the documented prevalence rate of adolescent hypertension of 1-13% in Nigerian adolescents (Ejike, Ugwu, Ezeanyika and Olayemi, 2008)

2.4. Risk factors for Hypertension among adolescents

Increasing trends of non-communicable diseases is a worldwide phenomenon. According to the Executive summary of the Global Burden of Disease Study, 2006 Globally, deaths from non communicable diseases are expected to climb to 49.7 million in 2020, an increase of 77% in absolute numbers and increase in their share of the total from 55% in 1990 to 73% in 2020. Until now risk factors like high blood pressure, obesity, smoking, alcohol consumption, low physical activity etc. contributing to the development of non-communicable diseases were more prevalent in the developed countries. However, the "World Health Report 2002,: reducing risks, promoting healthy life", indicates a rise in their prevalence even in the developing countries (De Onis and Blossner. 2000).

2.4.1. Tobacco consumption

Cigarette consumption among adolescents is a large public health problem around the world. Globally, WHO estimates that about 5 million people die yearly from tobacco use (Makomaski, Illing and Kaiserman, 2004). It is projected that over the next 50 years about 450 million deaths would be caused by tobacco use (Peto and Lopez, 2001). Rates of smoking have declined in the developed world (CDCP, 2009) while in the developing world, tobacco consumption is rising by 3.4% per year (WHO, 2002). It is predicted that 1.5 to 1.9 billion people will be smokers in 2025 (Guindon, Emmanuel, Boisclair and David, 2003), and by 2030 if current trends continue smoking will kill one in six people

while someone will die from tobacco consumption every eight seconds (WHO, 2012) and about 250 million of these future smokers will be killed by smoking (Charlton, Moyer, Gupta and Hill, 2009).

According to a study conducted by Okafor N, 1992 among adolescents between the ages of 10-20 years, in Lagos, 11.4% had ever smoked cigarette, 2.1 % are currently smoking and 88.6% are non-smokers

The data expressed in the research conducted among middle school students in Brazilian Southeast border on current global statistics indicating 9.5% of smoking among students and that one in every ten students consumes tobacco-related products different from cigarettes, like cigars and chew tobacco (Warren et al., 2008)). Results similar to the present study were observed in another sample of Brazilian adolescents between 12 and 14 years of age, in which it was verified that 5.3% had smoked at least one cigarette per week during the month before the assessment (Lima-Costa, Peixoto and Firmo, 2004).

Statistics showed that about 90% of smokers start before age 18 (Charlton et al., 2009). In Nigeria, there is overall low proportion of students currently smoking cigarettes with rates highest in Kano (6.2%) and lowest in Lagos (2.6%) (GYTS, 2002) and the prevalence of tobacco smoking among Nigerian youth is 18.1% (Ehizele, Azodo, Umoh and Akinboboye, 2009). Teenagers who smoke are often lifetime smokers, exposed to early addiction, early risk of lung cancer, cardio vascular diseases and pulmonary Diseases (Report of the Surgeon General, 2012).

2.4.2. Alcohol consumption

According to Oxford Advanced Learners Dictionary (1990), alcohol is a colorless liquid contained in drinks such as beer, wine and spirits that can make people drunk. By pharmacological definition, alcohol is a drug classified commonly as sedative, tranquilizer, hypnotic or anesthetic upon the quality (EMDEX2008/2009). Globally, 2 billion people over the world consume alcoholic drinks. Cigarette smoking is spreading to younger age groups and teenage indulgence as a habit is becoming a daily sight. Cigarette smoking has been said to be a problem of the developed countries but recently it is considered a problem in Africa because of the swift in prevalence in the past few years (Okafor, 1992).

In Nigeria, the prevalence of smoking was 22.6% (Obot, 1990). Among cigarette smokers, 60.6% smoked half a pocket a day, male more than females. The poor

uneducated respondents smoked more than relatively rich and educated. Elegbeleye and Femi-Pearse, 1976 reported a prevalence rate of 4.0% for boys and 8.4 % for girls in secondary schools in Lagos. However, Odebiyi (1980) reported a prevalence of 4.7% among secondary school students of Ibadan.

According to a study conducted in Enugu among secondary school adolescents by Ujunwa et al., 2013, Alcohol consumption was noted among 1035 (38.4%) of the study population. Significant daily intake of alcohol was noted among 2.2% of those that consumed alcohol while 92.3% had no significant intake. Alcohol intake was noted more among the males than the females (611 males and 424 females' $p < 0.01$). Finally, smoking was rampant in the third decade of life.

2.4.3. Obesity

Obesity is a global health concern. The increasing prevalence of overweight, obesity and its consequences prompted the World Health Organization to designate obesity as a global epidemic. Increase in the prevalence of overweight among children has taken place over the past twenty years in developing countries such as Nigeria, India, Mexico, and Tunisia. WHO (2013), considers childhood obesity as "one of the most serious public health challenges of 21st century" It accounts for a wide range of psychosocial and medical consequences (Lee, 2009). Lower self-esteem, social isolation, poor academic achievement and peer problems are the most apparent immediate consequences in obese children (Dietz, 1998).Obesity in children and adolescents predisposes them to and is causally linked with cardio-metabolic disorders such as hypertension, dyslipidaemia and insulin resistance which are well-established illnesses (Reilly, 2005).

Childhood obesity has become a severe health problem, especially during the last few decades (Bouchard, 2000). Therefore, the increasing numbers of obese children and adolescents all over the world demand an investment in the primary and secondary prevention of obesity and overweight in this age group (Dietz, 2001).

Hypertension has been demonstrated in several populations to have a positive correlation with obesity and overweight, with obese children having a 3-fold increased risk of developing hypertension compared with their non-obese counterparts (Agyemang, Redekop, Owusu-Dabo and Bruijnzeels, 2005). This is believed to be partly responsible for the rising incidence of childhood hypertension worldwide. Persistent childhood

hypertension is often predictive of future adult hypertension, cardiovascular disease and early death (Chen and Wang, 2008).

According to a study by Oduwole, Ladapo, Fajolu, Ekure and Adeniyi, 2012 conducted in Lagos on obesity and elevated blood pressure among adolescents, there were 400 males and 485 females giving a male: female ratio of 1:1.21, and the age range was 9–18 years (mean 13.04 ± 1.92). Mean age, BMI, and DBP of both sexes were similar (P = 0.98, 0.10, 0.23, respectively), while their mean weights, heights and SBP were significantly different (P < 0.05), the females being heavier and the males taller. There were 209 (23.2%) pupils with BMI above the 85th percentile for age and sex, 124 of whom were overweight and 85 were obese, giving prevalence rates of 13.8% and 9.4%, respectively. It reflects a higher prevalence of both overweight and obesity in females than males. The high prevalence of overweight and obesity observed in this study is alarming especially when compared with the prevalence in a small number of previous reports from comparable locations, which ranged from 0.3% to 5% (Ansa, Odigwe and Anah, 2001). More importantly, it is unclear if increased physical activity can protect overweight youth from progressing to high blood pressure, the most prevalent chronic illness associated with childhood obesity (Jago et al 2006).

2.4.4. Stress

Among the numerous medial diseases, syndromes and disorders that confront modern medicine, essential hypertension stand out as a disorder that is commonly associated with stress and living a stressful life. Even the term “hypertension” suggests a close linkage of this disorder to stress and tension rather than its more accurate description of elevated arterial pressure with the circulatory system (Davidyan, 2010). Stress does not directly cause hypertension but can have an effect on its development, Life stress plays an important and significant role in the onset and progression of cardiovascular disorders especially hypertension (Fisher, 1996). From the results it can be said that hypertensive patients suffer from higher level of stress. Similar findings have been also obtained by Fauvel (2002). In a study they found that stress was independently related to blood pressure especially in active people.

Lazarus, 1966 proposed that stress is the internal state of an individual who perceives threats to his or her physical or psychic well-being. As such, an appropriate measure of

stress should include some assessment of the individual's perception of each event or situation. Additionally, when attempting to study stress and its effects on health, there has been controversy over whether to focus on major life events or smaller, more chronic events. Studies of major life events have only been able to account for a small portion of the variance in the development of physical and psychological symptoms (Wagner, Compas and Howell, 1988). In contrast, daily hassles which are stressors experienced in everyday life, have been found to be a better measure of the stress experienced by adults (DeLongis, Coyne, Dakof, Folkman and Lazarus 1982). In support of this assertion, DeLongis et al. noted that daily hassles accounted for a greater percentage of the variance in overall health status. It has also been postulated that major events and daily hassles may operate interactively (Lazarus, 1966).

2.4.5. Physical Inactivity

Physical activity is defined as any bodily movement produced by skeletal muscles that result in energy expenditure. Physical activity includes work-related, recreational, and leisure-time activity (Caspersen, Powell and Christenson, 1985). Regular physical activity is an essential component of personal and public health programs and is associated with reduced risk for specific health problems and lower all-cause mortality (Powell, Caspersen, Koplan and Ford, 1989). Adolescents who perform regular physical activity consistently have a healthier cardio respiratory fitness profile and greater functional capacity than their more sedentary peers (Powell et al,. 1989). Regular physical activity in children also is associated with the maintenance of good mental health and self-esteem (Marinek, Cheffers and Zaichkowsky, 1978). These outcomes of physical activity are associated with improved psychological and emotional functioning that may be carried into adulthood (Ross and Hayes, 1988). Physical activity may result in adverse health outcomes including injuries, myocardial infarction, and sudden cardiac death (Koplan, Siscovick, and Goldbaum, 1985). Risk of injury is related to the intensity, frequency, and duration of exercise. The exercise setting also is important. Some types of physical activity - such as walking, jogging, and bicycling that may be performed near motor vehicles are more likely than other types of exercise to be associated with serious injury. Previous injury is the most important determinant of subsequent injury. Injuries occurring during youth can have serious implications for functional health status in adulthood (Macera, et al., 1989).

Physical inactivity and sedentary lifestyles contribute to obesity and may be fundamental sources of energy imbalance (Goran, Reynolds and Lindquist, 1999). It also predisposes an individual to other metabolic abnormalities and may thereby ultimately lead to metabolic syndrome. The assessment of physical activity in childhood and adolescence is a complex task, hampered by methodological difficulties, since these measures vary in the specificity of their assessment of mode, frequency, intensity, and duration of activities as well as the cultural context (Sallis and Saelens 2000). According to Must and Tybor, 2005 previous studies showed that increased physical activity and decreased sedentary behavior were protective against relative weight and fatness gains over childhood and adolescence. It is suggested that physical inactivity may be one of the main modifiable risk factors in the etiology of the common complex metabolic disorders (Leon, 1997). Interventions for increasing physical activity have been widely recommended and are essential in reversing the increasing trend of obesity. Although it is well established that the incidence of overweight increases and physical activity declines as much as 50% during adolescence, few studies have examined the role of physical activity in preventing obesity and related metabolic disorders among young people (Kimm, Glynn and Kriska, 2002).

According to a study by Mane, Agarkhedkar, Karwa, Pande, Singhania and Karambelkar, 2012 conducted among adolescents in western India, a total of 200 students from urban area of Pimpri - Chinchwad Municipal Corporation were included in this study. Out of that 100(50%) were boys and 100(50%) were girls showing equal distribution of age, sex and socioeconomic status in the age group of 15 to 18 years of age. About 40% of adolescents responded as being physically active and doing strenuous exercise for more than three hours per week. Boys (54%) were seen to be more physically active and doing heavy exercise than girls (25%). Further the overall level of participation in physical activity is low. This can be explained on the basis that teenagers were spending more time in front of television; computer and video games.

Another reason might be unavailability of playgrounds in the nearest vicinity. The observed gender difference in physical activity matches with the study of Jayant, Notani, Gualti and Gadre, 1991 from India. They reported males (45.5%) and females (30.7%) to be physically active. Girls spend more time in watching television and feel shy or awkward while participating in outdoor activities.

2.5. Knowledge of Hypertension among adolescents

Knowledge is an important pre-requisite for implementing the various preventive strategies for Hypertension and its risk factors. For behavioral change to occur, an individual must be aware of the potential negative consequences of his or her current actions. The Health-Belief-Model (HBM) suggests that a person must feel susceptible to the disease in order to change his or her behavior (Jones et al., 2006). Knowledge of the risk factors of the disease is essential for a person to make an informed decision about engaging in or continuing certain behaviors that may increase disease risk, such as smoking, not exercising or consuming high fat foods (Homko et al., 2008).

Childhood hypertension is less common and not known to occur by the general population when compared to adult hypertension. The morbidity and mortality burden of adult hypertension is definitely more significant and quite tremendous when compared to childhood hypertension (Norwood, 2002). However, it has been observed that the prevalence of childhood hypertension is on the increase especially among the adolescents (Gauthier and Trachtman, 1994). In many parts of the tropics, it is not routine to check the blood pressure in children partly because the instrument is not available and possibly too because of this notion that it is not the major problem in children (Adedoyin and Adeniyi 2001).

2.6. Perception of hypertension and risk factors among adolescents

Hypertension has become a significant problem and contributor to other cardiovascular diseases (CVD) in many developing countries experiencing epidemiological transition (Reddy, 1993). Moreover, recent research indicated that low socio-economic communities are not exempted from the risk of hypertension (Reddy, Naik and Prabhakaran, 2006). The socio-economically disadvantaged communities like migrants in large cities are vulnerable to hypertension (Kusuma, Gupta and Pandav, 2008). In this context, there is an urgent need for prevention and control of hypertension (Reddy et al, 2006). It is not known how the community perceives and views the problem of hypertension.

Hence, understanding the lay beliefs and perceptions are important as prevention and control of chronic conditions such as hypertension requires lifelong adoption of healthy lifestyles. Also, they are important in identifying and bridging the gap between the people and health care providers.

2.7. Interventions for addressing hypertension

Emerging evidence indicating the presence of significant risk of cardiovascular disease in the adolescent population demonstrates a need for comprehensive and effective intervention programs. Surveys that focus on the health behaviors of adolescents indicate that nutrient intake does not meet recommended guidelines, fitness levels are compromised, and substance abuse is not unusual.

According to a study conducted by Wright, Gregoski, Tingen, Barnes and Treiber, 2012 on Impact of Stress Reduction Interventions on Hostility and Ambulatory Systolic Blood Pressure in African American Adolescents among 1,698 students who would be participating in a semester-long ninth-grade Health education class. The following are the interventions carried out among the adolescents.

- Behavioral interventions

Health/physical education teachers conducted the 12-week behavioral interventions during their regular class periods. Interventions were conducted across two high schools by six health/physical education teachers. The students taking these classes did not take physical education during that term. In each school, one teacher was randomly assigned per semester to teach an intervention and was provided supervised training by program instructors. Each teacher was certified by the program instructors as being competent to teach, and qualitative assessments of the teachers' implementations of the programs were conducted on a weekly basis using Likert-type scale ratings (of 0-4) for thoroughness, class attentiveness, and enthusiasm. A score of 3 or 4 was used as the criterion.

- Breathing awareness meditation (BAM)

BAM is the primary exercise in the Mindfulness- Based Stress Reduction Program (Kabat-Zinn and Hanh, 1990). Practice involves focusing on the moment, sustaining attention on the breathing process, and passively observing one's thoughts. The individual sits upright in a comfortable position with the eyes closed and focuses on the movements of the diaphragm while breathing in a slow, deep, relaxed manner. Each weekday, 10-minute sessions were conducted during the HE classes. The subjects were instructed to practice a 10-minute session at home each weekday and twice daily during the weekends. BAM home practice compliance was 86.6 ± 7.4% by self reports. Average in-school attendance for participants receiving the BAM treatment was 91%.

- Health education (HE)

HE lessons were conducted on a weekly basis and consisted of 50- minute sessions on CV-health-related lifestyle behaviors that were based on National Heart, Lung and Blood Institute (NHLBI) guidelines for youth (National High Blood Pressure Education Program Working Group on Hypertension Control in Children and Adolescents, 1996). Brochures, handouts, videotapes, discussions, and recommendations for increasing physical activity (e.g., walking, sports), and establishing and maintaining a prudent diet (e.g., reducing fat and sodium intake) were a part of the program. Average in-school attendance for members receiving HE treatment was 95%.

- Life skills training (LS)

The 50-minute sessions were conducted on a weekly basis using selected components of Botvin Life Skills Training (Botvin, 1998), which included passive and active modeling, group discussions, behavioral homework assignments, feedback, and behavioral rehearsal and reinforcement. The selected program components provided training in problem-solving skills, reflective listening, conflict resolution, and anger management to enhance social skills, assertiveness, and personal and social competence (Botvin, Baker, Renick, Filazzola, and Botvin, 1984). Average in-school attendance for the members receiving the LS group treatment was 93%. There were no relaxation or stress reduction techniques taught in the LS or HE sessions.

Wright et al., findings indicated that the BAM and LS interventions resulted in significant reductions in self-reported hostility, which occurred at different evaluation points. Little change in hostility levels were observed for those in the HE intervention. The BAM intervention resulted in significant reductions in self-reported hostility post-intervention, whereas the LS group exhibited significant declines in hostility from post-intervention to follow-up evaluation. One possible explanation for these findings is that the LS training requires the entire 12 weeks to develop the various hostility-related coping skills, including anger management, reflective listening, effective assertiveness without aggressiveness, and so forth. With the BAM intervention, one learns the stress reduction techniques within the first day or two of practice. The fact that LS shows promise as an intervention tool for reducing hostility is in line with other school-based studies that have found LS training to be a useful tool for youth who have problematic behaviors (e.g., substance abuse conduct or behavioral problems), especially inner-city youth (Botvin et al., 1984; Botvin, Eng, and Williams, 1980; Botvin et al., 1997; Botvin & Griffin, 2002).

The HE findings support Yahav and Cohen's (2008) speculation that hostility reduction may only occur when one is taught specific skills for dealing with hostility. However, the BAM findings do not support this contention because, as in the HE program, no specific hostility or anger management skills training were provided during the intervention. Measures of 24-hour SBP and HR were affected by changes in self-reported hostility within treatment groups. In the BAM group, reductions in self-reported hostility from pre- to post intervention were associated with reductions in 24-hour SBP and HR. Even though there were slight increases in hostility from post-intervention to follow-up evaluation for participants who received training in BAM, those who continued to show declines in hostility levels also showed continued to have declines in 24-hour SBP and HR. While the magnitude of the decrease in 24-hour SBP among the BAM group (i.e., 2.1-2.6 mmHg) may appear modest at first glance, these findings should be viewed within the context of what is known about the natural progression of BP from adolescence to adulthood. Adolescents between the 50th and 95th percentiles have been found to experience a natural increase in 24-hour SBP that ranges from 0.3 to 2.8 mmHg from 15 to 16 years of age (Urbina et al., 2008). Among adults, studies have found that the risk for stroke or coronary mortality doubles with every 20-mmHg increase in SBP throughout the range of SBP (Kannel et al., 2003; Lewington, Clarke, Qizilbash, Peto and Collins, 2002). Therefore, a 2- to 3-mmHg lower SBP maintained from adolescence onward could result in a 12.5% lower risk of stroke- or coronary-related mortality in adulthood. Thus, the magnitude of the change in 24- hour hemodynamic function, if maintained, has considerable implications with regard to reduction of CVD risk.

The HE group exhibited significant relationships between declines in hostility and declines in 24-hour SBP from pre- to post-intervention and from post-intervention to follow-up evaluation. Although the LS group did show a significant decline in hostility from post-intervention to follow-up, no significant associations were observed for any of the 24-hour ambulatory comparisons. This study is the first to examine the impact of three types of behavioral interventions on self-reported hostility and ABP among America Adolescents who are at risk for later development of hypertension. The fact that the participants were not selected for any identified behavioral and anger control problems suggests that the BAM and LS interventions may hold promise in reducing levels of hostility and ABP among all America Adolescents. To our knowledge, this is the first study to suggest that levels of self-reported hostility among the respondents can

be positively affected by breathing meditation or a cognitive behavioral coping skills program implemented by HE teachers as part of the regular curriculum.

While these results are encouraging, they need to be interpreted cautiously until the findings are replicated. For example, there was an overall loss of 29% of the cohort over the course of the 3-month intervention and the subsequent 3-month follow-up. Attrition was to the result of low exposure to the school-based interventions (i.e., 53% of the subject loss was due to the <70% attendance rate), and the remaining sample size loss was due to missing or invalid ambulatory BP data at post-intervention or follow-up evaluation. The low exposure to the school interventions was primarily the result of several of the cohorts across the 4-year period experiencing repeated cessations of classes due to bomb threats and fire alarm activations. Fortunately, every one of these occurrences was a false alert.

A second issue is whether the timings of the changes in hostility by treatment approach are stable. That is, if replicated, there would be implications for conducting BAM for quicker reductions in hostility and ABP, with LS being useful in reducing hostility levels but requiring a longer period of utilization of the learned coping skills. Finally, it is unclear whether LS may result in significant improvements in ABP, which were not detected using only one 24-hour assessment at each evaluation. Situations leading to stressful interpersonal encounters are fairly infrequent. Future studies would benefit from repeated 24-hour ABP evaluations in conjunction with personal digital assistant techniques to monitor the frequency and intensity of anger- or hostility-provoking situations prior to and following the interventions. This information will provide greater clarity regarding the impact of the interventions on such feelings of emotional distress and their associations with ABP variability in the natural environment (Brondolo et al., 2003; Enkelmann et al., 2005). If the present findings are replicated with a larger cohort, it would provide stronger evidence that these interventions could become viable non-pharmacologic approaches for improving both the physical and the emotional health of the respondents. Replication would also strengthen the argument for dissemination of these programs into the regular classroom HE curriculum. The relative low cost and ease of implementation of the programs, especially BAM, leads to their great potential for dissemination in other settings involving youth, such as churches, recreation centers, and so on.

Wright et al., 2012 concluded that if these preliminary findings are replicated, BAM and/or LS may be very useful prevention and intervention approaches to help curb the damaging physical and psychological impacts of repeated exposure to environmental stressors such as unfair treatment, discrimination, community violence, poor and overcrowded school settings, dysfunctional neighborhood and/or family settings, and so forth, often a continued part of the Black experience in the United States.

In 1991in the Republic of Seychelles, a nationwide program was launched to reduce cardiovascular risk factor levels in the population (Gervasoni, Bovet, Shamlaye and Paccaud, 1991; Hungerbuhler, Bovet, Shamlaye, 1993). The program has been mostly targeting the general population and relies on extensive health education through the mass media, inclusion of a heart health education program in the primary school curriculum, and several regulatory measures. Interventions also targeted hypertensive individuals (high-risk strategy) and included, among others, hypertension screenings in public and work places and the organization of primary healthcare–based "heart health clubs," whereby hypertensive patients are offered interactive teaching sessions on cardiovascular risk factor management (Bovet, Shamlaye, Paccaud, 1996).

2.8. Conceptual Frame Work

The conceptual frame work that was used for this study was ecological model. The ecological perspective emphasizes the interaction between factors within and across all levels of health issues. It highlights people's interactions with their physical and socio-cultural environments and its addresses five levels of influence; Intrapersonal factors, interpersonal factors, institutional factors or organizational factors, community factors, and public policy. In order to identify risk factors for the cases of hypertension among adolescent apprentice and this will be used in future to prevent adolescent apprentice in having hypertension and also reduce the prevalence of hypertension amongst them. Instead of blaming the individuals, the environmental influences and lifestyle that leads to the problem are addressed (Brieger, 2002). In this case rather than blaming those that live sedentary life style, environmental influence that increases the prevalence of hypertension are need to be considered.

2.8.1. Intrapersonal factors: The characteristics of the individual such as knowledge, attitudes, behavior, belief about hypertension, age and lifestyle modification etc. This includes the history of the individual.

2.8.2. Interpersonal factors: The influence of significant others was analyzed at this level. This involves relationship with family members, neighbors, masters, co-apprentice, social networks and social support systems, including family, work group and friendship. The attitude and beliefs of families and work place can influence the lifestyles which can predispose to hypertension among the adolescent apprentice.

2.8.3. Institutional factors: This level is very important and necessary for the support of long-term change in lifestyle that predisposes adolescent apprentice and possible adherence to the belief about hypertension. Organizational change is an essential component of creating an organizational culture that will reduce the prevalence of hypertension among the adolescents and lifestyle that predisposes hypertension but the organization of health promotion programs for the adolescent apprentice and other social institutions with organizational characteristics, and formal or informal rules and regulations for operation.

2.8.4. Community factors: Community encompasses groups to which individuals belongs, the relationship among groups or organizations within political and geographical entity determine the opinion of issues among the inhabitants. Relationship among organizations, institutions and informal networks with defined boundaries contributes to the social norms which can influence the lifestyles which can predispose adolescent apprentice to hypertension.

2.8.5. Public policy: Policies and law made at the local level will influence both the prevalence of hypertension and lifestyle practices that predispose adolescent apprentice to hypertension. The Ibadan North East Local Government as well as all Artisans associations' need to make the policy that will ensure provision of health facilities for the prevention and management of hypertension among the adolescent apprentice.

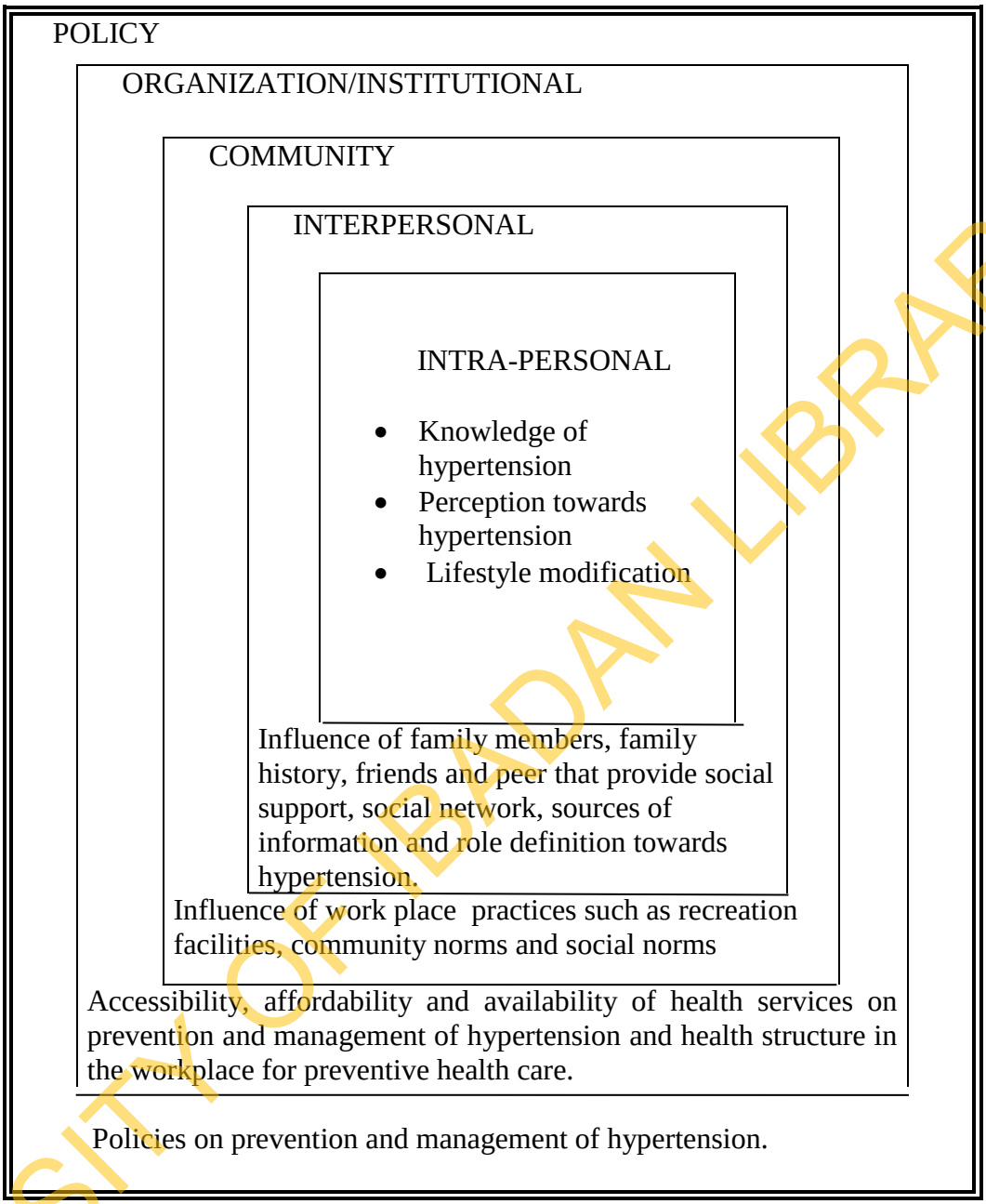

Fig 2.1: Application of ecological Model t***o the risk factors that predisposes Adolescent Apprentice in Ibadan North East Local Government Area to Hypertension.***

CHAPTER THREE

METHODOLOGY

3.1 Study design

A descriptive cross-sectional study design was adopted. It was limited in scope to study the prevalence of hypertension among adolescent apprentice in Ibadan North East Local Government.

3.2 Independent Variables

The independent variable in the study will include the socio-demographic characteristic of the study population such as age, sex, educational qualification and ethnic group of the study population.

3.3 Dependent Variables

The dependent variables of this study are prevalence, knowledge, perceptions and risk factors of the study population.

3.4 Study Setting

Ibadan North East Local Government

Ibadan North East local Government was created on the 29th of August, 1991and has an area of about 15.5 square kilometer. This local government according to year 2006 population census has a total population of about 331,444 (167, 600 females and 163, 844 males). The administrative headquarters is at Agodi, which is one of the major commercial centers in Ibadan land. It is bounded in the East by Egbeda and Ona Ara Local Government, Ibadan North Local Government in the West, while Lagelu and Akinyele share boundary in the North, and bounded by the Ibadan South-East local government in the South. The local government is made up of 12 political wards. Christianity, Islam and Traditional are dominant religions in the locality.

The adolescent apprentices engaged in different social and sedentary lifestyles. They engage in partying and visit bars which prone them to alcohol and cigarette consumption and have no or little time to engage in physical activities.

IBNELGA has different registered artisans associations such as Tailoring, Bricklaying, Shoemaking, Barbing and Hairdressing, Patient medicine vendors, Spare part sellers,

Printing, Aluminum framing, Auto mobile mechanics, Electronics, Carpentry etc. in the Local Government.

3.5 Study Population

The study population consists of all adolescent apprentices in Ibadan North East Local Government Area, Oyo State.

3.6 Inclusion Criteria

Adolescent apprentice in Ibadan North East Local Government who were not mobile, who qualified and consent to be involved in the study.

3.7 Exclusion Criteria

All adolescent apprentices in Ibadan North East Local Government who were mobile (hawkers, motorcyclists, bricklayers etc) and those that refused to participate in the study.

3.8 Determination of Sampling Size

The sample size (n) was determined by using Lwanga and Lemeshow (1991) sample size formula:

$$n = \frac{Z^2 p(1-p)}{d^2}$$

Where n=minimum sample size required

Z= confidence limit of survey at 95% (1.96)

cvP= Proportion of people with hypertension taken at 50.0 % d=absolute deviation from true value (degree of accuracy) = 5%

$$n = \frac{1.96^2 \times 0.50 \times 0.5}{0.05^2}$$

$$n = 384.2$$

approximate = 384

To take care of the possible non response rate, sample size was multiplied by 10% resulting to a total number size of 422.

3.9 Sampling Procedure

For the purpose of the study, the following sampling method was adopted;

Sampling Technique

A multi stage sampling technique involving five stages was used in selecting the respondents for the study.

Step 1: Ibadan North East Local Government Area was stratified into 12 wards. (see table 3.6.1 below)

Step 2: The 12 wards was stratified into 3 groups which are Inner core, Transitory and Peripheral.

Inner core: Ode Aje, Padi, Alase, Aremo, Ajibola

Transitory: Part of Irefin, Agodi gate, Oluyoro, Gbenla, Oke Adu, Aromolaran, Onipepeye

Peripheral: Iwo road, Abayomi, Basorun, Idi ape BCOS Quarters.

Step 3: Three wards were selected by simple random sampling from ward 8, ward 11 and ward 12.

Inner core (ward 8) has 5 communities

Transitory (ward 12) has 7 communities

Peripheral (ward 11) has 4 communities

Total communities = 16 with ratio 1:2:1

Step 4: Using the ratio 1:2:1, 2 communities were selected by simple random sampling in ward 8, ward 11 and 4 communities in ward 12.

Step 5: Qualified and consented respondents were recruited to participate in the study.

Table 3.1 Wards in Ibadan North East Local Government Area

Ward 1: Odo osun, Labiran

Ward 2: Ogbori efon, Ita bale, Oranyan, Beyeruka

Ward 3: Kosodo, Labo, Alafara

Ward 4: Adekile, Aremo, Orita Aperin

Ward 5: Labiran Aderogba, Alafara

Ward 6: Oje Aderogba, Alafara

Ward 7: Oke Offa, Atipe, Oja Igbo, Aremo Alafara, Ajegedi

Ward 8*: Ode Aje, Padi, Alase, Aremo, Ajibola

Ward 9: Koloko, Agugu, Oke Ibadan, Idi Obi

Ward 10: Oke Irefin, Ita Akinloye, Baba Sale, Padi

Ward 11***: Iwo road, Abayomi, Basorun, Idi ape BCOS Quarters

Ward 12**: Part of Irefin, Agodi gate, Oluyoro, Gbenla, Oke Adu, Aromolaran, Oni pepeye

* Inner core

** Transitory

*** Peripheral

3.10 Validity

To ensure the validity of the instruments in terms of expected measures, contents, strength and accuracy, the draft of the questionnaire was developed based on the objectives of the study. It was designed based on literature review then subjected to review by experienced researchers in the field of public health. Thereafter, the draft questionnaire was subjected to peer review and pretested. The key issues that were modified were Occupation of father and mother, Health related stressor experienced in the last three months and Reasons for not engaging in leisure time physical exercise.

3.11 Reliability

In order to determine the reliability of the instruments, a pre-test was conducted among adolescent apprentice in Ibadan South West Local Government Area. The adolescent apprentice in Ibadan South West Local Government Area shares similar characteristics with the adolescent apprentice in Ibadan North East Local Government Area. The pretested questionnaires were cleaned, coded and entered into the computer system. The reliability of the questionnaire was determined using the Cronbach Alpha technique of the Statistical Package for Social Sciences (SPSS) to determine the reliability co-efficient of the questionnaire. According to this approach, a result showing correlation coefficient equal to or greater than 0.5 is said to be reliable. The result from the analysis of the data collected during the pre test showed reliability co-efficient of 0.83 that the instrument is very reliable before proceeding to the main data collection. Few revisions were made on the instruments before they were finally put to use among the adolescent apprentice in Ibadan north East Local Government Area. Revisions included the substitution of a science oriented word to an English word thereafter to Yoruba language but still with the

retention of its meaning for better understanding of the study participants as well as skipping mechanism were also included in the questionnaire.

3.12 Development of Tools

A validated Semi structured questionnaire was used to measure the adolescent apprentice's knowledge, perception and risk factors predisposing to hypertension to elicit responses from the respondents of the study using an interviewer administered questionnaire.

The questionnaire was organized into sections include the socio demographic section (Section A), Section B constituted information regarding the prevalence of hypertension with Section C eliciting information about knowledge of the respondents on hypertension and Sections D and E elicits information on perceptions and risk factors predisposing the respondents to hypertension respectively (see Appendix I).

3.13 Procedure for data collection

Data collection was carried out within a period of three weeks (between September 1st - 19th, 2014). Visits were made to the selected communities. Four research assistants were recruited and trained for the study. The training commenced with introduction of the trainer or the principal investigator, followed by the background of the study and objectives. The training focused on the objectives and importance of the study, the sampling processes, how to administer the study instruments, how to secure respondents' informed consent, general interviewing skills using Yoruba language and how to measure respondents' blood pressure, weight and height.

The researcher and the four trained research assistants took physical measurements which include the measurement of weight, height, and blood pressure among the respondents (272 males and 150 females) between 10am and 5pm daily. Weight was measured to the nearest 0.1 kg, using a bathroom weighing scale, while height was measured to the nearest 0.5 cm, using a meter rule. The body mass index (BMI) for each of the subjects was then calculated from weight (in kilogram), divided by a square of the height (in meter); and classified as obese when the BMI was greater or equal to 30, overweight when the BMI was between 25.0 and 29.9, normal weight when the BMI was between 18.5 and 24.9, and underweight when the BMI was less than 18.5.

The blood pressure was measured in the sitting position by trained and qualified nurses, using a mercury sphygmomanometer with the appropriate size of cuff; and standard measures were taken to ensure accuracy. Two consecutive measurements were taken at an interval of at least ten minutes, but only the second measurement was used in calculating the mean systolic and diastolic blood pressures that serve as the blood pressure of the respondents.

3.14 Data Management

The researcher checked all the administered questionnaires one by one and edit them for purpose of completeness and accuracy. The questionnaires were coded for easy identification and recall of any instrument with problem which aided correct data entry and analysis. The data was manually coded and entered into the computer for analysis.

3.15. Data Analysis

Data were entered and analyzed by a statistician using the SPSS version 20.0 windows. The data entered into the computer was subjected to Descriptive (mean, median, mode), and Inferential (Chi-Square) statistical analyses. Knowledge scores 0-11, 12-22 and >23 were classified as poor, fair, and good respectively. The perception scores were categorized as 0-5 and >5 as negative and positive perception respectively. In conclusion, findings was summarized and presented in tables and charts.

3.16. Ethical Considerations

The ethical principles guiding the use of human participants in research was taken into consideration in the design and conduct of this study. Due considerations was given to research ethics as applied to human participants (Ringhenim 1992, Osuntokun 1992, World Medical Assembly 2000, Obono et al., 2006). Permission to participate in the study was obtained from all participating adolescent apprentice by informed consent and voluntary participation. Each participating respondent were provided with information about the focus of the study, study objectives and methodology.

In addition, the respondents were assured of the utmost respect for confidentiality, inconveniences and potential benefits of the research. There were no identifiers such as name of the respondents on the questionnaires, only serial numbers were used on the

questionnaires as a means of identification. All information that were provided by the respondents were kept confidential.

CHAPTER FOUR

RESULTS

4.1 Respondents' Socio-demographic characteristics

A total of 422 adolescent apprentice in Ibadan North East Local Government Area were interviewed and the socio-demographic profile of the respondents is presented in Table 4.1.

Most (49.2%) were part time apprentice and large percent (42.4%) of the respondent had junior secondary school as their highest level of education while very few (3.8%) had no formal education. Most (51.7%) were Christians and they were from Yoruba ethnic group (86.5%). The ages of the respondents ranged from 10 to19 years with a mean age of 15.4 ±2.7 years. 34.1 per cent of the respondents were between the ages of 10 to 14 years while 65.9 percent were between the ages of 15 to 19 years. The ratio of male respondents to female respondents was two to one, with the proportion of male being 64.5 per cent compared to that of female (35.5%). Majority (82.5%) had never married and large percent (53.3%) of the respondents had spent 1 to 2 years in their apprentiship work with a mean of 1.57±1.2 years. For money earned in a week as a gift or any other source by the respondents, 61.3% of them had earned less than ₦1000 in a week, followed by 24.9% who claimed that they had earned between ₦1000 and ₦1900 in a week.

Table 4.1: Respondent's socio-demographic information (N=422)

Variables		Frequency	Percentage
Type of apprentiship	Tailoring	115	27.3
	Hairdressing/Barbing	91	21.6
	Carpentry	26	6.2
	Patient Medicine vendor	29	6.9
	Electronic works	24	5.7
	Automobile repairer	48	11.4
	Spare part sellers	52	12.3
	Shoe maker	11	2.6
	Aluminum framing	14	3.3
	Printing	6	1.4
	Photography	6	1.4
Mode of apprentiship	Full time	172	40.8
	Part time	250	59.2
Marital status	Never married	348	82.5
	Engaged/About to get married	51	12.1
	Currently married	23	5.5
Highest level of education	No formal education	16	3.8
	Primary	153	36.3
	Junior Secondary	179	42.4
	Senior Secondary	74	17.5
Age	10-14	144	34.1
	15-19	278	65.9
Sex	Male	272	64.5
	Female	150	35.5
Ethnicity	Yoruba	365	86.5
	Igbo	45	10.7
	Hausa	12	2.8
Religion	Christianity	218	51.7
	Islam	182	43.1
	Traditional	22	5.2
Years spent in apprentiship work Category	> 1	122	28.9
	1-2	225	53.3
	3-4	67	15.9
	5-6	5	1.2
	7-8	3	.7
Money earn in a week as a gift or any other Source	>#1000	284	67.3
	#1000-#1900	105	24.9
	#2000-#2900	24	5.7
	#3000-#3900	9	2.1

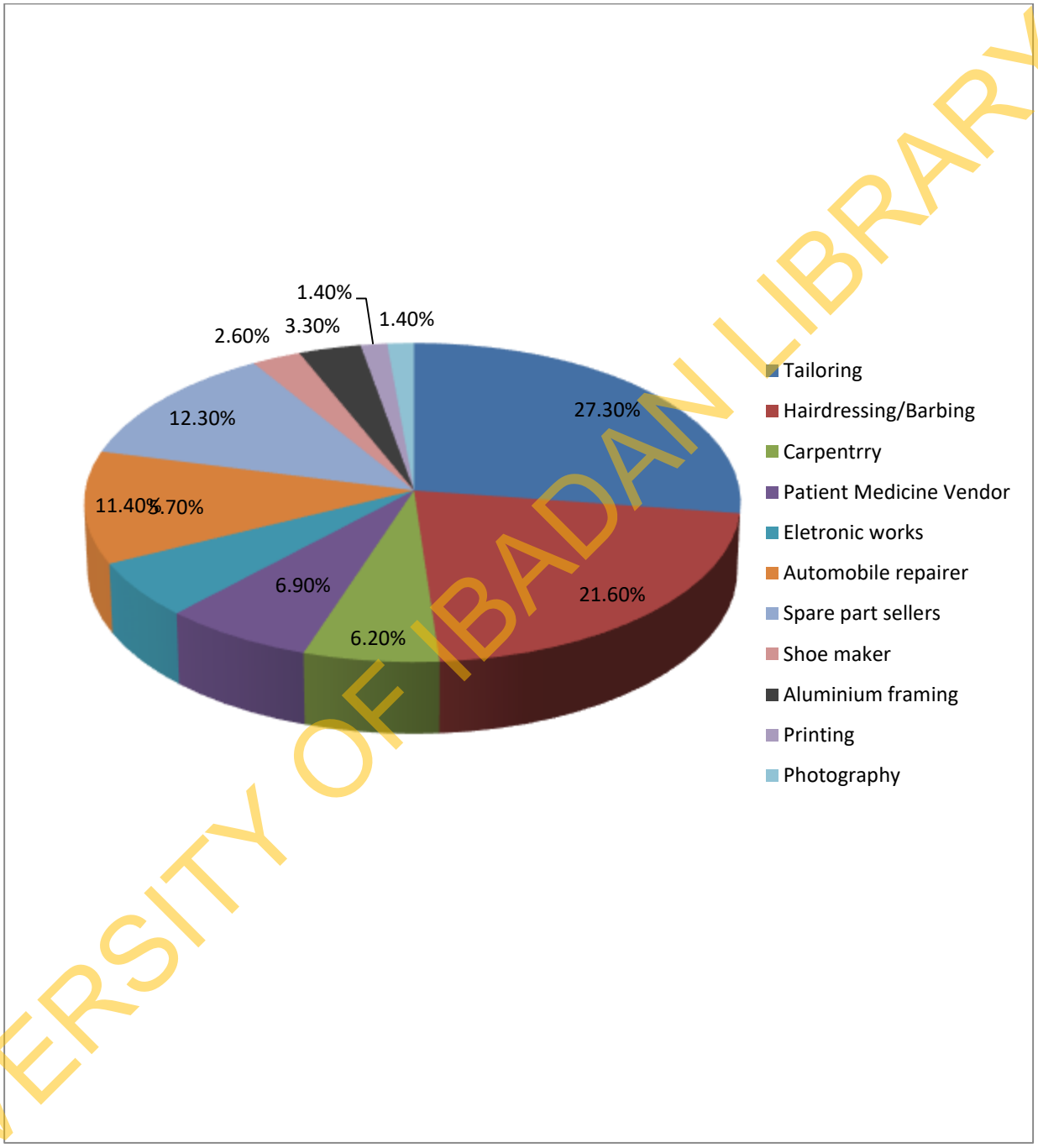

Fig 4.1. Type of apprentiship of the respondents.

4.2 Prevalence of Hypertension

Table 4.2.1 and 4.2.2 presents results relating to the prevalence of hypertension among the respondents. The mean height of males and female respondent's were1.63±0.10 meters and 1.62±0.08 meters. The mean weight for females was 46.87±10.34Kg and for males 47.23±11.08Kg. Both the weight and the height increased linearly with age of the subjects. The Body Mass Index of the respondents' was calculated. Majority (66.8%) of the subjects were underweight many (32.2%) were normal while few (0.9%) were overweight with mean 1.3±0.5kg/M^2. The anthropometric variables were found to increase with age increased linearly with age of the subjects (Table 4.2.1 and Figure 4.2.1).

The mean systolic (SBP) and diastolic (DBP) blood pressures of the population were 106.6±17.8 and 65.2±16.8mmHg respectively. The mean SBP and DBP for males were 107.2±17.4 mmHg and 65.1±17.1 respectively while the mean SBP and DBP for females were 105.6±18.5 mmHg and 65.4±15.9 mmHg respectively (Table 4.2.2.). In terms of adolescent age groups the mean SBP of males and females between 10-14 years are 98.7±15.5 and 93.6±18.9 respectively and 15-19 years are 111.9±16.6 and 111.1±15.6 respectively while the mean DBP of males and females between 10-14 years are 54.6±16.3 and 51.8±15.9 respectively while 15–19 years are 71.0±14.6 and 71.6±11.5 respectively. The Body Mass Index (BMI) of the respondents' was calculated. Majority (66.8%) of the subjects were underweight many (32.2%) were normal while few (0.9%) were overweight with mean 1.3±0.5kg/M^2 (Table 4.2.2).

The prevalence of hypertension in the study population of 422 adolescents was 14.9%. Among these 272 (64.5%) were males and 150 (35.5%) were females. Among the hypertensive adolescents, 52 subjects (12.3%) had pre-hypertension, 10 subjects (2.4%) were classified as stage I while 1 subject (0.2%) had stage II hypertension. About 359 subjects (85.1%) had normal blood pressure. Prevalence rate of hypertension among male and female is 14.7% and 15.3% respectively $p>0.05$ (table 4.2.1 and fig. 4.2.2).

Table 4.2.1 Prevalence of Hypertension

Distribution of Body Mass Index of the respondents according to sex N=422

Body Mass Index	Male n=272		Female n=150	
	Frequency	Percentage	Frequency	Percentage
>18.5------Underweight	180	66.2	102	68.4
18.5-24.9-----Normal	88	32.4	48	32.0
25.0-29.9------Overweight	4	1.5	0	0

Table 4.2.1

Distribution of mean blood pressure category of the respondents' according to sex and age group

	SBP mmHg		DBP mmHg	
Age group (Years)	Male	Female	Male	Female
10-14	98.7±15.5	93.6±18.9	54.6±16.3	51.8±15.9
15-19	111.9±16.6	111.1±15.6	71.0±14.6	71.6±11.5

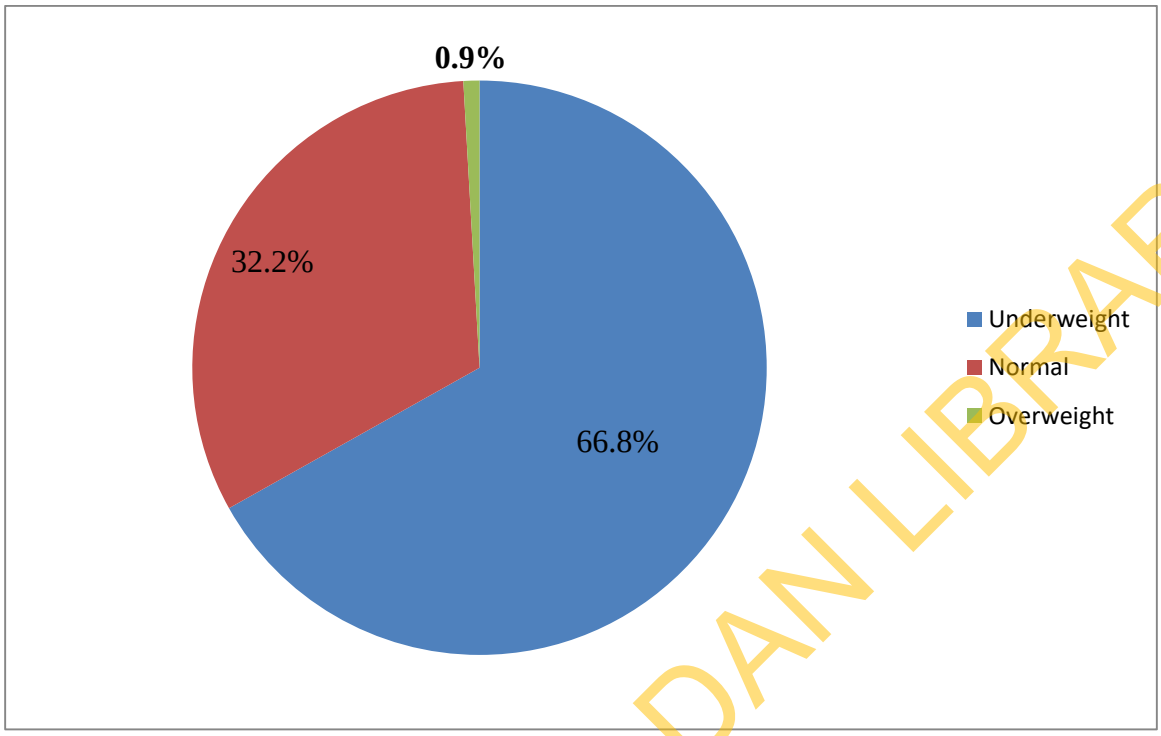

Fig 4.2.1 Distribution of BMI among the respondents.

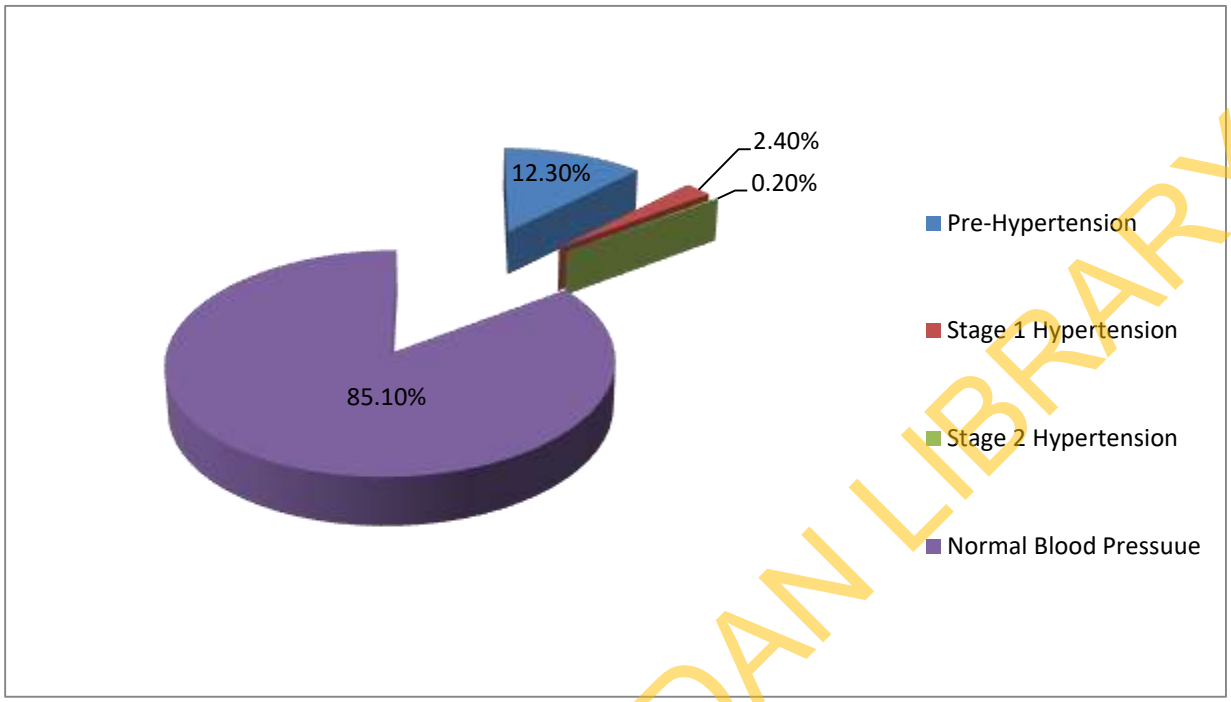

Fig. 4.2.2 Prevalence of hypertension among respondents.

4.3. Knowledge of Hypertension

This section provides results on questions relating to knowledge of respondents to hypertension. Slightly above half (55.7%) of the respondents do not believe that hypertension begins with little or no symptoms. 62.6 per cent believed that hypertension can be cured. 64.9 per cent believed that hypertension can be cured. 64.9 per cent believed that hypertension is cured when there are no symptoms while on medication. Majority (78.9%) of the respondents were of view that hypertension is associated with raised blood pressure. Large percentage of the respondents (19.2%) were of view that hypertension can be caused by anxiety. About 19.1 per cent of the respondents believed that severe headache is a sign and symptoms of hypertension. 16.8 per cent of the respondents were of view that hypertension can be prevented by checking blood pressure regularly (see table 4.3.1).

About 31.8 per cent of the respondents were of view that tobacco consumption can predispose adolescents to hypertension. About a third (32.9%) of the respondents were of view that excessive salt intake can predispose adolescents to hypertension. 33.6 per cent of the respondents were of view that alcohol consumption can predispose adolescents to hypertension. About a third (31.5%) of the respondents were of view that obesity can predispose adolescents to hypertension. 63.7 per cent of the respondents were of view that stress can predispose adolescents to hypertension. 37.2 per cent of the respondents were of view that physical inactivity can predispose adolescents to hypertension. 15.9 per cent of the respondents were of view that inadequate consumption of fruits and vegetables can predispose adolescents to hypertension (see table 4.3.2).

About 160 (28.2%) respondents were in view that hypertension has no known cause. 104 (18.3%) respondents were in view that what a person eat could be a factor that may contribute in establishing hypertension. One hundred and seventy one (30.1%) respondents were in view that sustained stress may be involved in establishing hypertension. One hundred and thirty three (36.9%) respondents were in view that poor medication taking may result in poor control of blood pressure (see table 4.3.3).

The overall mean knowledge score of the respondents is 14.0±4.5.Respondents' overall knowledge of hypertension can be rated as fair; majority (63.5%) of the respondents had fair knowledge while 32% and 4.5% had poor and good knowledge respectively (see details in Figure 4.3).

Table 4.3.1 Respondents' Level of Knowledge on Hypertension

Variable		Frequency	Percentage (%)
*Hypertension begins with little or no symptoms	Yes	187	44.3
	No	235	55.7
**Hypertension can be cured	Yes	264	62.6
	No	158	37.4
**Hypertension is cured when there are no symptoms while on medication	Yes	274	64.9
	No	148	35.1
Association with Hypertension	**Low blood pressure	47	11.1
	*Raised blood pressure	333	78.9
	**Normal blood pressure	42	10.0
Causes of Hypertension	**Not having money	136	11.8
	*Smoking	98	8.5
	**Anxiety	221	19.2
	*Inadequate consumption of fruits and vegetables	60	5.2
	*Lack of physical activities	90	7.8
	**Malaria	78	6.8
	*Alcohol consumption	114	9.9
	*Stress	220	19.1
	*Eating high fat diet	68	5.9
	*Excessive taking of salty foods	69	6.0
Signs and Symptoms of Hypertension	*Severe Headache	188	19.1
	**Imbalance	112	11.4
	*Nose bleeding	50	5.1
	*Vomiting	49	5.0
	**Body pain	104	10.6
	**Sleeplessness	155	15.7
	**Weight loss	116	11.8
	**Skipping of voice	110	11.2
	*Confusion	39	4.0
	*Changes in vision	62	6.3
Ways in which can be prevented	*Reduce salt intake	97	9.3
	**Avoid shouting	116	11.1
	**Praying	114	10.9
	*Checking blood pressure regularly	176	16.8
	**Taking Hypertension medicines	99	9.4
	** Avoid fighting	67	6.4
	*Avoid smoking	110	10.5
	*Avoid taking alcohol	92	8.8
	**Drinking too much water	36	3.4
	*Engaging in regular exercise	141	13.5

* Correct
** Incorrect

Table 4.3.2: Respondents knowledge on risk factors predisposing to Hypertension

Variable	Yes (%)	No (%)	Don't know (%)
Tobacco consumption	134 (31.8)	180 (42.7)	108 (25.6)
Excessive salt intake	139 (32.9)	167 (39.6)	116 (27.5)
Alcohol consumption	142 (33.6)	170 (40.3)	110 (26.1)
Obesity	133 (31.5)	167 (39.6)	122 (28.9)
Stress	269 (63.7)	72 (17.1)	81 (19.2)
Physical inactivity	157 (37.2)	139 (32.9)	126 (29.9)
Inadequate consumption of fruits and vegetables	67 (15.9)	177 (41.9)	178 (42.2)

Table 4.3.3: Respondents' knowledge on statements applied to hypertension

Statement	Number	Percentage (%)
Hypertension has no known cause	160	28.2
What a person eats could be a factor that may contribute in establishing hypertension	104	18.3
Sustained stress may be involved in establishing hypertension	171	30.1
Poor medication taken may result in poor control of blood pressure	133	23.4

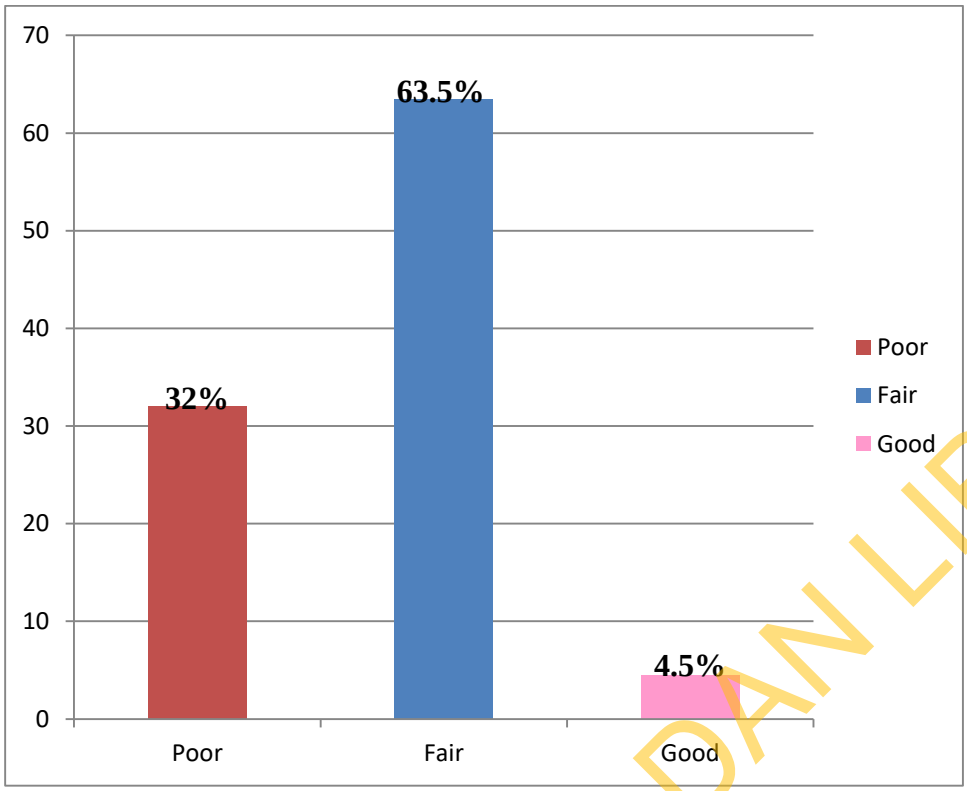

Fig 4.3 Respondents level of knowledge on hypertension.

4.4. Perception of respondents

This section provides results on questions relating to perceptions of respondents to hypertension. About 26.1% of the respondents were in response to the statement "Hypertension is not common to adolescents". More than a quarter (37.9%) of the respondents reported that hypertension is detectable among adolescents. 30.8 per cent of the respondents were in response to the statement "I am inclined to believe that there is no serious risk of a hypertensive event if I miss my medication". More than a quarter (34.8%) of the respondents reported that they had not thought of hypertension as a serious health condition requiring serious medical attention. Few (25.6%) of the respondents were in response to the statement "Adolescents cannot have hypertension because they are young". Some (45.5%) of the respondents were in response to the statement "Every person can experience the complications of hypertension as a result of not taking appropriate medications". About quarter (31.3%) of the respondents reported that emotional stress cannot lead to hypertension. Many (54.7%) of the respondents were in response to the statement "I have confidence that the medications taking can control blood pressure" Majority (65.4%) of the respondents reported that routine blood pressure is necessary for adolescents to know if they have high blood pressure. 36.7 per cent of the respondents were in response to the statement "Adolescents should not be bothered about hypertension because it will go away with time". Some (45.0%) of the respondents were in response to the statement "Use of herbs is better to treat hypertension than western medicines".

Perception score on hypertension was calculated for each respondent using a 11-point perception scale. Each correct answer had a point score of 1 and wrong answers had a point score of 0. The scores were summed up to give the actual point score for each respondent. The respondents has mean perception score of 4.4$\pm$3.0 Category code were allotted to each respondent to in order to know if they have negative (0-5) and positive (>5) perception. Majority (61.1%) of the respondents has negative perception and few (38.9%) have positive perception (see figure 4.4).

Table 4.4: Perception of respondents on Hypertension

Statement N=422 Responses N	Yes (%)	No (%)	Don't know (%)
Hypertension is not common among adolescents	110 (26.1)	143 (33.9)	169 (40.0)
Hypertension is detectable among adolescents	152 (36.0)	110 (26.1)	160 (37.9)
I am inclined to believe that there is no serious risk of hypertension if I miss my medication	130 (30.8)	129 (30.6)	163 (38.6)
I have not thought of hypertension as a serious medical condition requiring serious medical attention	147 (34.8)	132 (31.3)	143 (33.9)
Adolescents cannot have hypertension because they are young	108 (25.6)	165 (39.1)	149 (35.3)
Every person can experience the complication of hypertension as a result of not taking appropriate medication	192 (45.5)	90 (21.3)	140 (31.3)
Emotional stress cannot lead one to hypertension	132 (31.3)	162 (38.4)	128 (30.3)
I have confidence that medication taking can control hypertension	231 (54.7)	61 (14.5)	130 (30.8)
Routine blood pressure is necessary for adolescents to know if they have high blood pressure	276 (65.4)	41 (9.7)	105 (24.9)
Adolescents should not be really bothered about hypertension because it will go away with time	155 (36.7)	109 (25.8)	158 (37.4)
Traditional herbs is better to treat hypertension than western medicine	190 (45.0)	106 (25.1)	126 (29.9)

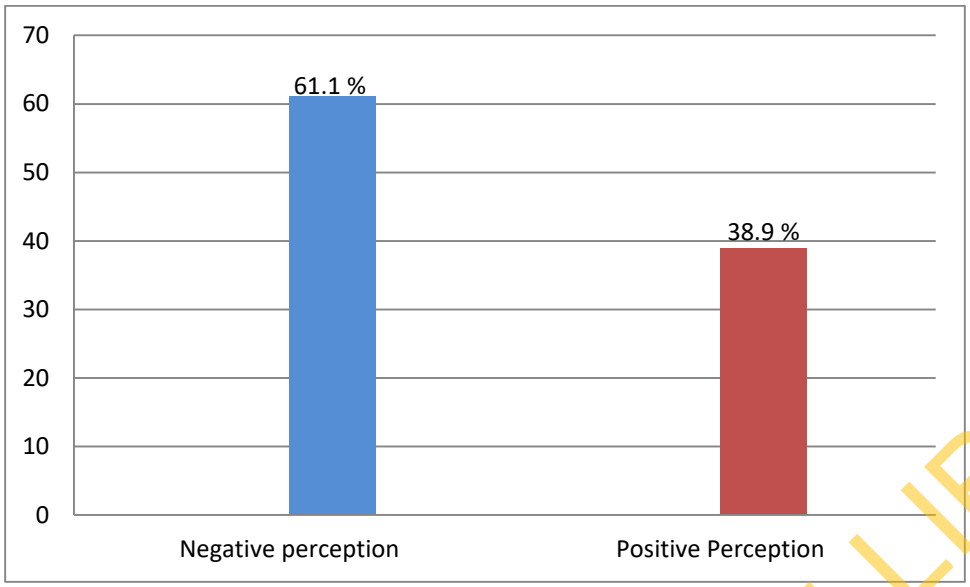

Fig. 4.4. Perception of adolescents on hypertension

4.5. Determination of risk factors to hypertension

4.5.1. Tobacco consumption

Determination of tobacco consumption as a risk factor predisposing to hypertension is shown in table 4.5.1 below. Large proportion (96.2%) of the respondents do not currently smoke cigarette while 3.1 per cent are currently smoking. The mean age of smokers is 13.1±2.8years. The prevalence of smokers increases with respondent's age group. For instance, the proportion of respondents in age group (10-14) and (15-19) were 0.7% and 3.1% respectively (see fig.4.5.1). Only 2.1 per cent of the respondents said cigarette smoking is harmful to their health. 28.1 per cent of the respondents (smokers) smoke Esse as brand of cigarette smoked. 0.9 per cent of the respondents had preference for the brand because they love it. 27.9 per cent of the respondents smoke in order to derive pleasure. 2.8 per cent of the respondents smokes 1-3 sticks of cigarette and 0.5 per cent smokes 4-6 and 7-9 sticks of cigarette in 24 hours respectively. 1.4 per cent of the respondents smokes 1-6 and 7-12 sticks of cigarette respectively, 0.7 per cent smokes 19-25 sticks of cigarette while 0.2 per cent smokes 13-18 sticks of cigarette in 7 days.

1.7 per cent of the respondents had been suggested smoking to by their co-apprentice/friends in the time past. 2.4 per cent of the respondents smoked no other substance apart from cigarette, 0.9 per cent smoked Indian hemp **"Jedi"** while 0.5 per cent smoked Indian hemp **"Igbo"** as other substances along side with cigarette.

35.3 per cent of the respondents experienced coughing as health problem they have experienced as a result of tobacco consumption. 32.9 per cent of the respondents' reason for not smoking is because they don't like it (see table 4.5.1).

Table 4.5.1 Tobacco consumption of the respondents

Variable	N=422	Number	Percentage(%)
Currently smoking cigarette	Yes	16	3.8
	No	406	96.2
Age Category of smokers	8-12	3	.7
	13-17	13	3.1
Cigarette Smoking harmful to health	Yes	9	2.1
	No	7	1.7
Brands of cigarette smoked	Rothmans	7	21.9
	Esse	9	28.1
	Brown London	6	18.8
	White London	5	15.6
	Benson and hedges	5	15.6
Preference for these brands	No reason	3	.7
	It is cheap	1	.2
	It makes me feel cool	3	.7
	It makes my heart beat	1	.2
	It is good	2	.5
	It is okay for me	1	.2
	I love it	4	.9
	It makes me work effectively	1	.2
What makes you to smoke	For satisfaction	11	25.6
	For pleasure	12	27.9
	To get rid of worries	8	18.6
	To get rid of anger	7	16.3
	To belong	2	4.7
	To defecate	3	7.0
People suggested Smoking to you in the time past	Brother/Sister	6	1.4
	Master	1	.2
	Co-apprentice/Friend	7	1.7
	Social network	1	.2
	None	1	.2
Substance smoked apart from cigarette	None	10	2.4
	Indian hemp (Jedi)	4	.9
	Indian hemp (Igbo)	2	.5
Health problem experienced as a result of tobacco consumption	Coughing	6	35.3
	Sneezing	4	23.5
	Headache	5	29.4
	Chest pain	2	11.8
Reasons for not smoking	My Parent/Master/Friends are against it	145	18.9
	I don't like it	252	32.9
	My religion is against it	148	19.3
	It is not good for my health	140	18.3
	I don't want to have high blood pressure	38	5.0
	No reason	44	5.7

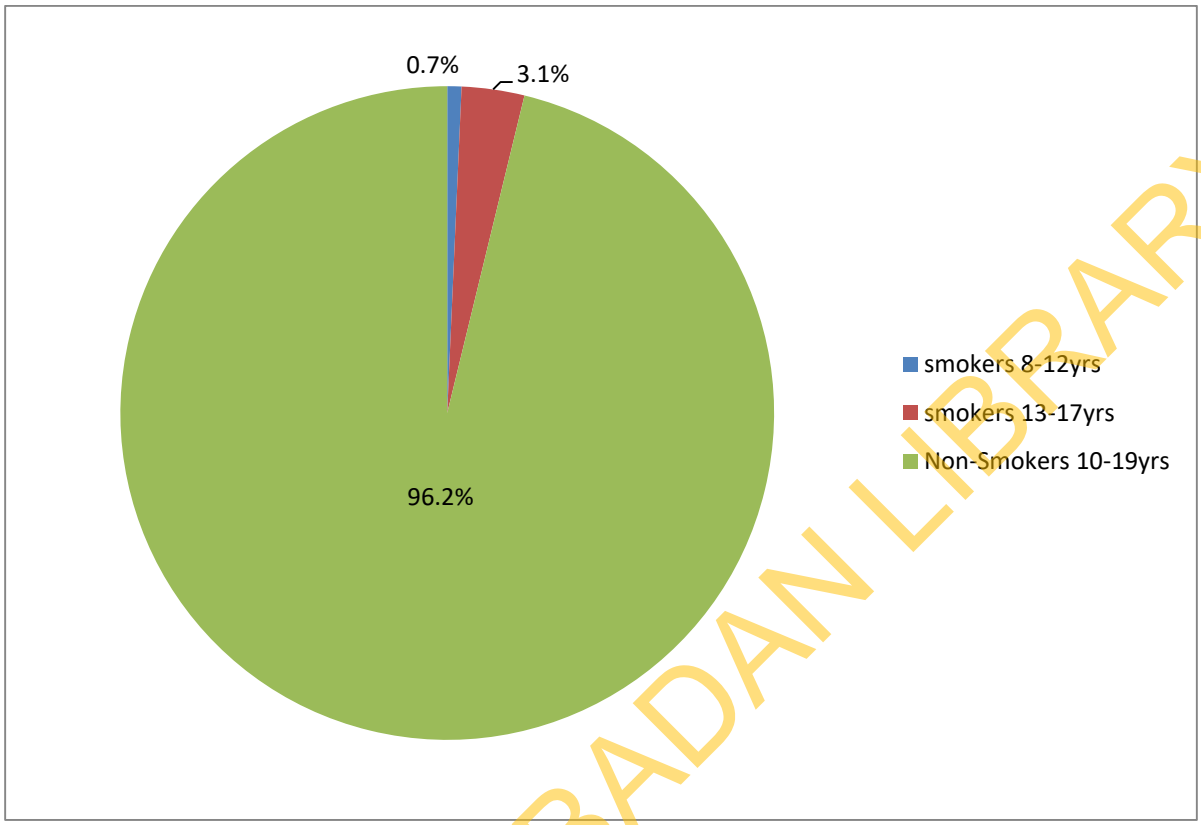

Fig. 4.5.1 Tobacco consumption of the respondents.

4.5.2. Alcohol consumption

Determination of alcohol consumption as a risk factor predisposing to hypertension is shown in tables 4.5.2a, 4.5.2b and 4.5.2c below.

Large proportion (77.5%) of the respondents had not ever taken alcohol while 22.5 had ever taken alcohol. The mean age of those that drinks alcohol is 10.9± 2.9 years. The prevalence of alcohol takers increases with respondents' age group. For instance, the proportion of respondents when they started taking alcohol in age group (6-11years) and (12-17 years) were 11.8% and 10.7% (see fig.4.5.2). 22.1per cent of the respondents have ever drunk an alcohol-containing beverages. 14.1 per cent of the respondents took star as the brand of alcohol they drank. 8.3 per cent of the respondents prefer the brands of alcohol for pleasure.

About 14.7% of the respondents drank alcohol-containing beverages between 1-20 days, 6.9 per cent drank alcohol-containing beverages between 21-40 days while 0.9 per cent drank alcohol-containing beverages between 41 days and above in the last 3 months. The mean of the respondents that drank alcohol in the last 3 months is 19.9 with 89 as the range. About 14.7 per cent of the respondents' had ever gotten drunk from alcohol-containing beverage. 8.1 per cent drank more than 7 bottles, 7.6 per cent drank 1-3 bottles while few 6.9 per cent drank 4-6 bottles of alcohol during the past 7 days. The mean of respondents that drank alcohol in the past 7 days is 5.8 with range as 19 (see table 4.5.2a).

About 12.1 per cent of the respondents were influenced by their co-apprentice/friends to take alcohol. 7.1 per cent of the respondents' most major influencer for taking alcohol were their co-apprentice/friend (see table 4.5.2b).

19.3 per cent of the respondents experienced vomiting as a health problem as a result of alcohol consumption. One of the reasons of the respondents not drinking is that 31.6 per cent don't like it (see table 4.5.2c).

Table 4.5.2a: Alcohol consumption of the respondents **N=422**

Variable n=95		Number	Percentage (%)
Have you ever taken alcohol	Yes	95	22.5
	No	327	77.5
Drunk an alcohol-containing beverage	Yes	85	20.1
	No	10	2.4
Alcohol takers age	6-11 years	50	11.8
	12-17 years	45	10.7
Preference for the brands of alcohol taken	No reason	23	5.5
	It makes me active	2	.5
	I want to become a star	5	1.2
	It gives me strength	7	1.7
	It is easy to come by	1	.2
	It is affordable	4	.9
	For pleasure	35	8.3
	It is a king to cure pile	1	.2
	Influence of significant orders	10	2.4
Days drank alcohol-containing beverages in the last three months	1-20	62	14.7
	21-40	29	6.9
	41- and above	4	.9
Ever gotten drunk from alcohol containing beverages	Yes	62	14.7
	No	33	7.8
Number of bottles of alcohol drunk during the Past 7 days	1-3	32	7.6
	4-6	29	6.9
	7 and above	34	8.1

Table4.5.2b: Influencers of respondents for taking alcohol **N=422**

Influencers n=95	Yes (%)	No (%)	Don't know (%)
Radio/Television	32 (7.6)	60 (14.2)	3 (.7)
Newspaper/poster/ Leaflet	3 (.7)	81 (19.2)	11 (2.6)
Social network	6 (1.4)	84 (19.9)	5 (1.2)
Parents/Brothers/Sisters/Relatives	39 (9.2)	51 (12.1)	5 (1.2)
Co-apprentice/Friends	51 (12.1)	41 (9.7)	3 (.7)
Religious Leaders	5 (1.2)	88 (20.9)	2 (.5)
Master	17 (4.0)	73 (17.3)	5 (1.2)
Health worker	1 (.2)	91 (21.6)	3 (.7)

Table 4.5.2c Respondents' most major influencer, health problem experienced and reasons for not smoking N=422

Variable		Number	Percentage (%)
Most major influencer	Radio/Television	24	5.7
	Social network	4	.9
	Parents/Brothers/Sisters/Relatives	21	5.0
	Co-apprentice/Friends	30	7.1
	Religious Leaders	3	.7
	Master	13	3.1
Health problem experienced as a result of alcohol consumption	Vomiting	33	19.3
	Blurred vision	27	15.8
	Headache	17	9.9
	Injury	30	17.5
	Dizziness	27	15.8
	Fever	11	6.4
	None	26	15.2
Reasons for not drinking alcohol	My Parents/Master/Friends like it	138	19.7
	I don't like it	222	31.6
	My religion is against it	145	20.7
	It is not good for my health	139	19.8
	I don't want to have high blood pressure	33	4.7
	No reason	25	3.6

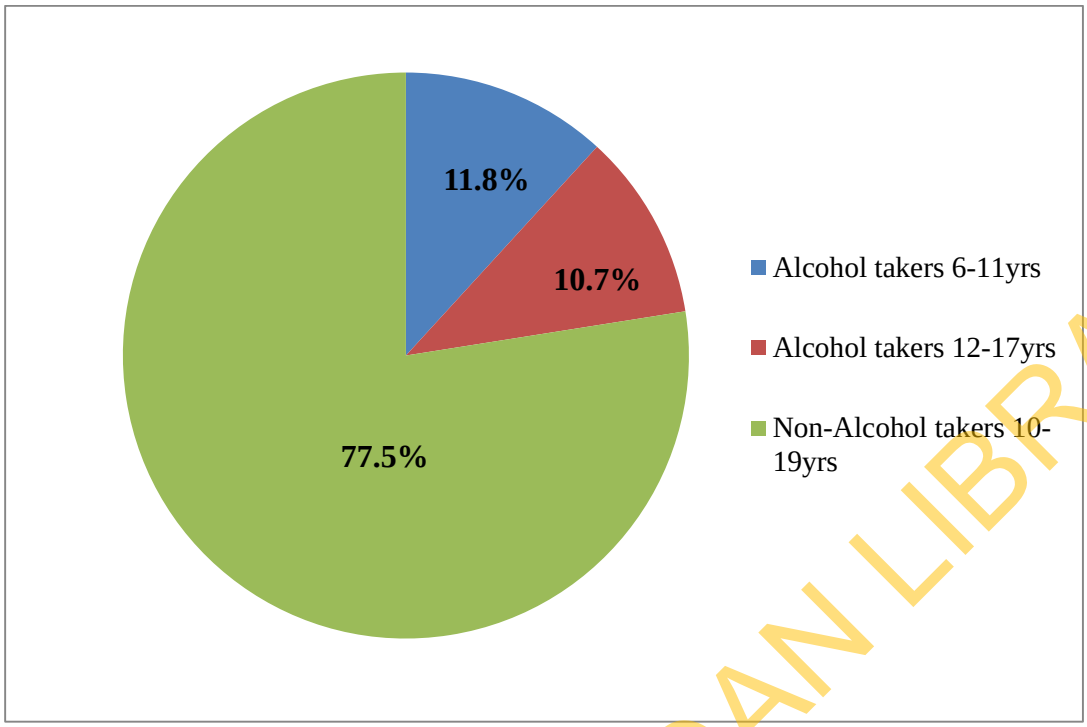

Fig. 4.5.2 Alcohol consumption of the respondents.

4.5.3. Dietary pattern of the respondents

Determination of diet as a risk factor predisposing to hypertension (Table 4.5.3)

This section provides results on questions relating to the diet of the respondents as a risk factor predisposing adolescents to hypertension. The respondents rated themselves regarding to their weight, majority (79.6%) of the respondents were normal. The respondents' frequencies of eating food daily, weekly and monthly were asked. Majority (83.2%) of the respondents eat starchy foods daily. Few (35.3%) eat foods containing fats and sugar weekly. 26.5 per cent of the respondents eat fruits and vegetables monthly. (see table 4.5.3 below)

The respondents rated their consumption of fatty foods and more than a quarter (37.2%) of them eat moderate fatty foods. Many (53.3%) of the respondents eat moderate salt in the food that they have been eating. 51.7 per cent of the respondents thought that the consumption of fat can lead to obesity.

Table 4.5.3 Dietary pattern of the respondents **N=422**

Variable		Number	Percentage (%)
Rate yourself as being	Underweight	70	16.6
	Normal	336	79.6
	Obese	14	3.3
	Over-weight	2	.5
Starchy foods	Daily	351	83.2
	Weekly	69	16.4
	Monthly	2	.5
Protein	Daily	306	72.5
	Weekly	114	27.0
	Monthly	2	.5
Foods containing fats and sugar	Daily	235	55.7
	Weekly	106	25.1
	Monthly	81	19.2
Dairy products	Daily	176	41.7
	Weekly	149	35.3
	Monthly	97	23.0
Fruits and vegetable	Daily	189	44.8
	Weekly	121	28.7
	Monthly	112	26.5
Rate your consumption of fatty foods	I eat a Lots of fatty foods	59	14.0
	I eat a Moderate fatty foods	157	37.2
	I eat a Little fatty foods	120	28.4
	I do not eat fatty foods at all	86	20.4
How much salt is in the food you have been eating	Lots of salt	55	13.0
	Moderate salt	225	53.3
	Little salt	141	33.4
	No salt	1	.2
Think consumption of fats can lead to obesity	Yes	218	51.7
	No	204	48.3

4.5.4. Stress conditions of the respondents

The respondents had experienced the following work related stressors in the last 7 days. Many (54.0%) of the respondents operated under pressure moderately at home. Some (48.1%) operated under pressure very much at work. 43.8 per cent tried to meet deadline moderately at work. Some (42.2%) of the respondents very much had inadequate funds to meet their personal needs. Some (47.9%) had no argument with their masters. 40.8 per cent of the respondents moderately had insufficient recreation. Some (45.0%) moderately had long working hours. 47.4 per cent of the respondents moderately had long sleeping hours. Many (57.8%) were able to obtain tools/equipment for working. More than half (52.4%) of the respondents had no anxiety about incidents that could cause injury at work (see table 4.5.4.).

About 23.0 per cent of the respondents had headache as a result of stress in the last one week (fig.4.5.4).

Table 4.5.4. Stress conditions of the respondents **N=422**

Statements	Responses		
	Very much (%)	Moderately (%)	Not at all (%)
Operate under pressure at home	96 (22.7)	228 (54.0)	98 (23.2)
Operate under pressure at work	203 (48.1)	167 (39.6)	52 (12.3)
Try to meet deadline at work	130 (30.8)	185 (43.8)	107 (25.4)
Inadequate funds to meet personal needs	178 (42.2)	105 (24.9)	139 (32.9)
Argument with masters	60 (14.2)	160 (37.9)	202 (47.9)
Insufficient recreation	86 (20.4)	172 (40.8)	164 (38.9)
Long working hours	129 (30.6)	190 (45.0)	103 (24.4)
Poor sleeping habits	67 (15.9)	200 (47.4)	155 (36.7)
Inability to obtain tools/ equipment for working	47(11.1)	131 (31.0)	244 (57.8)
Anxiety about incidents that could cause injury at work	71 (16.8)	130 (30.8)	221 (52.4)

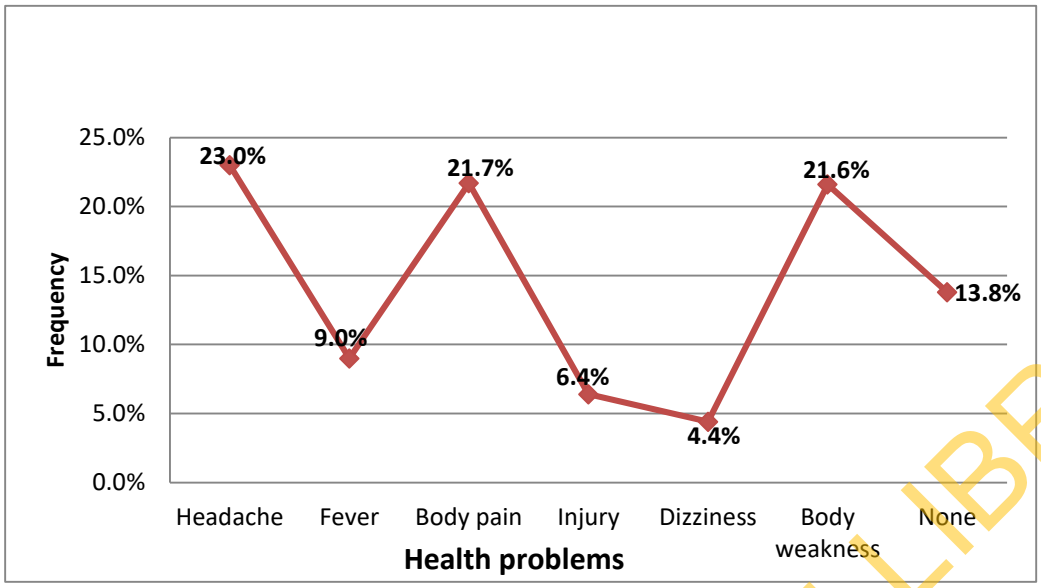

Fig. 4.5.4 Health problem experienced as a result of stress in the last 7 days

4.5.5. Level of physical inactivity of the respondents

Determination of physical inactivity as a risk factor predisposing to hypertension.

Many (54.0%) of the respondents were of view that obesity could be caused by lack of physical activities. All (100%) of the respondents had no physical exercise facilities in their workplace. Eventually, all (100%) of the respondents engaged in walking in the last 7 days. Few (31.8%) were engaged in football 12.6 per cent were engaged in tennis 7.1 per cent were engaged in snooker 15.6 per cent were engaged in cycling 12.1 per cent were engaged in skipping 12.8 per cent were engaged in jogging 16.4 per cent were engaged in running 10.7 per cent were engaged in swimming and 2.1 per cent of the respondents were engaged in volley ball in the last 7 days. (see table 4.5.5a and fig 4.5.5)

Many (50.0%) of the respondents' walked between1-2 hours in the last 7 days. 23.5 per cent played football between 1-2 hours. 9.0 per cent played tennis between 1-2 hours. 5.7 per cent played snooker between 1-2 hours. 8.5 per cent of the respondents' cycled between 1-2 hours. 7.3 per cent skipped between 1-2 hours. 7.3 per cent jogged for less than 1 hour. 6.6 per cent ran between 1-2 hours. 8.8 per cent swam between 1-2 hours and 1.4 per cent of the respondents played volley ball between1-2 hours in the last 7 days (see table 4.5.5b).

Table 4.5.5a Level of Physical inactivity of the respondents N=422

Variable		Number	Percentage (%)
Obesity can be caused by lack of physical activities	Yes	228	54.0
	No	194	46.0
Physical exercise facilities have	None	422	100.0
Walking	Yes	422	100.0
Football	Yes	134	31.8
	No	288	68.2
Tennis	Yes	53	12.6
	No	369	87.4
Snooker	Yes	30	7.1
	No	392	92.9
Cycling	Yes	66	15.6
	No	356	84.4
Skipping	Yes	51	12.1
	No	371	87.9
Jogging	Yes	54	12.8
	No	368	87.2
Running	Yes	69	16.4
	No	353	83.6
Swimming	Yes	45	10.7
	No	377	89.3
Volleyball	Yes	9	2.1
	No	413	97.9

Table 4.4.5b Hours per week spent on physical activities by the respondents N=422

Variable		Number (%)	Percentage (%)
Walking	>1hour	17	4.0
	1-2hours	211	50.0
	3-4 hours	134	31.8
	5-6 hours	42	10.0
	7-8 hours	18	4.3
Football	>1 hour	3	.7
	1-2 hours	99	23.5
	3-4 hours	28	6.6
Tennis	>1 hour	12	2.8
	1-2 hours	38	9.0
	3-4 hours	1	.2
	5-6 hours	1	.2
Snooker	>1 hour	6	1.4
	1-2 hours	24	5.7
Cycling	>1 hour	7	1.7
	1-2 hours	36	8.5
	3-4 hours	14	3.3
	5-6 hours	5	1.2
	7-8 hours	1	.2
Skipping	>1 hour	20	4.7
	1-2 hours	31	7.3
Jogging	>1 hour	31	7.3
	1-2 hours	22	5.2
Running	>1 hour	19	4.5
	1-2 hours	28	6.6
	3-4 hours	3	.7
Swimming	>1 hour	7	1.7
	1-2 hours	37	8.8
	3-4 hours	4	.9
Volleyball	>1 hour	1	.2
	1-2 hours	6	1.4

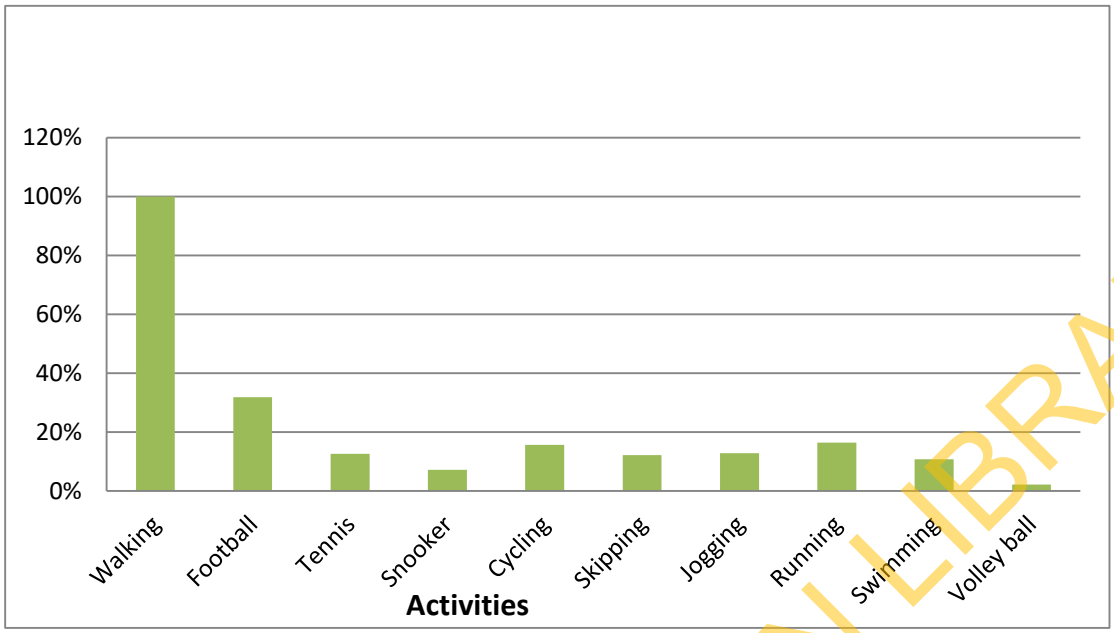

Fig 4.5.5 Physical activities engaged in the last 7 days.

4.6 TEST OF HYPOTHESES

The results of the hypothesis tested are shown below;

Hypothesis 1: There is no significant association between Age and knowledge of the respondents on hypertension. The result of the finding is shown in Table 4.6. Chi square was used to test if there is an association between age and knowledge of the respondent and it was found that there is no significant association statistically with P = 0.001. This means that the age of the respondents has no significant influence on their level of knowledge. Therefore, the null hypothesis was accepted.

Hypothesis 2: There is a significant association between sex and knowledge of the respondents. The result of the finding is shown in Table 4.6. The table shows that there is a statistical association between sex of the respondents on their knowledge with P = 0.18. This means that the sex of the respondents has a significant influence on their level of knowledge towards hypertension. Therefore, the null hypothesis was rejected

Hypothesis 3: There is no significant association between level of education and the knowledge of the respondents on hypertension. Table 4.6 shows the result of the finding. Chi square was used to test if there is an association between level of education and knowledge of the respondents and it was found that there is a significant association statistically with P = 0.00. This mean that the age of the respondents has a significant influence on their level of education towards hypertension. Therefore, the null hypothesis was thus rejected.

Table 4.6: Association between age, sex, level of education and knowledge of the respondents towards hypertension

Variable		Level of knowledge				
		Good	Fair	Poor	Total	P value
		n (%)	n (%)	n (%)	n (%)	
Age	10-14	3 (2.1)	79 (54.9)	62 (43.1)	144 (100.0)	0.001
	15-19	16 (5.8)	189 (68.0)	73 (26.3)	278 (100.0)	
Sex	Male	13 (4.8)	164 (60.3)	95 (34.9)	272 (100.0)	*0.18
	Female	6 (4.0)	104 (69.3)	40 (26.7)	150 (100.0)	
Level of education	No formal education	0 (0.0)	8 (50.0)	8 (50.0)	16 (100.0)	0.00
	Primary	3 (2.0)	82 (53.6)	68 (44.4)	153 (100.0)	
	Junior	11 (6.1)	120 (67.0)	48 (26.8)	179 (100.0)	
	Senior	5 (6.8)	58 (78.4)	11 (14.9)	74 (100.0)	

* Significant

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1. Socio-demographic characteristics and related information of respondents

This information is essential for interpretation of the findings presented later in this chapter and provides an indication of the representativeness of the study. The ages of respondents ranged from 10 – 19 years with a mean age of 15.4 years. This could be compared to a previous study conducted in Enugu among secondary school adolescents between the ages of 10 and 18 in 2013 revealed the age mean of 15.03 years (Ujunwa, Ikefuna, Nwokocha and Chinawa, 2013). The proportion of respondents who practiced Christianity is higher than those who are Muslim which are higher than those who practiced traditional religion.

5.2 Prevalence of Hypertension

The findings from this study revealed that about 0.9 per cent of the respondents were overweight. This is twelve times lesser than the findings of Ujunwa et al., 2013 in Enugu, among secondary school adolescents who were reported 10% overweight. The prevalence of hypertension in the study population was 14.9%. This is illustrated by the findings that the observed prevalence rates shows an increase in the prevalence rate of hypertension when compared to a rate of 5.4% and 3.3% obtained in Enugu (Ujunwa et al., 2013) and Southwest of Nigeria respectively. Though lower than values documented by Ejike et al., 2010 in Kogi as well as Mijinyawa in Kano. The difference in prevalence rates may be due to varying methodology, different criteria for diagnosis of hypertension and regional variations. Nevertheless the observed prevalence rate falls above the documented prevalence rate of adolescent hypertension of 1-13% in Nigeria adolescents. This is a challenge to be addressed by all individuals, significant orders and stakeholders including the health, education and other government sectors.

5.3. Knowledge of Hypertension

There is a significant relationship between level of education of the respondents' and knowledge on hypertension. Knowledge of hypertension increased significantly by respondent's age. This may probably due to their level of exposure in their environment to media, influence of significant orders and education. The increasing length of stay in the school and the exposure to various curricular and co-curricular learning opportunities

over the years may have accounted for this knowledge differential among respondents. A possible reason for this is that majority of the respondents are currently in school and probably just finished from their secondary schools.

5.4. Perception of Adolescents

In this study, less than a quarter (26.1%) of the respondents perceived that hypertension is not common among adolescents, and more than a quarter perceived that hypertension is detectable among adolescents (36.0%). 34.8 per cent had not thought of hypertension as a serious medical condition requiring serious medical attention. This may be due to the fact that many of the respondents still have the notion that hypertension is only seen in adult not among adolescents. Overall, more than half (65.4%) of the respondents' indicated that routine blood pressure is necessary for adolescent to know if they have high blood pressure. This may be due to the fact that the respondents are aware of their environment and may see their significant orders checking their blood pressure routinely in order to know the level of their blood pressure.

About 45.0 per cent perceived that traditional herbs is better to treat hypertension than western medicines. This may be due to the fact that many of the respondents still have the notion that traditional medicines is less expensive, available and likely to treat hypertension better than western medicines. Overall, this study also revealed that the proportion of respondents with negative perception about hypertension was 61.1%. This may be due to lack of adequate and appropriate knowledge or information about hypertension among adolescents. This may result in inaccurate and harmful behavior they are exposed to during this period of adolescence.

5.5. Risk factors predisposing to hypertension.

5.5.1. Tobacco Consumption.

The results of the present study indicated that 3.8% of the respondents currently smoke cigarette. This is higher that of the study conducted by Okafor (1992) who reported the prevalence of 2.1% among adolescents who currently smoke cigarette in Lagos.

2.1% indicated that cigarette smoking is harmful to their health. This may be due to the fact that many of the respondents still have the notion that smoking is accepted in the community and despite the effort of the government to barn smoking among adolescents and in the community at large some of the adolescents are still smoking it in enclosed areas such as parties, toilets, houses where the public cannot see them. This may be related to the reasons why they have preference for the brands of cigarette they smoked. They smoked because it is cheap (0.2 %), it makes them feel cool (0.7%), it makes their heart beat (0.2%), it is good (0.5%), it is okay (0.2%), they love it (0.9%) while 0.7% had no reason. The respondents indicated their reasons for not smoking. 18.9 per cent indicated that their parents/masters/friends are against it, don't like it (32.9%), their religion is against it (19.3%), it is not good for their health (18.3%), they don't want to have high blood pressure (5.0%) and 5.7 % had no reason. From these responses, it is observed that the respondents know healthful practices and they are not practicing it. This calls for continuous health education from their teachers, peers and stakeholders in their communities.

5.5.2. Alcohol Consumption

According to a study conducted in Enugu among secondary school adolescents by Ujunwa et al., 2013, Alcohol consumption was noted among 38.4%. Significant daily intake of alcohol was noted among 2.2% of those that consumed alcohol while 92.3% had no significant intake.

The results of the present study indicated that 22.7% of the respondents have ever taken alcohol which is lesser than that of the prevalence of 38.4% in the study of Ujunwa et al., 2013. The respondents indicated their reasons for taking alcohol. About 5.5 per cent had no reason, it makes them active (0.5%), want to become a star (1.2%), it gives them strength (1.5%), it is easy to come by (0.2%), it is affordable (0.9%), for pleasure (8.3%), it is a king to cure pile (0.2%) and influence of significant orders (2.4%). This calls for health education and promotion interventions from individuals, stakeholders,

governmental and non governmental agencies to institute youth friendly centers and equip all the libraries and ICT centers in the school and communities at large which could serve as relaxation center and learning institution respectively where adolescents could adopt healthy behavioral practices that will influence positive lifestyles among them.

5.5.3. Diet

In this study, about 16.6 per cent of the respondents rated their Body Mass Index (BMI) as being underweight, 79.8% normal, 3.3% obese and 0.5% overweight. When the BMI was conducted by qualified medical personnel, it was observed that 66.8% were underweight, 32.2% were normal and 0.9% were overweight. This implies that despite the respondents' knowledge on their BMI, routine check is needed in order to increase, reduce or maintain their BMI. According to the study conducted by Oduwole et al., 2012, the prevalence rate of respondents that were obese and overweight are 13.8% and 9.4% respectively. Also the prevalence rate of obesity in this study is 3.8% which is quiet more than that of the study conducted by Ujunwa et al., 2013 (1.9%). This could be related to high increase of carbohydrate consumption (83.2%), foods containing fats and sugar (55.7%) and dairy products (41.7%) on daily basis. This is supported by the statement that physical inactivity and sedentary lifestyles contribute to obesity and may be fundamental sources of energy imbalance (Goran et al., 1999).

5.5.4. Stress

The findings from this study revealed generally, the opinions of respondents to their work related stressors in the last 7 days. 48.1 per cent very much operated under pressure at work, 42.2% very much had inadequate funds to meet their personal needs, 45.0% moderately had long working hours and 36.7% do not have poor sleeping habit at all. This account to the fact that every individual undergo stress no matter its length because every individual hassle in one way or the other especially due to the socio economic rate of this country. The respondents indicated the health problem they have experienced in the last 7 days and 23.0% had headache, 9.0% had fever, 21.7% had body pain, 6.4% had injury, 4.4% felt dizzy, 21.6% had body weakness while 13.8 % had no health problem. This is supported by the notion that daily hassles which are stressors experienced in everyday life, have been found to be a better measure of the stress experienced by adults

and it also account for a greater percentage of the variance in overall health status (DeLongis et al., 1982).

5.5.5. Physical Inactivities

More than half (54.0%) of the respondents' were of the notion that obesity could be caused by lack of physical activities. Jago et al, 2006 documented that it is unclear if increased physical activity can protect overweight youth from progressing to high blood pressure, the most prevalent chronic illness associated with childhood obesity. All (100%) the respondents have no physical activities facilities in their workplace and engaged in walking in the last 7 days respectively. Although, the overall participation of the physical activities is very low this could be caused by lack of physical exercise facilities in their workplace. Boys are seen to engage in physical activities in the last 7 days than girls.

This could be supported by the result of the study conducted by Mane et al. 2012 among adolescents in western India that boys were seen to be more physically active and doing heavy exercise than girls. Likewise their overall level of participation in physical activity is low which could be explained on the basis that teenagers were spending more time in front of television; computer and video games and that there is unavailability of playgrounds in the nearest vicinity.

5.6. Implication for health education

The findings from this study have health promotion and education implications and suggest the need for multiple interventions directed at tackling this phenomenon. The fair knowledge that the population had might have resulted from the information gotten from their communities and workplaces this indicate that there is need to develop more specific health education programs. This information is helpful in identifying existing gaps in knowledge and perception and thereby useful in designing health promotional activities relevant to the communities, specifically to the adolescent apprentice workplaces. The inadequate knowledge on causation, prevention and unhealthy life-style changes should be addressed during these activities.

Public enlightenment programmes including awareness campaigns have the potential for reaching large numbers of people. While public enlightenment campaign can create awareness and influence knowledge, perception and attitudes and foster political will for

action, evidence of their effectiveness in changing behavior remains insufficient (Whitaker, Baker and Arias, 2007). However, efforts must be made to combine it with other strategies such as peer education to effectively address hypertension and risk factors among adolescent apprentice. Public enlightenment techniques could involve the use of leaflets, documentaries, jingles and bill boards (Whitaker, Baker and Arias, 2007). Use of one or more of these information media could be very helpful as the weaknesses of one could be counter-balanced by the strengths of others. Furthermore, screening and counseling should be made accessible for communities with an endeavor to foster positive beliefs and self-reliance regarding life-style changes. Masters should serve as role models to their apprentice so as to adopt positive lifestyle.

Partnership with relevant sectors, agencies and non-governmental associations can be used to address hypertension and risk factors among adolescent apprentice. Effective prevention will require the planning of actions together, and the sharing of funding or other resources with other relevant organization or institutions. Partnership involves pooling of resources from different parties together to address common concerns. The artisans' association could collaborate with relevant governmental organizations such as Ministries of Health, Education, Local government and non-organizational organizations to organize behavioral change interventions that can sensitize and educate apprentice, masters and parents on hypertension and risk factors.

In addition, limited motivation to adopt healthy lifestyles stresses the need to further develop an environment conducive to such healthy lifestyles. Importantly, adoption of healthy lifestyles by larger segments of the population is likely to depend on further development of relevant public policies, including development of more facilities and opportunities for the public to engage in leisure physical exercise and improved food labeling in order to promote a healthy diet and foster regulatory measures to promote a smoke-free society (Bovet et al., 1991)

Combined use of two or more of the afore-mentioned health promotion and education strategies is prefered for preventing and controlling hypertension and risk factors among adolescents. The combination of strategies ensures that weaknesses of one are counter-balanced by the strengths of the others.

5.7. Conclusion

In conclusion, this study reveals that Hypertension is prevalent among adolescent apprentice. There is a need for further investigations on prevalence, knowledge, perception and risk factors predisposing adolescents apprentice in Ibadan North East Local Government Area to hypertension.

The adolescents had negative perception towards hypertension, therefore Health education programs including routine standardized blood pressure assessments should be conducted among the adolescents.

5.8. Recommendations

Based on the findings from this study, the following recommendations are presented:

1. Periodic screening and monitoring of blood pressure of adolescents should be incorporated into the school health and artisans programs respectively.
2. Policies that will completely ban smoking and alcohol consumption among adolescents should be supported and other kinds of policies that will contribute to their wellbeing and lifestyles should be introduced to their associations.
3. Parents, relatives, masters and peers should serve as role models and positively influence the behavior of their children, apprentice and friends respectively in order to adopt healthy lifestyles and behaviors.
4. From the study, it was observed that none of the apprentice had no physical exercise facility in their work place, therefore, health education and promotion interventions from individuals, stakeholders, governmental and non governmental agencies should be encouraged in order to institute functioning youth friendly centers and equip all the libraries and ICT centers in the school and communities at large which could serve as relaxation center and learning institution respectively where adolescents could adopt healthy behavioral practices that will influence positive lifestyles among them.
5. Healthy dietary practices, healthy physical activities and stress reduction activities should be encouraged among the adolescents so as to adopt a healthy lifestyle.
6. The local government should ensure that the apprentice in all artisan association should be registered so that when individuals and partners need their data they will know the appropriate channel to follow.

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APPENDIX

QUESTIONNAIRE

PREVALENCE OF HYPERTENSION AND RISK FACTORS AMONG ADOLESCENT APPRENTICE IN IBADAN NORTH EAST LOCAL GOVERNMENT AREA IBADAN, OYO STATE

Dear Respondents,

My name is Akanbi Funmilola Adebunmi, a Post Graduate student of the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan. The purpose of this study is to determine the **prevalence of hypertension and risk factors among adolescent apprentice in Ibadan North East Local Government Area Ibadan, Oyo State.** Information gotten from this study will help in the design of programs aimed at reducing the prevalence of hypertension and risk factors among adolescents.

You are therefore invited to participate in this research and your identity, responses along side with your opinion will be strictly kept confidential and safeguarded for the purpose of this research only. In conclusion, note that you do not have to write your name on this questionnaire, please kindly give honest answers to the questions asked as much as your maximum cooperation will assist in making this research a success.

Kindly indicate your willingness to participate or otherwise by ticking (√) the appropriate box below

1. Yes ☐ 2. No ☐

Instruction: Please respond to the following questions.

SECTION A: SOCIO DEMOGRAPHIC CHARACTERISTICS

1. What type of Apprenticeship do you do? 1. Tailoring [ ] 2. Hairdressing/Barbing [ ] 3. Carpentry [ ] 4. Bricklaying [ ] 5. Patient Medicine Vendor [ ] 6. Electronic works [ ] 7. Automobile repairer [ ] 8. Others {please specify} _____
2. What is your mode of apprenticeship? 1. Full time [ ] 2. Part time [ ]
3. What is your marital status? 1. Never married [ ] 2. Engaged/About to get married [ ] 3. Currently married [ ] 4. Widowed [ ] 5. Separated [ ] 6. Divorced [ ] 7. Co-habiting [ ]
4. What is your highest level of education? 1. No formal education [ ] 2. Primary [ ] 3. Junior Secondary [ ] 4. Senior Secondary [ ] 5. Others (please specify) _____
5. Age as at last birthday_____ (in years)
6. Sex 1. Male [ ] 2. Female [ ]
7. Ethnicity 1. Yoruba [ ] 2. Igbo [ ] 3. Hausa [ ] 4. Others (please specify) _____
8. Religion 1. Christianity [ ] 2. Islam [ ] 3. Traditional [ ] 4. Others (please specify)_____
9. What is the numbers of years already spent in apprenticeship work? _____year(s)
10. How much do you earn in a week either from gift or any other source? #_____

SECTION B: PREVALENCE OF HYPERTENSION

11. Height _____m.
12. Weight _____kg.
13. BMI _____kg/m^2 (Body Mass Index)
14. BP _____mmHg (Blood Pressure) 1st reading BP_____mmHg (Blood Pressure) 2nd reading

SECTION C: KNOWLEDGE OF HYPERTENSION

Instruction: Please indicate your responses from the statements below.

15. Hypertension begins with little or no symptoms. 1. Yes [ ] 2. No [ ].

16. Hypertension can be cured. 1. Yes [ ] 2. No [ ].

17. Hypertension is cured when there are no symptoms while on medication. 1. Yes [ ] 2. No [ ].

18. Which of the following is associated with Hypertension? 1. Low Blood Pressure [ ] 2. Raised Blood Pressure [ ] 3. Normal Blood Pressure [ ].

19. The causes of hypertension are (***You may choose more than ONE answer)*** 1. Not having money [ ] 2. Smoking [ ] 3. Anxiety [ ] 4. Inadequate consumption of fruits and vegetables [ ] 5. Lack of physical activity [ ] 6. Malaria [ ] 7. Alcohol consumption [ ] 8. Stress [ ] 9. Eating high fat diet [ ] 10. Excessive taking of salty foods [ ]

20. Signs and symptoms of hypertension are 1. Severe headache [ ] 2. Imbalance [ ] 3. Nose bleeding [ ] 4. Vomiting [ ] 5. Body pain [ ] 6. Sleeplessness [ ] 7. Weight loss [ ] 8. Skipping of voice [ ] 9. Confusion [ ] 10. Changes in vision [ ]

21. Ways in which Hypertension can be prevented are (***You may choose more than ONE answer*)** 1. Reduce salt intake [ ] 2. Avoid shouting [ ] 3. Praying [ ] 4. Checking blood pressure regularly [ ] 5. Taking hypertension medicines [ ] 6. Avoiding fighting [ ] 7. Avoiding smoking [ ] 8. Avoiding taking alcohol [ ] 9. Drinking too much water [ ] 10. Engaging in regular exercise [ ]

22. Which of the following can predispose someone to hypertension?

S/N	Risk Factors	Yes	No	Don't know
1.	Tobacco consumption			
2.	Excessive salt intake			
3.	Alcohol consumption			
4.	Obesity			
5.	Stress			
6.	Physical inactivity			
7.	Inadequate consumption of fruits and vegetables.			

23. Which one of the following may apply in hypertension? (*You may choose more than ONE answer*) 1. Hypertension has no known cause [ ] 2.What a person eats could be a factor that may contribute in establishing hypertension [ ] 3. Sustained stress may be involved in establishing hypertension [ ] 4.Poor medication taking may result in poor control of blood pressure [ ].

SECTION D: PERCEPTION OF ADOLESCENTS

Instruction: For each of these statements in the table below, please indicate your responses.

S/N	STATEMENT	YES	NO	DON'T KNOW
24.	Hypertension is not common among adolescents			
25.	Hypertension is detectable among adolescents.			
26.	I am inclined to believe that there is no serious risk of a Hypertensive event if I miss my medication.			
27.	I have not thought of hypertension as a serious health condition requiring serious medical attention.			
28.	Adolescents cannot have hypertension because they are young.			
29.	Every person can experience the complications of hypertension as a result of not taking appropriate medications.			
30.	Emotional stress cannot lead one to hypertension.			
31.	I have confidence that the medications taking can control blood pressure.			
32.	Routine blood pressure is necessary for adolescent to know if they have high blood pressure.			
33.	Adolescents should not be really bothered about hypertension because it will go away with time.			
34.	Use of traditional herbs is better to treat hypertension than western medicines.			

SECTION E: DETERMINATION OF RISK FACTOR PREDISPOSING TO HYPERTENSION

Instruction: In this section Please tick in the appropriate boxes that correspond to your answers or complete the spaces provided below

Tobacco Consumption

35a. Do you currently smoke cigarettes? 1. Yes [ ] 2. No [ ] If No, move to question 41.

35b. At what age did you start smoking? _____ (in years).

36. Is cigarette smoking harmful to your health? 1. Yes ( ) 2. No ( )

37a.What brand/brands of cigarette do you smoke? 1_____2._____

37b.Why do you have preference for this brand? _____

38. In the last 24 hours, how many cigarettes did you smoke? _____ CIGARETTES.

39. In the last 7 days, how many cigarettes did you smoke? _____CIGARETTES.

40. What makes you to smoke? (Tick as many as appropriate) 1. For satisfaction [ ] 2. For pleasure [ ] 3. To get rid of worries [ ] 4. To get rid of anger [ ] 5. Others (please specify) _____.

41. Who of these people have suggested smoking to you in the time past? 1. Father/Mother [ ] 2. Uncle/Aunt [ ] 3. Brother/Sister [ ] 5. Master [ ] 6. Neighbor [ ] 7. Co-apprentice/Friends [ ] 8. Social network [ ] 9. None [ ] 10. Others (please specify) _____.

42. Apart from cigarettes, what other substances do you smoke? _____.

43. What type of health problems have you experienced as a result of tobacco consumption?

1. Coughing [ ] 2. Sneezing [ ] 3. Headache [ ] 4. Chest pain [ ] 5 Ulcer [ ] 6. Difficulty in breathing [ ] 7. None ( ). **Please go directly to Question 45a.**

44. Reasons for not smoking. 1. My parent/master/friends are against it [ ] 2. I don't like it [ ] 3. My religion is against it [ ] 4. It is not good for my health [ ] 5. I don't want to have high blood pressure [ ] 6. No reason [ ]

Alcohol Consumption

45a. Have you ever taken alcohol? 1. Yes [ ] 2. No [ ]. **If No, move to question 53.**

45b. If Yes, how old were you when you first drank alcohol? 1. _____ years old. 2. Forgotten how old I was_____

46. Have you ever drunk an alcohol-containing beverage? 1. Yes [ ] No [ ]

47a.What brand/brands of alcohol do you take? 1_____ 2._____

47b. Why do you have preference for these brands? _____

48. In the last 3 months, on how many days did you drink an alcohol- containing beverage?

(IF EVERY DAY, RECORD '90'). _____NUMBER OF DAYS.

49. Have you ever gotten "drunk" from drinking an alcohol-containing beverage? 1. Yes [ ] 2. No [ ]

50. During the past 7 days, how many bottles of alcohol did you drink? _____ Bottles

51. Who of the following influences your taking of alcohol?

S/N		Yes	No	Don't know	Most major influencer.
1.	Radio/Television				
2.	News paper/Poster/Leaflet				
3.	Social Network				
4.	Parents/Brothers/Sisters/Relatives				
5.	Co-apprentice/Friends				
6.	Religious Leaders				
7.	Master				
8.	Health workers				
9.	Others (please specify)				

52. What type of health problems have you experienced as a result of alcohol consumption? 1. Vomiting [ ] 2. Blurred vision [ ] 3. Headache [ ] 4. Injury [ ] 5. Dizziness [ ] 6. Fever [ ] 7. None [ ] **Please go directly to question 54.**

53. Reasons for not drinking alcohol 1.My parent/master/friends are against it [ ] 2. I don't like it [ ] 3. My religion is against it [ ] 4. It is not good for my health [ ] 5. I don't want to have high blood pressure [ ] 6. No reason [ ].

Diet

54. Will you rate yourself as being 1.Underweight [ ] 2. Normal [ ] 3. Obese [ ] 4. Over-weight [ ]

55. What are the type(s) of food you eat frequently?

S/N	Type of Food eat	Frequency of eating		
		Daily	Weekly	Monthly
1.	Starchy foods (Rice, Garri, Eba, Semo, Wheat, Potatoes, Fufu, Indomie/Spagetti, Bread, Amala, Yam, Pounded Yam, Pap etc)			
2.	Protein (Beans, Moinmoin/Akara, Fish/Meat,egg, etc)			
3.	Foods containing fats and sugar (Snacks, Biscuit, soft drinks etc)			
4.	Dairy product (Milk, Yoghought etc)			
5.	Fruits and Vegetable			

56. How would you rate your consumption of fatty foods? 1. I eat a Lots of fatty foods [ ] 2. I eat a Moderate fatty foods [ ] 3. I eat a Little fatty foods [ ] 4. I do not eat fatty food s at all [ ]

57. How much salt is in the food that you that you have been eating? 1. Lots of salt [ ] 2. Moderate salt [ ] 3. Little salt [ ] 4. No salt [ ]

58. Do you think that the consumption of fat can lead to obesity? 1 Yes [ ] 2. No [ ]

Stress

59. To what extent have you experienced the following work related stressors in the last 7 days?

S/N	Work related stressors	Very much	Moderately	Not at all
1	Operating under pressure at home			
2.	Operating under pressure at work			
3.	Trying to meet deadline at work			
4.	Inadequate funds to meet personal needs			
5	Argument with masters			

6	Insufficient recreation			
7.	Long working hours			
8.	Poor sleeping habit			
9.	Inability to obtain tools/equipment for working			
10.	Anxiety about incidents that could cause injury at work.			

60. What type of health problems have you experienced as a result of stress in the last one week (7days)? 1. Headache [ ] 2. Fever [ ] 3. Body pain [ ] 4. Injury [ ] 5. Dizziness [ ] 6. Body weakness [ ] 7. None [ ]

Physical Inactivity

61. Obesity can be caused by lack of physical activities. 1. Yes [ ] 2. No [ ]

62. Which of the following physical exercise facilities do you have in your workplace? 1. Table tennis [ ] 2. Football field [ ] 3. None [ ] 4. Volley ball court ( ) Others (please specify) _____

63. Which of the following activities have you engaged in the last 7 days and for how many hours?

S/N	Different types of physical activities	Yes	No	Hours per week
1	Walking			
2.	Football			
3.	Tennis			
4.	Snooker			
5.	Cycling			
6.	Skipping			
7.	Jogging			
8.	Running			
9.	Swimming			
10.	Volleyball			
11.	None of the above			

Thanks for participating in this study.

YORUBA TRANSLATION OF THE QUESTIONNAIRE

ZW{N *B#R

B7 Z8SZN @J@ RIRU XE GBIL@ LQZR1IK1N ZW{N _D+ ZK_S! {W_ ZTI Z EW% T(R+ M_ ON N& IJ{BA IB&L@ IBADAN NORTH EAST, N&L%^ *BZDZN, *P&NL@ +Y_

@yin ol6dzh6n m8,

Or5k[mi ni Akanbi Funmilola Adebunmi, mo j1 ak1k=- n7 2ka t8 ê m9j5t9 4t0 8lera, 8gb3ga zti ck[ni [gbz ile] 8w0szn ti Fqsit8 8l5 *bzdzn. *d7 pztzk8 f5n ix1 8wqd87 y87 ni lati m[bi z8szn 2j2 r7ru xe gbil2 lqzrin zw[n =d- ak[s1 ow- zti ewu t9 s= m- [n n7 8j[ba *b7l2 *bzdzn North East, n7l56 *bzdzn, *p7nl2 +y-.

Ix1 iwadii y87 y09 rzn wq l-w- lqti le s4t0 t9 m-nyqn lori ona ti adinku yoo fi de ba z8szn 2j2 r7ru zti 4wu t9 wz nibc lqzrin zw[n =d- ak-s1 [w-, z r= y8n lqti bq wa l[w- sii ix1 8wqd87 y87, a si fi n da yin loju pe ohun 8dqnim= yin, 8dzh6n zti 4r0ngbz yin, k87 y90 lu jade rqrq, zyafi fun ix1 8wqd87 y87 nikan. Lqk09tqn, m= p3 0 ko nilo lqti k[oruk[rc sinu 8w3 ib34r4 y8n, x6gb-n jc olot9t[si zw[n 8dzh6n 8b34r4 rc, nitori pe if[w[s9w[p= r2 ni yoo j1 ki asey[r7 ba ixc 8wqd87 y87.

J-w- fihzn b9yz o fc lqti k9pa tzbi o ko f1 nipa f7f8 zm8n y87 [√] s7n5 zp9t7 t9 wz n7szl2 y87.

1. B12ni ☐ 2. B12k- ☐

Zk7y4s7: j-w- dqh6n zw[n 8b34r4 w=ny87

ABALA A: ZLZY# N&PA *BQSEP+

1. Ir5 ix1 w0 l0 n k-? 1. Arqns[[ ] 2. Axe irun l1s=- tzb7 g1ri]g1r7 [ ] 3. Gb1nz]gb1nz [ ]

4. Onibzta [ ] 5. At90y6n 0y8nb- [ ] 6. On7x1 in1 m=nz]m-nq [ ] 7. A]t-k=xe [ ]

8. Zw[n m87rzn (J-w- k[ ) _____

2. Bqwo lo xe ê k-s1 rc? 1. Zxedal1 zk9k0 [ ] 2. F5n lqzrin zk9k0 rqnp1 [ ]

3. Kin ni ip0 8gb3yzw9 rc? 1. Mi o ti l9k[/n7yzw9 [ ] 2. Mo ti ni zf1s-nz/ti f1 s4gb3yzw9 [ ] 3. Mo ti l-k[/n7yzw9 [ ] 4. Op0 [ ] 5. A ti yapa [ ] 6. Z ti t5kq [ ] 7. A si j[n gbe pap= [ ]

4. *w3 m3l09 lo kz? 1. Mi 0 kzw3 [ ] 2. Ile iwe Alqk[b2r2 [ ] 3. Iwe girama k3ker3 [ ] 4. Girama zgbz [ ] 5 Zw[n m87rzn (J=w-k[)_____

5. K7n ni [d5n or7 rc, n7gbz t7 o xe [j- 8b7?.....(k=-ni [d5n)

6. @ya: 1. {k6nrinq [ ] 2. Igbo [ ] 3. Hausa

4. Zw[n m87rzn (J-w- k[)_____

7. $d4: 1. Yor6bq [ ] 2. Igbo [ ] 3. Hausa [ ] 4. Zw[n m87rzn (k[-)_____.

8. @s8n: 1. *gbzgb- [ ] 2. M6s6l6m7 [ ] 3. *b7l2[[ ]

4. Zw[n m87rzn_____

9. {d5n m3l09 lo ti l0 n7bi 8k-s1 y87?_____(Od5n).

10. $l9 l9 mqa n r7 l-s2, yqlz n7pas2 2b6n tzb7 =nz m87rzn #_____

11. G7ga_____m

12. *w5wo_____ kg

13.)s6w=n b7 ara xe ri _____kg/m^2

14.)s6w-n 2j2_____mmHg)s6nw-n 12j2

_____mmHg _____mmHg

)s6w-n iye zk-k-)s6w[n iye keji

ABALA B. *M+ N&PA @J@ R&RU

@j1 r7ru tzb7 rqnp2

15. @j2 r7ru k87 tzb7 mqa n fzrzhzn rqnp1 p2l5 z8szn.

16. @j2 r7ru le 4 gbe 8w0szn lo B12ni [ ] B12k- [ ]

17. A le 4 wo z8szn cjc reran r7gbz t7 k0 xi z8szn m[[n tzbi n7gbz t7 o n lo 00g6n.

    1. B12ni [ ] 2. B12k- [ ]

18. Zw[n wo l9 n xe p2l5 z8szn 2j2 r7ru?

    1. K7 8f5npq k3re [ ] 2. K7 8f5npq ga [ ] 3. Ki 8f5npq wz ni 8w=nt5nw=nsi

19. Zw[n ohun to nfa 2j2 r7ru ni? (o le m5 ju 8dqh6n ey[kan l[)

    1. Z8s8 ow- l-w- [ ] 2. S8gz m7mu [ ] 3. Zibal2 [kan [ ]

    4. Z8mq jc 4so zti ew1b2 d33d3[ ] 5. Z8 mq xe er3 7dqrayz d33de [[ ]

    6. Zisan 8bz [ ] 7. M7mu [t7 l7le [ ] 8. *dzm5 [ ]

    9. J7jc zw-n o5njc 0lorzz [ ] 10. J7jc iy= p5p= n7n5 o5njc [ ]

20. Zw[n zm8 zti z8szn 2j2 r7ru ni?

    1. Or87 f7f- [ ] 2. Ko oy8 mqa k- ni [ ] 3. Ki im5 mqa xe 2j2 [ ] 4. 34bi [ ]

    5. Ara r7ro [ ] 6. Airi oorun s6n [ ] 7. R7r6 [ ] 8. Ki oh6n mqa gb=n [ ]

    9. *dzm5 [ ] 10. Zy7padz 8ran [ ]

21. +nz zti d1kun 2j2 r7ru n8 w=ny7 (o le m5 ju 8dqh6n kan l[)

    1. D7d1kun 8y[p5p= n7n5 o5njc [ ] 2. D7d1kun ariwo p7pa [ ]

    3. Zd5rz [ ] 4. Y7yc 8f5npz w0 d33d3 [ ] 5. L7lo 00g6n z7szn 2j2 r7ru [ ]

    6. Y7yzg0 f5n 8jz [ ] 7. Ycra frn s7gq m7m5 [ ] 8. D1kun =t7 l7le [ ]

    9.Mu omi p5p= [ ] 10. Xe er3 8dqrayz d33d3[[ ]

22. Zw[n nnkan wo lo le j1 k7 4n8yzn ni z8szn 2j2 r7ru?

S/N	Ohun to n fzq	B12ni	B12k-	Mi 0 m=
1.	M7mu s7gq			
2.	Jijc iy= p5p=			

3.	M7mu [t7 l7le			
4.	S7san ara p5p=			
5.	Idqm5			
6.	Er3 8dqrayz			
7.	Z8mq le jc			
8.	$so ati we3b2			
9.	J1 3 de			

23. Zw[n wo l9 bq 2j2 r7ru mu? (O le mu ju *dqhun kan l[)

1. @j2 r7ru k0 ni 8w0szn [ ] 2. Ohun ti 4n8yzn bq jc le 4 fa z8szn 2j2 r7ru [ ]

3. z8bal2 [kzn le e fc z8szn 4j0 r7ru [ ] 4. *l0kul0 00g6n 0y8nb9 le 4 fa z8szn 2j2, r7ru. [ ]

ABALA C: $R)NGBZ ZW{N +D_

S/N	$R)NGBZ	B12ni	B12k-	M8 o m=
24.	A8szn 2j2 R7ru k9 w-p= lqzrin zw[n =d-			
25.	A8szn 2j2 R7ru w-p= lqzrin zw[n =d-			
26.	W-n j1 k7 n m= p3 k0 xi ewu n7bi z8szn, 2j2 r7ru, t7 n 0 bq lo 0og6n mi d33d3			
27.	Mi 0 l3r0 pe 2j2 r7ru lee fa z8szn t9 l3wu ti yoo n7l0 8t[ju k7qk7q			
28.	Zw[n [d[ko le mi z8szn 2j2 r7ru, n7tor7 p3 w-n s7 j1 =d-			
29.	K0 x7 cru ti k0 le ni z8szn 2j2 r7ru, ti o ba k[lqti mq lo 00g6n r2 d33d3			
30.	Z8sol4 okzn k0 le fa z8szn 2j2 r7ru.			
31.	Mo n7 igbzgb- pe lilo oogun le e d1kun z8szn 2j2 r7ru.			
32.	K7 zw[n =d- mqa szy2w0 ‘*f5npq w[n d33de, y90 j1 k7 w[n m[, b9yz w-n n7 z8szn 2j2 r7ru.			

33.	Ki zw[n =d- mq xe uy[ara w[n l1nu n7pa z8szn 2j2 r7ru nitori pe y90 l[f5nrz rc, n7gbz t9 bq yq lilo 00g6n 8b7l2 dara lqti x3t-j5 z8szn 2j2 r8ru ju ti 00g6n 9y7nb9 l[			
34	Lilo 0ogun ibile dara lzti set9ju aisan eje riru ju ti oogun oyinbo lo			

ABALA D: ZW{N NNKAN TO LE FA Z*SZN @J@ R&RU

S7gq m7mu

35a. Xe 0 n mu siga? 1. B12ni [ ] 2. B12k[[ ]

35b. {d5n m3l09 l9 wz n7gbz t7 o b2r2 s7gq m7mu?_____

36. Nj1 s7gq m7mu l3wu f5n ilera rc b7? B12ni [ ] 2. B12k- [ ]

37a. Ir5 s8gq wo l0 n mu? 1_____ 2._____

37b. K7 l9 d3 to n fi n mu ir5 s8gq b12?

_____

38. Lqzrin wqkzti mcrinlelogun t9 k[jq, s8gq m3l09 lo ti mu

_____

39. Lqzrin [j- m3je s1y8n, s8gq m3l09 lo to mu

_____

40. Ki l0 fa s8gq m7mu (o le m5 ju =kan) F5n 8t1l-r6n [ ] 2. (F5n 8gbzed6n [ ]

3. Lqti d1kun 8p0r5r5 =kan [ ] 4. Lqti d1kun 8b7n5 [ ] 5. Zw[n m87rzn

_____

41. Zw[n wo l9 gbz – n7m=rzn s1y8n, lqti mu s8gq

1. Bzbq/8yq mi [ ] 2. Zb5ro bzbq tgzb7 8yq [ ] 3. @gb-n ob8nrin/[k6nrin [ ] 4.)gq mi [ ] 5.Zlqd65gb0 [ ] 6. Zw[n ti a jc n k-s1 pzp=/=r1[ ] 7. L9r7 2r= k9l3]kqko [[ ] 8. K0 x7 8dqh6n n7bi [ ] 9. Zw[n m87rzn (k[-)_____

42. L1hy8n s8gz, zw[n nnkan wo, lo t5n mqa n mu_____

43. Zw[n z8lera wo lo mqa n ni, n7pa s98gq m7mu_____

1. Ik- [ ] 2. K7 4n8yzn mqa s7n [ ] 3. @f-r7 [ ]

4. Igbqzy0 d7d6n [ ] 5. K0 x7 8dah6n n7bi[[ ] J=w- l[s7 ib34r4 54.

44. K7n ni 4r4d7 t7, t7 o k0 fi mu s8gq

1. Zw[n 0b7 zti =r1 mi k0 n7f21 x7i [ ] 2. Mi 0 f1rzn r2 [ ]

3. @s8n mi l0di s7 [ ] 4. K0 dqra f5n 8lera mi [ ]

5. Mi 0 fq1 ni z8szn 2j2 r7ru [ ] 6. Mi 0 m= m7mu [t7 lile [ ]

45a. Nj1 o ti mu [t7 lile ri?

1. B12ni [ ] 2. B12k-[ ] (T9 bq jc b12k- j=w- l= dqh6n 8b34r4 54).

45b. T9 bq j1 b12ni, [m[[d5n m3l09 lo wz, n7gbz t7 o b2r2 lqti mqa mu [ti lile?_____

1. {m[[d5n_____ 2. Mi o rqnt7 iye [m[[d5n ti mo wz _____

46. Nj1 o ti mu [t7 l7le al-m bi? 1, B12ni [ ] 2. B12k- [ ]

47a. Ir5 [ti l7le wo lo mqa nmu?_____

47b. K7n ni 4r4d7 ti o fi yan ir5 [t7 b12 lzqy0_____

48. Lqzrin os6 m1ta s2y8n, [j- m34l9 lo ti mu zw[n =ti l7l0 ol9mi?_____T9 bq jq l9ooj5m[

49. Nj1 o ti mu zm6para n7gbz 0 n mui [t7 l7le bi? B12ni [ ] 2. B12k= [ ]

50. Lqzrin [j- m3je s1y8n, 8go [t7 l7le m3l09 lo ti mu?_____(*gb0 [t7)

51. Zw[n nnkan wo l9 j1 k7 o mqa m5 [t7 l7le?_____

52. Zw[n nnkan wo l9 j1 k7 o mqa m5 [t7 l7le? _____

S/N		B12ni	B12k-	Mi 0 m=	$y7 to rzn 9 l-w- jul[lqti mu [t7
1.	Redio/telifisan				
2.	*w3 8r0y8n, 8w3 zt2m9] 0g8r8, 7w3 pel3b3				
3.	@r= k9l3]k-l3				
4.	)b7, 2gb-n [k6nrin ob8nrin/Arq				
5.	Zwc t7 a j[n k-s1 pap= /=r-				
6.	Adar7 cl1s8n				
7.	+jq				
8.	)s8x2 el3t0 8lera				
9.	Zw[n m87rzn				

53. Ir5 z8lera wo, lo ti ni, n7pa m7mu [t7 lilo

1. 43b8 [ ] 2. Z8m= r7na tzzrz [ ] 3. @f-r7 [ ]
4. *farapa[ ] 5.)y8 [ ] 6. Z8szn ibz [ ]
7. Jok0 s7 8dqh6n n7bi [ ] j-=w- l[s7 ib34r4 55

54. *d7 t7 n k0 fi mu [t7 l7le. 1. Zw[n 0b7, =gq zti =r1 mi. k0 fqrzn r2 [ ]
2. Mi 0 f1ran r2 [ ] 3. @sin mi l0d8 s7i [ ] 4. K9 dqra f5n 8lera mi [ ]
5. Mo 0 f1 n7 z8szn 2j2 r7ru [ ] 6. K0 n7 8d7 kankan [ ]

55. Baw9 ni o xe r7 ara rc

1. Mo r6 [ ] 2. Mo wz pz [ ] 3. Mo sanra p5p= [ ]
4. Mo sanra j6 [[ ].

56. Or5 oo5njc wo l0 n jc d33d3?

S/N	Ir5 o5njc wo		B7 mo se n jc 1 si		
1.	O5njc 0k4l4 2 bz, znzm-, f5f5 s8pqg12t8, ixu, iyqn	*rcs8, Garri, S2m9, [kz bzbza ind9m8/B5r1d8, Zmzlz, 2k[abbl.			

2.	(unjc, afaral9kun (2wz m-inm-in/Zkzra, cja/cran, cyin abbl.				
3.	O5njdc t9 ni =rq zti s8gz (s7nzk8, Bis7k7ti, m7niras8 abbl.				
4.	O5njc, alqk[s7l2 (m7l7k8, y5g-=t8) abbl.				
5.	$s0 zti ew3b2				

57. K7n ni osuw[n ounjc [l-rzz t7 o n jc? 1. M9 mqa n jc ounjc ol-rzq gan an [ ]

2. Mo mqz n jc ounjc [l-rzw n7w=n t5nw=n s8 [ ]

3. *w=nbz ounq [l-rzq ni mo n jc [ ]

4. Emi k87 jc ounjc [l-rzq [ ]

58. K7n ni 0s6w=n 8y= t9 mqa n waz n7n5 o6njc t7 o mqa n jc? 1 .Iy= p5p= [ ]

2. `Iy= n7w=nt5n]w=ns8 [ ] 3. Iy= n7w=nba [ ]

4. $mi k87 jc iy= rqrq[ ]

59. X1 o r0 p3 iy= j7jc mqa n j1 k7 4n8yzn saara j6? 1. B12ni [ ] 2. B12k- [ ]

Z8bal2 [kzn

K7n ni 8r7s8 rc, n7pa ix1 t7 o n xe, t9 n m5 z8bzl2 [kzn wq lqzrin [j- m3je s1y8n?

1.	Zw[n ix1 il3 t9 n m5 z8bal2 ikzn deqni			
2.	Ix1 n7l3 ix1 t9 n fq z8bzl2 [kzn			
3.	Igb8yznju lqti xe ix1 n7bzmu p2l5 gb4d3ke zs8k0 t7 w-n lz s7l2			
4.	Z7l9w9t9 lqti ra zw[n nnkan t7 mo f1			
5.	Ar8yznjiyzn p2l5 0fg9 il3]8x1			
6.	Z7mqxe er3 8darayz d33d3			

7.	S7x3 ix1 as3ku or9gb9			
8.	Z8m- t4t4 ri oorun s6n			
9.	Z8mq ni irinx1 lati fi se ix1			
10.	*b2r6 pe mo le n farapa n78bi ix1			

60. Zw[n z8lera wo lo t8 n7, n7pa z8bzl2 [kzn lqzrin ([j[m3je s1y8n)?

1. @f-r7 [ ] 2 . Ibz [ ] 3. Ara riro [ ] 4. *farapa [ ]
5.)y8 k7k- [ ] 6. Z8l9kun [ ] 7. K0 s7 n7b2 rqrq [ ]

Zim9se Er3 *dqraya.

61. Zimz se er3 idqraya, mqa n j1 k7 4n8yzn sanra p5p=

1. B12ni [ ] 2. B12k- [ ]

62. Ir5 pqpq er3 8dqrayq wo lo ni nibi isx1 r2?

1. Er3 8dqrayq gba si mi] k7]n gba si [ ]
2. Pqpq ere b-=l6 alqfcs2 gbq [ ] 3. K0 s7 8dqh6n n7b2 [ ]
4. Pqpq er9 b-=l6 alqf[w- gbq [ ] 5. Zw[n nnkan m87rzn k[_____?

63. Zw[n er3 7dqrayq wo lo ti xe lqzrin [j- m3je s1y8n zti iye wqkzt7 t7 o xe 3?

S/N	Or7sir7xi er3 8dqrayq	B12ni	B12k[	Iye wqkzt7 l-s2
1.	F7fi cs2 rin			
2.	Er3 b-=l6 alqfcs2gbq			
3.	Er3 b-=lu gbigbz l9r7 tab7l8 (table tennis)			
4.	S7n5kz (snooker)			
5.	K2k2 w7wz			
6.	Ok6n f7fo			
7.	Er3 xix3			
8.	Er3 sisq			
9.	Omi w7w2			
10.	Er3 b-=l6 alqf[w-gbq			

11.	K0 s7 n7b2 rqrq			

C x3 p5p= f5n 8f[w-s-p= yin.