

**PREVALENCE AND FACTORS ASSOCIATED WITH  
HYPERTENSION AMONG EMPLOYEES AT  
MLOLONGO CALL CENTRE**

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**Prevalence and factors associated with hypertension among  
employees at Mlolongo call centre**

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**A thesis submitted in partial fulfilment for the degree of Master of  
Science in Public Health in the Jomo Kenyatta University of  
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## DECLARATION

This thesis is my original work and has not been presented for a degree in any other University

Signature ..... Date.....

**Joseph Onyango Mwagi**

This thesis has been submitted for examination with our approval as the university supervisors.

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## **DEDICATION**

My dedication goes to my wife Alice, daughters Cynthia and Elsie and my son Leslie for their support and prayers during the study period

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## **LIST OF ABBREVIATIONS/ACRONYMS**

|             |  |
|-------------|--|
| <b>ACA</b>  | Affordable Care Act                      |
| <b>BMI</b>  | Body Mass Index                          |
| <b>BPO</b>  | Business Process Outsourcing             |
| <b>COPD</b> | Chronic Obstructive Pulmonary Disease    |
| <b>HB</b>   | High Blood Pressure                      |
| <b>HBM</b>  | Health Belief Model                      |
| <b>HPP</b>  | Health Prevention Plan                   |
| <b>HPT</b>  | Hypertension                             |
| <b>IEC</b>  | Information, Education and Communication |
| <b>NCDs</b> | Non-Communicable Diseases                |
| <b>NHIF</b> | National Health Insurance Fund           |
| <b>RBS</b>  | Random Blood Sugar                       |
| <b>WHO</b>  | World Health Organization                |

## OPERATIONAL DEFINITIONS

- Anthropometric test:** Clinical nutritional assessments such as weight, height, body mass index among other parameters of general body functioning
- Blood Pressure:** The force of blood exerted on the inside of the walls of blood vessels. Blood pressure is expressed as a ratio (example 120/80). The first number is the systolic pressure which occurs when the heart pushes blood into the arteries. The second number is the diastolic pressure or the pressure when the heart goes into a resting phase.
- Body Mass Index:** A measure of the body fat that is a ratio of the weight of the body in kilograms to the square of its height in meters.
- Call Centre:** A customer service centre which handles inbound and out-bound telephone calls.
- Health and Wellbeing:** Refers to health promotion approaches aimed at early screening, identification and treatment of diseases and rehabilitation of long term chronic diseases
- Health risk factors:** Defined as anything that increases one's chances of getting a disease
- Hypertension:** Abnormally high arterial blood pressure that is usually indicated by an adult systolic blood pressure of 140mmhg or greater and a diastolic blood pressure of more than 90mmhg or greater.
- Modifiable health risk factors:** These refers to personalized and behavioral factors attributed to the onset of chronic diseases e.g. unhealthy

diet, Physical inactivity, harmful use of tobacco and excessive alcohol consumption

**Non- modifiable health risk factors:** Refers to factors beyond personal behavior e.g. age and genetics that contribute to chronic diseases

**Non-Communicable Diseases:** –A medical condition/disease that is non-infectious and non-transmissible. These refers to chronic diseases arising due to personal lifestyle modification options

**Prevalence:** Existing disease in a community

## ABSTRACT

Hypertension is one of the cardiovascular diseases classified as a Non-Communicable Disease (NCD). Among the predisposing factors are behavioral and lifestyle related factors such as poor diet, lack of physical exercise, too much stress, physical inactivity, tobacco smoking and excessive consumption of alcohol. This study determined the prevalence and factors associated with hypertension among call centre employees. This was a descriptive cross-sectional study design. Data collection was done in two parts. Part one comprised of clinical assessments measuring weight, height, Body Mass Index and blood pressure while part two comprised a questionnaire. Data was collected from a sample population of 400 respondents. Data analysis was done using descriptive method followed by bivariate analysis. Predisposing factors at  $p < 0.05$  were considered for multivariable analysis. Adjusted Odds Ratio (AOR) of 95% confidence Interval was calculated using binary logistic regression. Odds Ratio with 95% confidence interval was used to determine the strength of association. Total respondents were 400 with 34.9% male while 65.1% female. 25.1% of participants were obese, 53.0% pre-hypertension, 13.5% hypertension stage 1, with 16.2% hypertension stage 2. The proportion of hypertension was significantly higher among overweight respondents at 32.7% and 60.2% obese. Nine factors were associated with hypertension at bivariate analysis ( $P < 0.05$ ), these were reduced to four factors at multiple regression analysis using the reduced model. From the study findings, 30% of the respondents are at risk of developing hypertension. Four factors were identified as predisposing to hypertension: Respondents with increased Body Mass Index-both overweight and obese. Respondents who do not engage in physical activity, Respondents who consume excess fat in their diet and those respondents with parental responsibilities. Study findings depicts the need for interventions and greater emphasis on health promotion and well-being at the call centre. This calls for staff empowerment towards health seeking behaviors and adoption of healthy lifestyle options.

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background Information

The prevalence of Non-Communicable Diseases (NCD) in low- and middle-income countries is rising rapidly (WHO, 2010). Half of the current health burden in developing nations is attributable to non-communicable diseases. By 2020 it is projected that non-communicable diseases including, hypertension, will outstrip communicable diseases as the leading cause of death. Demographic changes, increasing urbanization and lifestyle changes are some of the factors contributing to the increasing burden of NCDs (Dalal et. al., 2014). Globally, nations have committed to reduce premature mortality arising from Non-Communicable Diseases (NCDs) by 25% by the year 2030 (WHO, 2010). This declaration was reached after WHO global report indicated that out of 57 million deaths, 36 million (63%) were due to non-communicable diseases mainly hypertension, stroke and heart attack, diabetes, cancer and chronic respiratory disease. Sadly, these are projected to reach 80% of major causes of death by the year 2030 (WHO, 2010).

Hypertension is a major contributor to NCD burden in both developed and developing countries (Kearney et. al., 2004). Hypertension is a primary cause of haemorrhagic and atherothrombotic stroke, hypertensive heart disease, hypertensive kidney failure, coronary artery disease (Carretero & Oparil, 2000). Hypertension is now the most common cardiovascular problem in Africa, and it is estimated that more than 20 million people are affected. In sub-Saharan Africa hypertensive end organ damage is a major source of morbidity and mortality (Walker et al., 2000) The reported prevalence of hypertension in Africa ranges from 25% to 35% in adults aged 25 to 64 years and increases with advancing age. A recent study of urban and rural Tanzania reported rates of stroke mortality higher than those of England and Wales and suggested that untreated hypertension is an important etiological risk factor (Walker et al., 2000). A large percentage of non-communicable diseases are preventable through the reduction of four main modifiable behavioural risk factors: unhealthy diet, physical inactivity, harmful use of tobacco and excessive alcohol

consumption. Among the adopted strategies are the ‘Alameda seven’ (Baicker, Cutler, & Song, 2010) which are linked with better health. These are eating healthy breakfast, maintaining proper weight, not snacking in between meals, never smoking cigarettes, regular physical activity, moderate or no use of alcohol and getting adequate and regular 7-8 hours of sleep (WHO, 2002)

## **1.2 Statement of the problem**

In the last two decades, Kenya has witnessed a very rapid economic growth. One of the most important factors related to this rising growth is advancement in technology. Business Process Outsourcing (BPOs) companies have mushroomed and are a visible concrete expression of this technological revolution. When a company concentrates on the core business and out sources its non-core activities like customer care services, then it is referred to as BPO. A call centre can be identified as the voice-based part of a BPO organization (Kunikullaya, Kirthi & Venkatesh, 2010).

Compared with other jobs, call centres attract fresh young graduates who are on the verge of starting their career are easily attracted by the lucrative salaries, lavish lifestyle, and other remuneration packages they offer (Chavan & Potdar, 2011). Call centres are transnational since they serve both domestic and international customers, Due to the difference in time zones between countries, most work is performed during night hours corresponding to a time suitable to their international customers. Such erratic work timings are often called “graveyard shift” by few researchers (Taylor & Bain, 1999). The burden of work associated with the different time zones can lead to personal ill-health as well as might result in anxiety and related disorders (Sudhashree, Rohit & Shrinivas, 2005).

Call centre employees are expected to express positive emotions and suppress negative emotions like frustration, resentment, and anger, in their interactions with customers to create a desired state of mind in the customer. If not given a healthy expressive outlet, this emotional repression can profoundly affect a person psychologically. Zapf et al. (2008) support this view and have indicated that in having to hide the call handlers’ true feelings, this would have negative consequences such as depression and anxiety (Sudhashree, Rohit & Shrinivas 2005).

Some of the commonly reported ailments among call center workers were backache, shoulder pain, digestive problems, overweight, headache due to eye strain and dryness of eyes (Lin et al., 2010).

Lin et al. (2010) describe call-time pressure as dealing with hostile customers, reading prescribed conversations on the phone endlessly and difficulty in providing good customer service. Occupational health experts opined that permanent night shift duties resulted in serious health concerns for call centre employees, wherein sleep disorders were observed among 83% as compared with industry average (Sudhashree, Rohit & Shrinivas, 2005). Burn out stress syndrome which included chronic fatigue, insomnia, and altered biological rhythm was also commonly observed among them (Suri et. al. 2007). A call centre study in Bangalore revealed that night shift workers have an increased risk of developing cardiovascular disease as compared with day shift workers (Mishra et. al., 2010). It further observed that 63% of employees had multiple addictions (smoking, chewing tobacco, alcohol, and other forms). Poor eating habits like skipping meals, over-eating, and excessive drinking of coffee and other beverages were also reported among call centre workers (Bhuyar et. al., 2008). Drug use and risky sexual behaviour were also apparent among call centre workers (Latha & Panchanatham, 2010). These were also associated with call centre employees adopting new lifestyle patterns like late night partying, smoking, boozing and staying away from family or live-in relationships

### **1.3 Justification of the study**

The call centre industry in Kenya is relatively a new development yet it has already been associated with a modern-day sweatshop. Mwendwa and Gitonga (2017) describe a call centre as a high-pressure and stressful work environment, characterized by highly routine work, lack of control, intensity of electronic performance monitoring, meeting of performance targets, absenteeism and high turnover. This study sought to determine the prevalence of hypertension among employees because of the job-demands of call centre employees). The burden of work and the erratic work timings in a call centre can lead to personal ill-health, anxiety and related disorders ((Sudhashree, Rohit & Shrinivas, 2005). According to

Loeppke and Edington (2010), nations have come together for a call of action towards prevention of NCDs such as hypertension. This study findings will be used to develop health promotion programs for employees working at the call centre. Although the call centre industry continues to grow, it is already experiencing high medical bills as compared to other departments (RAND, 2013). A view from Loeppke and Edington (2010) indicates that costs follow risks. A higher risk for any single factor is associated with higher medical costs, thus when individuals are grouped according to their health risk levels and age categories, those with higher risks are costlier to an organization. Therefore, as risks increase or decrease over time, changes in costs follow the same wavelength. The goal of this study is to move the call centre population into low risk, low-cost categories and maintain them there (Loeppke, 2008).

#### **1.4 Broad objective**

To determine the prevalence and factors associated with hypertension among employees working at Mlolongo call centre.

#### **1.5 Specific objectives:**

- i. To determine prevalence of hypertension among employees at the call centre
- ii. To establish factors associated with hypertension among employees at the call centre
- iii. To identify health seeking behaviours among employees to mitigate the risk of hypertension at the call centre.

#### **1.6 Research questions:**

- i. What is the prevalence of hypertension among employees at the call centre?
- ii. What are the factors associated with hypertension among employees at the call centre?
- iii. What are the health seeking behaviours among employees to mitigate the risk of hypertension at the call centre?

### **1.7 Significance of the study**

The study findings were to mitigate behavioural risks among the employees. The study findings were aimed at managing health care cost associated with hypertension at the workplace (Loeppke, Edington & Beg, 2010) through the implementation of recommended health promotion programs. The study findings were aimed at empowering employees at the call centre to embrace health and well-being initiatives and to adopt healthy lifestyle options.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Prevalence of Hypertension

Hypertension also known as high blood pressure is a global public health concern. It contributes to the burden of cardiovascular diseases, stroke, kidney failure and premature mortality (WHO, 2013). Hypertension rarely causes symptoms in early stages and many cases go undiagnosed. According to World Health Organization (2013) approximately 40 percent of adults aged 25 and above had been diagnosed with hypertension. Globally, the number of people with hypertension rose from 600 million in 1980 to one billion in 2008 (WHO, 2010) with high prevalence in Africa at 46 percent. Further the number of people with undiagnosed, untreated and uncontrolled hypertension are also high in lower and middle-income countries compared to high income countries (WHO, 2010). The World Health Organization estimates that 36 million of the 57 million deaths that occurred worldwide in 2008 were due to cardiovascular diseases making this the leading cause of death with a 63% mortality rate (WHO, 2008). Hypertension has been documented as the commonest risk factor for cardiovascular-related morbidity and mortality globally (Lim, Vos & Flaxman, 2012).

Hypertension is a major contributor to NCD burden in both developed and developing countries (Kearney et al., 2004). Hypertension is a primary cause of haemorrhagic and atherothrombotic stroke, hypertensive heart disease, hypertensive kidney failure, coronary artery disease (WHO, 2005). Hypertension remains an important public health challenge in the United States because it increases the risk for cardiovascular disease. Data from the National Centre for Health Statistics (Yoon, Fryar & Carrol, 2017) indicates that the prevalence of hypertension was 29.0% and increased with age. Hypertension prevalence was higher among non-Hispanic black (40.3%) than non-Hispanic white (27.8%), non-Hispanic Asian (25.0%), or Hispanic (27.8%) adults. In a study conducted in India, 51.4% call centre employees were found to be sleepier as compared with other workers 20.5%, (Suri et al., 2007). A study by Kunikullaya, Kirthi and Venkatesh (2010) revealed a that

night shift workers have an increased risk of developing cardiovascular disease as compared with day shift workers. Hypertension is now the most common cardiovascular problem in Africa, and it is estimated that more than 20 million people are affected (Whelton et al., 1995). In sub-Saharan Africa hypertensive end organ damage is a major source of morbidity and mortality (WHO, 2005). The reported prevalence of hypertension in Africa ranges from 25% to 35% in adults aged 25 to 64 years and increases with advancing age. A recent study of urban and rural Tanzania reported rates of stroke mortality higher than those of England and Wales, and suggested that untreated hypertension is an important etiological risk factor (Lim et al., 2012).

In Kenya estimates of hypertension prevalence, treatment and control are lacking. However, several recent studies have found that less than 20 per cent of urban, peri-urban and rural populations are aware of their hypertensive status, with less than half on treatment and even fewer with hypertension that is being consistently controlled. (KNBS, 2009). The prevalence or associated risk factors of hypertension in Kenya particularly in call centres is very limited. Published survey of 1986 was undertaken in a regional centre, among both rural and urban residents, reported non-standardized hypertension prevalence of 6.4% (Kastivo, 1991). Another cross-sectional study done in 2008, restricted to subjects aged over 50 years and conducted in predominantly urban population in Nakuru District, reported a prevalence of 50.1% (Mathenge, 2010). Similarly, a survey done in rural Kenya which included a sample of a specific target group composed of members of dairy farmer cooperatives and their families in the Nandi district, showed age-standardized prevalence of hypertension of 21.4% (Vijver et al., 2013).

## **2.2 Risk factors to hypertension**

Hypertension is categorized as either essential (primary) or secondary whereby essential hypertension is a rise in blood pressure with no identifiable cause that increases the risk of cerebral, cardiac and renal events (Carretero & Oparil, 2000). Although the cause is unknown, several factors including age, gender, obesity, lifestyle (diet, lack of physical activity), stress and genetic factors (Kearney et al.,

2004) increase the risk of developing essential (primary) hypertension. In secondary hypertension the elevated blood pressure is a result of an underlying medical condition or medication. Some of the causes of secondary hypertension include kidney diseases, disorders of endocrine glands including hyperthyroidism, medications such as corticosteroids and use of oral contraceptives (O'Brien, Beeves & Gregory, 2007) while secondary hypertension occurs in approximately 10% of hypertensive adults. According to World Health Organization (2010), the risk factors associated with hypertension are classified into four groups: behavioural risk factors, metabolic factors, social determinants and cardiovascular diseases.

### **2.2.1 Behavioural risk factors**

WHO (2010) defines behavioural risk factors associated with onset of hypertension are: Unhealthy diet, tobacco use, physical inactivity and harmful use of alcohol. There are several factors that increase the risk of hypertension:

### **2.2.2 Unhealthy diet**

High consumption of energy dense foods made of animal origin or processed food prepared with added fat, sugar and salt are major dietary risks to hypertension. Overweight or obesity and high cholesterol levels are some of the factors that increase the risk of hypertension (WHO, 2010). Poor eating habits like skipping meals, over-eating, and excessive drinking of coffee and other beverages are associated with factors (Sudhashree, Rohit & Shrinivas, 2005).

### **2.2.3 Physical Inactivity**

Cardiovascular diseases have been consistently associated with physical inactivity. These are hypertension, coronary heart disease, stroke, colon cancer, breast cancer, type 2 diabetes and osteoporosis. Physically inactive people are more likely to be obese which is a risk factor for many chronic diseases including high blood pressure (Ruseski, 2014).

#### **2.2.4 Addiction problems**

Tobacco use, and alcohol intake increases the risk of complications of hypertension (Carretero & Oparril, 2000). Approximately 2.3 million deaths occur each year from harmful use of alcohol. Alcohol consumption is associated with a wide range of health and social problems including acute myocardial infarction, unintended pregnancy and inter-personal violence. Smoking is estimated to cause about 71% of lung cancer, which is nearly 10% of non-communicable diseases (WHO, 2010). Smoking is the primary risk factor for chronic diseases such as emphysema and chronic obstructive pulmonary disease (COPD), as well as lung cancer.

Call centre employees are a distinct class in themselves and considered unconventional-night shift, a young employee base and western lifestyle. Characterised with high disposable incomes (Suri & Rizvi, 2008), the employees easily resorted to smoking and drinking, Smoking was considered by many to be a quick-fix solution to their stress problems. Latha and Panchanatham (2010) observed related multiple addictions (smoking, chewing tobacco, alcohol, and other forms) to hypertension. Drug use and risky sexual behaviour were also apparent among them.

#### **2.2.5 Physical and mental health factors**

Mwendwa and Gitonga (2017) describe call centre as a high pressure and stressful work environment. A call centre case-control study in New Delhi (Latha & Panchanatham, 2010) found that employees were more stressed, depressed and more anxious as compared with other workers. Higher levels of stress and anxiety of more than 65% have also been reported by researchers from call centres in other metropolitan cities (Suri & Rizvi, 2008). Various studies have reported a wide range of physical ailments among call centre workers. Backache, shoulder pain, digestive problems, overweight, headache due to eye strain and dryness of eyes were some of the commonly reported ailments (Bhuyar et al, 2008) According to a study in Mumbai, 70.4% females and 55.6% males were found to be suffering from headache almost every day (Mishra et al, 2010).

### **2.2.6 Sleep quality**

Most call centre workers work at times when they would normally be sleeping, this could challenge the individual's circadian rhythm because the sleep-wake internal clock setting is at odds with sleep wake cycle of the shift schedule ultimately resulting in circadian rhythm sleep disorders (Suri et al, 2007). Majority of workers in night duties are unable to sleep adequately during daytime and hence may develop cumulative sleep debt leading to significant sleep deprivation. Sleep deprivation can further complicate their health as it can result in fatigue, mood changes like depression, decreased cognitive functioning, poor executive functioning, impaired vigilance, and a predisposition to hypertension (Suri et al, 2007). Burn out stress syndrome which included chronic fatigue, insomnia, and altered biological rhythm was also associated with hypertension (Sudhashree, Rohit & Shrinivas, 2005)

### **2.2.7 Social deprivation**

Mishra et al. (2010) assert that call centre employment not only demand cultural transformation, nocturnal labour, and hours of monotonous work from its employees but also brings with it insecurities and vulnerabilities by diminishing their interpersonal familial and social interactions. They observe that many employees felt socially alienated, completely cut-off from their family and friends circuit owing to nocturnal labour. Some also complained of having little time to spend with their family members even though they were physically present at home during daytime. Latha & Panchanatham, (2010) found that 90% employees were not able to balance between their work and family life. Interestingly, the main hobby of most employees was to sleep for as long as they could due to the high fatigue levels of the night duties. Disruption in family life and lack of socialization due to odd shift timings were reported more among women employees as they had to balance between the dual burden of work and home.

### **2.2.8 Socio-demographic factors**

Ageing, education, urbanization and level/source of income are directly related to hypertension, heart attacks, strokes and heart failure (Ayah et al., 2014). The reported

prevalence of hypertension in Africa ranges from 25% to 35% in adults aged 25 to 64 years and increases with advancing age (Lim et al., 2010). A study of urban and rural Tanzania reported rates of stroke mortality higher than those of England and Wales and suggested that untreated hypertension is an important etiological risk factor (Lim et al. 2010). This was attributed to lack of awareness. Urbanisation is a key driver of the evolving hypertension in developing countries (Kearney et al., 2004). In Kenya 22.3% of the population is urban, with an urban population growth rate of 4.2% almost double the national population growth rate of 2.4% (Ayah et al., 2014). The consequences for societies and economies are devastating everywhere, but most especially so in aged, poor, vulnerable and disadvantaged populations. In developing countries such as Kenya, the level of income compared to the cost of care and treatment for hypertension is strenuous to both cash-paying and insured persons (Bovet et al., 2006). Non-communicable diseases deliver a two-punch blow to development (Loeppke, Edington & Beg, 2010). These cost billions of dollars in losses of national income, and push millions of people below the poverty line.

### **2.3 Health seeking behaviours that mitigate the risk of hypertension**

In the late 1960's and 1970's, preventive health was a prominent feature of healthcare reforms (Loeppke, 2008). Managed care organizations that flourished during that time introduced the concept of insurance coverage for services emphasising early screening, diagnosis, prevention and health promotion. Primary care providers were encouraged and often rewarded for attending to appropriate screening and preventive care. Consequently, healthy people program was initiated with attention to public health issues and established ten-year targets to improve population health management (Loeppke, 2008).

Traditionally, the effectiveness of preventive initiatives were gauged by assessing the changes in utilization of medical care costs (RAND, 2013). Employers have recognized the impact of other outcomes such as health related productivity, losses due to absenteeism and presenteeism.

Increasingly, proactive preventive care is viewed as both logical and necessary alternatives to traditional healthcare approaches (Loeppke, Edington & Beg, 2010)

Screening, health risk assessments, early diagnosis of chronic diseases and aggressive intervention in advance symptoms come at the lower costs with greater potential for positive outcomes. More than seventy five percent of healthcare spending is on people with cardiovascular diseases (WHO, 2008). These conditions are the leading causes of death and disability which would otherwise be prevented. World Health Organization (2010) has defined the need to develop a national database for screening of NCD's such as Hypertension.

#### **2.4 Signs and Symptoms of hypertension**

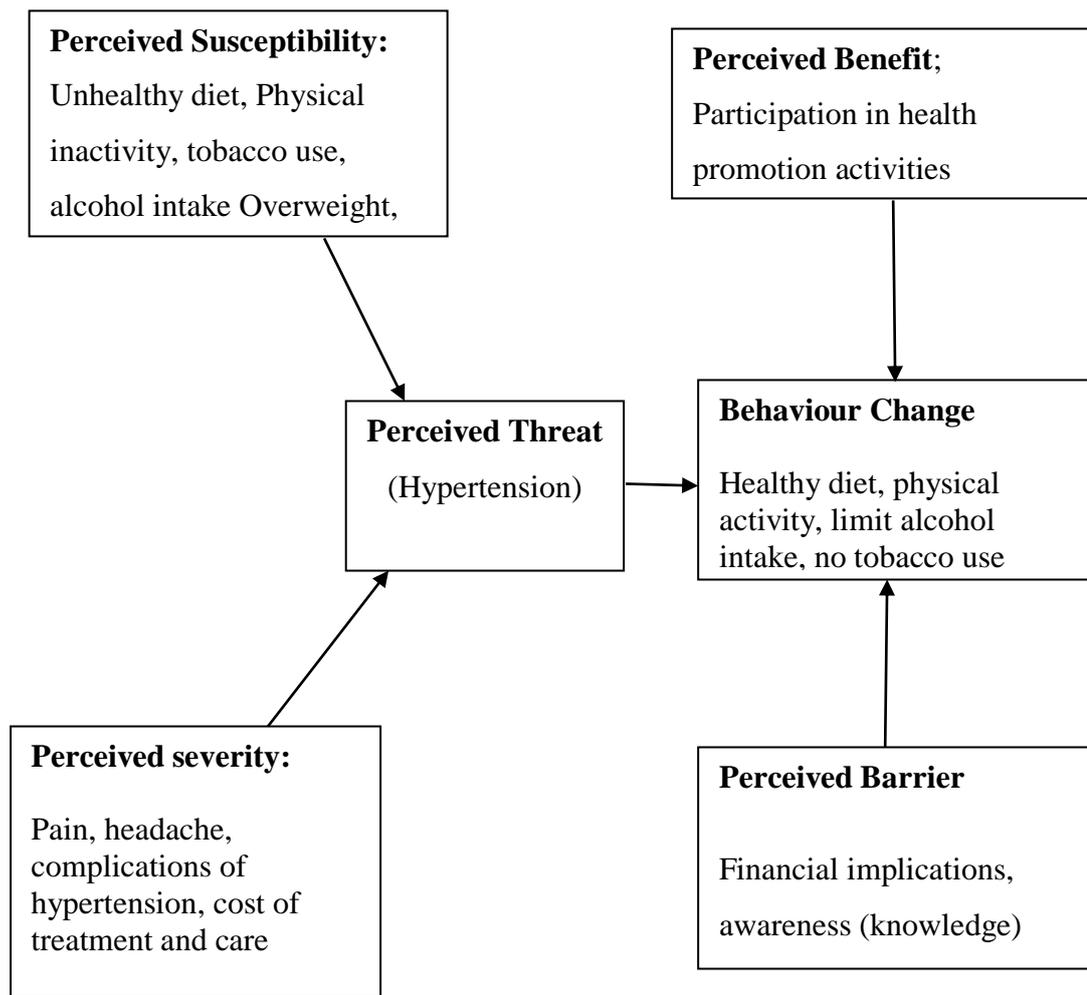
Hypertension was defined and classified as per the seventh report of the Joint National Committee (2003) on prevention, detection and treatment of high blood pressure as being systolic BP  $\geq 140$  mmHg and/or diastolic BP  $\geq 90$  mmHg. Hypertension was classified into pre-hypertension, stage 1 or 2 hypertension as per JNC VII 2013 standards (Williams, 2012). The Joint commission describes two categories of hypertension; essential hypertension as high blood pressure without a diagnosable cause, and secondary hypertension as high blood pressure that occurs because of another systemic disease such as kidney disease, adrenal gland over-activity, tumours, use of recreational drugs, thyroid gland dysfunction, aortic coarctation and pregnancy-related conditions. It is also an inheritable disease which can be inherited to children from parents having hypertension.

According to O'Brien, Beevers and Gregory (2007) blood pressure evaluation consists of a systolic (resulting from ventricular contraction) measurement and a diastolic (ventricular relaxation) measurement, both expressed in mmHg. Williams (2012) describes normal blood pressure as considered 120/80 mmHg. Pre-hypertensive is characterized by 120-139 systolic and 80-89 diastolic pressures. This stage is optimally treated with medication. Stage 1 hypertension is characterized by 140-159 systolic and 90-99 diastolic pressures. Levels above the stage 1 range qualify as stage 2 hypertension and medications are required to avoid a cardiac emergency. Most hypertensive people have no symptoms (WHO, 2013). However, hypertension is associated with symptoms such as headaches, shortness of breath, dizziness, chest pain, palpitations of the heart, blurred vision, fatigue, dizziness,

confusion, ringing sensation in the ears, difficulty in breathing, nose bleeding or irregular heartbeat which may lead to coma. Its complications are atherosclerosis or narrowing of arteries, brain haemorrhage or blood clot in brain, heart attack, aneurysm, kidney failure, heart failure, eye damage among others (Whelton et. al., 1995). Prevent of primary hypertension requires the adoption of healthy lifestyle options such as; avoid smoking, limiting alcohol intake, low sodium intake, low-fat and high-fibre diet, fruits and green vegetables, proper physical exercise, aerobics, healthy weight, regular pulse and blood pressure check, reduction of stress and low bad cholesterol level (Kearney et al., 2004)

## **2.5 Conceptual Framework for prevention of hypertension at the call centre**

The Health Belief Model (HBM) (Janz & Becker, 1984) originated in 1950s as a systematic method to explain and predict preventive health behaviour. Rosen stock's model focuses on two different aspects of health behaviour they are the perception of threat and behavioural evaluation. Besides threat perception and behavioural evaluation, "cues to action" component was also included in the HBM. "Cues to action" refers to triggers to change the likelihood of behaviours. HBM is composed of five factors (Hochbaum et al., 1952). Each factor in HBM theory and how it can be used in the prevention of cardiovascular diseases is described in figure 2.1.



**Figure 2.1: Health Belief Model Concept (Hochbaum & Rosenstock, 1952)**

In the Health Belief Model, the perceived seriousness and perceived susceptibility together are considered as perceived threat. Perceived severity is a verbal assessment of seriousness of the problem and what are the future consequences of it (Janz & Becker, 1984). Perceived susceptibility model foresees individuals who identify themselves as prone to hypertension to engage in behaviours to minimize their risk of developing hypertension (Janz & Becker, 1984). Employees who consider themselves at the high extreme of susceptibility take proper measures to prevent the hypertension.

Perceived benefits refer to an individual's assessment of the value or efficacy of engaging in a health-promoting behaviour to decrease risk of disease (Cao et al., 2014). Employees who believe that an action would decrease the susceptibility to a health issue or decrease the seriousness then the person would engage in a behaviour regardless of effectiveness of action. Perceived Barriers refer to an individual's estimation of the hurdle for behaviour change. In a life-threatening situation if an employee believes that an action will minimize the risk, then also barriers will prevent him from those actions. In modifying behaviour, the perceptions of each employee vary according to demographic characteristics and psychosocial variables (Morrongiello et al., 2013). The term perceptions include the perceived seriousness, susceptibility, benefits and barriers. The demographic variables can be age, sex, number of children in the house. Psychosocial factors include the family income, educational status and house facilities. Cues to action also referred to as a trigger can come from within or from outside. Internal cues can be pain. External cue can be information, advices and motivation from others (Cao et al., 2014). In the Health Belief Model “Perceived barriers” have proven to be the most powerful dimensions by various study designs and behaviours (Janz & Becker, 1984). Health Belief Model identifies an individual’s health risks and recommends a personalised program to mitigate associated risks (Loeppke, Edington & Beg, 2010)

## **2.6 Gaps to be addressed**

### **2.6.1 Determine prevalence of hypertension at the call centre**

To the best of my knowledge, by the time of this study, no study had been done in relation to the prevalence of hypertension in a call centre in Kenya. A recent study by Mwendwa and Gitonga (2017) discovered a high attrition rate of over 50% at a call centre in Kenya. This study sought to identify the prevalence of hypertension at a call centre due to the physical, mental and social challenges affecting employees at a call centre.

### **2.6.2 Guide in designing an employee driven health promotion program at the call centre.**

The World Health Organization (WHO, 2013) recommendation for the provision of full spectrum of health promotion services including health promotion, prevention, treatment, rehabilitation and palliative care to the intended population without financial constraints to the population. The Affordable Care Act (ACA) debate (DeVol et al., 2007) proposes a “Safeway model” namely, providing financial incentives for employees to engage in health promotion behaviours. Employers could vary insurance premiums by up to 20% to reward participation in various health promotion programs.

### **2.6.3 Need to contain the rising healthcare cost at the call centre**

Medical costs, patient claims and health insurance premiums have contributed to 47% rise in medical inflation in Kenya (Kigen, 2014). Further, the National Health Insurance Fund (NHIF) has also increased employees’ contributions by 600%. Consequently, medical claims surpassed commercial motor vehicle claims for the first time in the year 2013. Managing escalating healthcare costs depend on the adoption of healthy behaviours by employees in an organization (Loeppke, 2008).

### **2.6.4 Need to manage attrition rate at the call centre**

A call centre study in Kenya (Mwendwa, & Gitonga, 2017) revealed increased absenteeism and a high turnover rate exceeding 50% annually. This is characterized by high-pressure and stressful work environment, highly routine work, lack of control, intensity of electronic performance monitoring and meeting of performance targets. The study findings were intended to reduce the attrition rate by investing in employee centred programs to help them adapt and cope with the demands.

## **CHAPTER THREE;**

### **MATERIALS AND METHODS**

#### **3.1 Study area**

The study was carried out at Mlolongo call Centre situated at the border between Nairobi and Machakos County. The call centre has been in existence for the past 15 years. The call centre has workforce of 1600 employees. It serves both national and international customers estimated in the region of ten thousand customers daily. The call centre had three shifts with an average of four hundred employees per shift. The gender ratio at the call centre was one to one. Each employee had a minimum target of one hundred and fifty calls per shift. The remaining call centre staff were often on stand-by, reliver or away on leave. The call centre also served corporate clients, most of whom had their offices in Nairobi, the capital city of Kenya. Nairobi is a major business hub and many agencies are headquartered here as well. The call centre is situated along the Nairobi – Mombasa Highway, approximately 20km from the city centre.

#### **3.2 Study Population**

A total of 400 staff were recruited to participate in the study. The sampling list was drawn from the employee register. The study was conducted between June and December 2016 at an allocated room within the call centre's premise during weekdays from 8.00am to 4pm. A total of twenty participants were scheduled daily for a period of four weeks which translated to twenty working days

##### **3.2.1 Eligibility criteria**

The criteria for participation was defined into two: permanent staff giving consent to participate in the study. Those excluded from the study were pregnant mothers, temporary or contract staff, interns and permanent staff who refused to consent to the study

### 3.3 Study design

This was a descriptive cross-sectional study in which trained research assistants used standardized questionnaires to collect data on demographics, health risks behavior and exposure history to various potential risk factors for hypertension, A computer generated random sampling was used to select 400 participants/individuals from the register of eligible employees.

### 3.4 Sample size

The Fisher's exact test of sample size calculation (Jung, 2014) was used to calculate the minimum required sample size as follows:

$$n = \frac{(Z_{\alpha/2})^2 p(1-p)}{d^2}$$

Where

n= Minimum required sample size

$\alpha$ = Level of significance (0.05)

$Z_{\alpha/2}$ = Standard normal deviate at 95% CI (1.96)

P = Assumed prevalence of hypertension among employees at the call centre, (50%).

d= Absolute precision (Error margin), (0.05)

n =385 (Additional 15 participants were recruited to take care of non-respondents, (However all the 385 + 15 participants completed the study). Therefore, a total of 400 respondents participated and completed the study

### **3.4.1 Sampling procedure**

The sampling frame consisted of 1600 staff comprising a list of all the staff at the call centre. From the staff list, a sample size of 400 was selected using a computer generated random numbers.

## **3.5 Recruitment and Consenting**

### **3.5.1 Recruitment of respondents**

Participation in the study was on voluntary basis (opt in, opt out approach). Participant's consent to participate in the study was required as per the consent form (refer to appendix). The benefits and process of the study was explained to each participant by the research assistants. Confidentiality was upheld by use of codes for anonymity purposes.

### **3.5.2 Pre-testing**

Pre-test of the questionnaire was done initially at similar call centre set up. This process assisted in eliminating sensitive and irrelevant questions. Further, the question on safe sexual practices as a health seeking behavior was added. This process assisted in aligning the questionnaire with the study objectives and further determined the response time taken for each participant

## **3.6 Variables**

The study variables were divided into two: dependent and independent variables. The dependent variable was blood pressure (BP) measurement. The independent variables were divided into three: demographic factors, behavioral risk factors and anthropometric/ physical assessments. The demographic factors included age, gender, marital status educational level. Behavioral risk factors included diet, exercise, rest and sleep, alcohol consumption and tobacco smoking. The anthropometric tests included weight, height and Body Mass Index calculation

### **3.7 Data collection and management**

This was done in two (2) parts: structured questionnaire and the assessment of anthropometric tests. Research assistants underwent training on how to complete the STEPS questionnaire, anthropometric and blood pressure measurements.

#### **3.7.1 Data collection by use of questionnaire**

The questionnaire was administered by trained medical assistants supervised by a study coordinator. The questionnaire covered smoking habits, alcohol use and physical activity pattern, history of prior evaluation for diabetes and hypertension, medication and lifestyle issues. The questionnaire was used to collect data on behavioral risk factors and information on proposed health promotion programs. The questionnaire was developed from the emerging themes in the literature review according to the World Health Organization's stepwise surveillance format.

#### **3.7.2 Anthropometric tests**

The trained medical assistants, also recorded blood pressure (BP) and anthropometric measures; weight, height and Body Mass Index and blood pressure measurements. BP was recorded using a mercury sphygmomanometer (CDC, 2009). The sphygmomanometers, weighing scales and tape measures were assessed weekly by taking measurements of one person on each of the instruments to ensure they were standardized. Anthropometric measures were also recorded: height was measured to the nearest 0.5 cm using a metal measuring tape against a wall and a flat headboard at right angles to the wall. Weight was measured to the nearest 100gms using a bathroom scale (Ashton Meyers®). Body mass index (BMI) in kg/height in m<sup>2</sup>, was used as a measure of total body obesity.

#### **3.7.3 Data processing and analysis**

Data was entered into a computer database designed using MS-Access application. Data cleaning and validation was performed to achieve a clean dataset which was

then exported into a statistical package for social sciences (SPSS) version 20. Data backup was done regularly to avoid loss of data.

Data analysis was done in steps; Step one analysis involved stratification of specific behavioural health risk predisposing factors by (demography) individual characteristics (age, gender, education, marital status,). Further analyses included prevalence estimates for specific behavioural health risk predisposing factors (tobacco use, alcohol consumption, physical inactivity and low fruit and vegetable consumption), with reference to 95% confidence interval. Chi-square was used to test associations between individual characteristics and specific behavioural health risk predisposing factors at bivariate analysis. Odds Ratio with reference to 95% confidence interval was used to determine the strength of association. All individual characteristics identified to be significantly associated with specific behavioural health risk predisposing factor at  $p < 0.05$  during bivariate analysis were considered for multivariable analysis. Adjusted Odds Ratio (AOR) at 95% confidence interval was calculated using binary logistic regression, with reference to significant individual characteristics (age, gender, education, marital status).

Step two -Analysis of physical parameters considered prevalence estimates for specific anthropometric tests (overweight/obese and high blood pressure). 95% confidence interval was determined. Further stratification of the specific physically measured health risk predisposing factor was done by individual characteristics (age, gender, education, marital status) and specific behavioural health risk predisposing factor determined at Step one. The specific physically measured health risk predisposing factor (overweight/obese and high blood pressure) in relation to individual characteristics and specific behavioural health risk predisposing factor determined at step one was tested using Chi-square. Odds Ratio at 95% confidence interval was used to determine the strength of the association. All individual characteristics and specific behavioural health risk predisposing factors determined at step one, identified to be significantly associated with specific physically measured health risk predisposing factor (overweight/obese and high blood pressure) at  $p < 0.05$  during bivariate analysis was considered for multivariable analysis. Adjusted Odds Ratio (AOR) at 95% confidence interval was calculated using binary logistic

regression, where significant individual characteristics (age, gender, education, marital status) and specific behavioural health risk predisposing factor determined at step one was included simultaneously in the model, to assess the determinants of physically measured specific health risk predisposing factor (overweight/obese and high blood pressure). A p-value  $<0.05$  was considered as statistically significant.

Step three -analysis on existing health interventions during the period of study, the effect of these activities would be analysed for possible implementation at the call centre. Summary of responses were compared to the demographic representation (age, gender, education, marital status) as in step one. Percentage summary was presented in pie charts and graphs.

### **3.8 Ethical considerations**

Ethical approval for the study was obtained from Kenyatta National Hospital University of Nairobi Ethics and Research Committee (appendix 3). Informed consent from the eligible participants in the study were signed by the individual participants prior participation in the study (appendix 1). Confidentiality of participants and related information was upheld by use of codes on the questionnaires (appendix 2) to reduce chances of disclosure.

## **CHAPTER FOUR**

### **RESULTS**

#### **4.1 Respondents Rate**

A total of 400 employees working at the call centre consented to participate in the study, the number of participants was equivalent to the sample size. This represented 100% respondent rate. The results are presented in tables and graphs form.

#### **4.2 Socio-demographic characteristics of respondents**

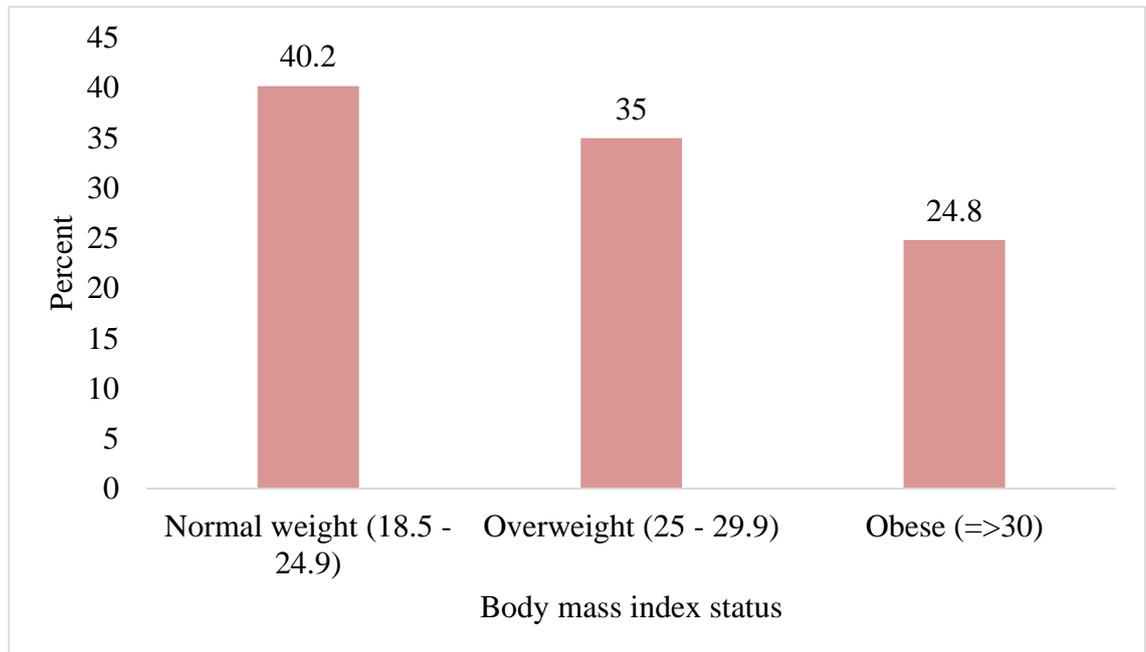
The distribution of selected socio-demographic characteristics of the respondents is shown in Table 4.1. Almost half of the respondents 49.0% were within the age group of 30-34 years followed by 23.5% aged between 35-39 years. Majority of the respondents 65.8% were females. With respect to marital status 59.6% of the respondents were married. Regarding level of education, more than half 50.2% were Bachelors Degree followed by 37.5% diploma graduates while there were 11.8% with a Masters degree.

**Table 4.1: Socio-demographic characteristics of the respondents**

| Characteristics                   | N=400 | %    |
|-----------------------------------|-------|------|
| Age in years                      |       |      |
| 18-24                             | 7     | 1.9  |
| 25-29                             | 66    | 16.5 |
| 30-34                             | 196   | 49.0 |
| 35-39                             | 94    | 23.5 |
| 40-44                             | 30    | 7.5  |
| 45-49                             | 7     | 1.8  |
| Gender                            |       |      |
| Male                              | 137   | 34.3 |
| Female                            | 263   | 65.7 |
| Marital Status                    |       |      |
| Single                            | 145   | 36.3 |
| Married                           | 238   | 59.6 |
| Separated                         | 8     | 2.0  |
| Divorced                          | 4     | 1.0  |
| Widowed                           | 1     | 0.3  |
| Others                            | 3     | 0.8  |
| Non-response                      | 1     | 0.0  |
| Level of education                |       |      |
| Diploma Graduate                  | 150   | 38.0 |
| Undergraduate (bachelor's degree) | 201   | 50.2 |
| Post Graduate (Masters' degree)   | 47    | 11.8 |
| Non-response                      | 2     | 0.0  |

#### 4.1.1 Distribution of body mass index among respondents

The highest proportion of the respondents 40.2% were classified as overweight followed by 35.0% normal weight and the remaining 24.8% were obese as shown in Figure 4.1.



**Figure 4.1: Distribution body mass index among respondents**

#### 4.3 Distribution of respondents by family history of chronic diseases

Many respondents 89.0%, 92.2% and 92.7% indicated that there were no family history of high blood sugar, paralysis and bleeding disorders respectively. Although 62.7% of the respondents reported no family history of high blood sugar, considerable percentage 33.6% indicated high blood pressure in the family. A high percentage of the respondents 46.1% pointed out that there was family history of some form of cancers. Most of the study participants 82.2% and (75.9%) indicated

no history of respiratory difficulty nor disorders in urine in the family respectively (Table 4.2).

**Table 4.2: Distribution of respondents by family history of chronic diseases**

| Variables  | N=400 | %    |
|--|-------|------|
| Family history of high blood sugar levels  |       |      |
| Yes  | 17    | 4.3  |
| No   | 355   | 89.0 |
| Do not Know  | 27    | 6.8  |
| Non-response   | 1     | 0    |
| Family history of high blood pressure  |       |      |
| Yes  | 133   | 33.3 |
| No   | 250   | 62.5 |
| Do not Know  | 16    | 4.0  |
| Non-response   | 1     | 0.2  |
| Family history of any form of cancers (e.g. cervical cancer in female or prostate cancer in males) |       |      |
| Yes  | 184   | 46.1 |
| No   | 200   | 50.1 |
| Do not Know  | 15    | 3.8  |
| Non-response   | 1     | 0    |
| Family history of respiratory difficulty (e.g. Asthma)   |       |      |
| Yes  | 50    | 12.5 |
| No   | 328   | 82.2 |
| Do not Know  | 21    | 5.3  |
| Non-response   | 1     | 0    |
| Family history of disorders in urine   |       |      |
| Yes  | 74    | 20   |
| No   | 307   | 75.9 |
| Do not Know  | 18    | 4.1  |
| Non-response   | 1     | 0    |
| Family history of paralysis of any part of the body  |       |      |
| Yes  | 4     | 1.0  |
| No   | 368   | 92.2 |
| Do not Know  | 27    | 6.8  |
| Non-response   | 1     | 0    |
| Family history of bleeding (Blood) Disorders e.g. Haemophilia                                      |       |      |
| Yes  | 13    | 3.2  |
| No   | 370   | 92.7 |
| Do not Know  | 16    | 4.0  |
| Non -response  | 1     | 0.1  |

#### 4.4 Medical history of chronic diseases among respondents

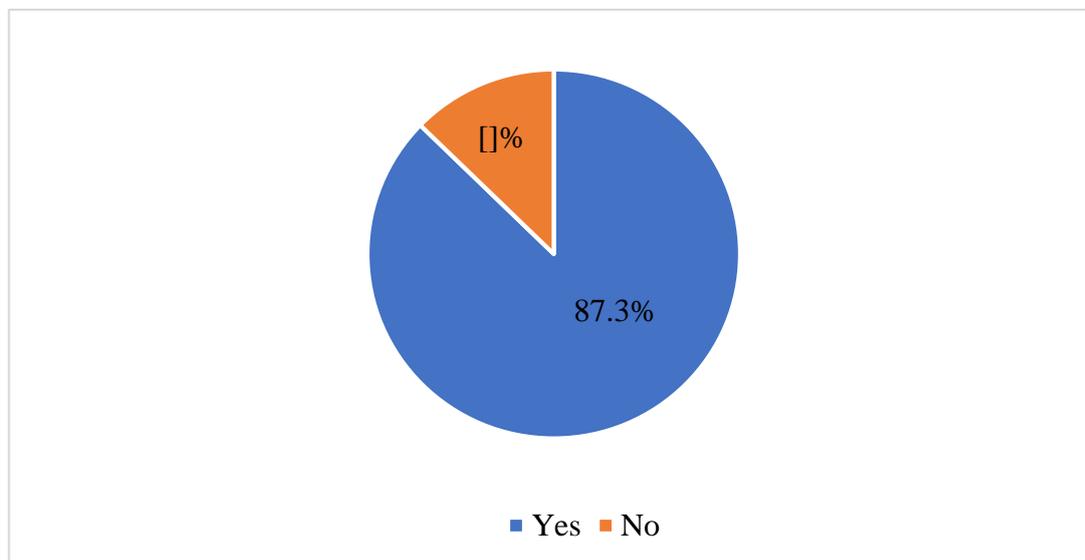
Table 4.3 shows the medical examination or screening for chronic diseases among the 400 employees. Majority of the respondents 86.0% have done a medical examination in the past 2 years. Those who did checkup for for blood pressure, blood sugar levels, body fat levels, body weight and difficulty in breathing were 13.8%, 7.8%, 10.3%, 10.3% and 8.6% respectively. The main reasons among those who have never done medical screening were lack of / exhausted the medical benefit 32.7% and 36.4% lack of personal interest.

**Table 4.3: Medical history of chronic diseases among respondents**

| Variables   | N=400 | %    |
|---|-------|------|
| Ever done a medical examination in the past 2 years                             |       |      |
| Yes   | 344   | 86.0 |
| No  | 56    | 14.0 |
| Reason(s) for not undertaking the health check-up (n=56)                        |       |      |
| Lack of Time  | 17    | 30.9 |
| Lack of Personal Interest   | 21    | 36.4 |
| Lack of Provision in the medical benefit  | 18    | 32.7 |
| Check up for blood pressure   |       |      |
| Yes   | 58    | 14.5 |
| No  | 341   | 85.5 |
| Non-response  | 1     | 0    |
| Check up for blood sugar levels   |       |      |
| Yes   | 32    | 8.0  |
| No  | 367   | 92.0 |
| Non-response  | 1     | 0    |
| Check up for body fat levels (Cholesterol)                                      |       |      |
| Yes   | 41    | 10.3 |
| No  | 358   | 89.7 |
| Non-response  | 1     | 0    |
| Check up for body weight (Obesity)  |       |      |
| Yes   | 42    | 10.5 |
| No  | 357   | 89.5 |
| Non -response   | 1     | 0    |
| Check up for difficulty in breathing (Respiratory tract infections e.g. Asthma) |       |      |
| Yes   | 38    | 9.5  |
| No  | 362   | 91.5 |

### 4.3.1 Proportion of respondents with history of medication for chronic illness

Figure 4.3 shows proportion of respondents who reported taking any medication for chronic diseases. Most of the respondents 87.3% were not taking any medication while 12.7% were taking medication for long term illness.



**Figure 4.2: Proportion of respondents on medication for chronic illnesses**

### 4.5 Food and eating habits among respondents

Table 4.4. shows that the highest proportion (41.0%) of the respondents were including fruits and vegetables in their diet followed by 36.3% respondents who indicated taking fruit and vegetables three times per week. 60.3% of the respondents indicated taking 1-2 litres of water per day. Similarly, 43.0% indicated that their largest meal of the day was during lunch followed by 35.6% dinner/supper. 53.3% reported that they sometimes add salt to the food. 57.5% of the respondents tried to reduce fat in their diet. However, 25.5% neither agreed nor disagreed and 17.0% disagreed on the same statement.

**Table 4.4: Food and eating habits among respondents**

| <b>Variables</b>  | <b>N=400</b> | <b>%</b> |
|---|--------------|----------|
| What is your daily water intake?  |              |          |
| More than 2 liters daily  | 97           | 24.3     |
| 1-2 liters daily  | 241          | 60.3     |
| Less than 1 liter daily   | 62           | 15.4     |
| How often do you include fruits and vegetables in your diet?                        |              |          |
| With every meal   | 28           | 7.0      |
| Daily (Once daily)  | 164          | 41.0     |
| At least three times a week   | 145          | 36.3     |
| Once a week   | 63           | 15.8     |
| Which is your largest meal of the day?  |              |          |
| Breakfast   | 83           | 21.4     |
| Lunch   | 167          | 43.0     |
| Dinner/Supper   | 138          | 35.6     |
| Do you add salt to your food during meals time, sometimes even before you taste it? |              |          |
| Never   | 157          | 39.3     |
| Sometimes   | 213          | 53.3     |
| Always  | 30           | 7.4      |
| Eat at least five servings of fruits and vegetables each day                        |              |          |
| Disagree  | 157          | 39.1     |
| Neither agree nor disagree  | 110          | 27.6     |
| Agree   | 133          | 33.3     |
| I often try to reduce fat in my diet  |              |          |
| Disagree  | 68           | 17.0     |
| Neither agree nor disagree  | 102          | 25.5     |
| Agree   | 230          | 57.5     |

#### **4.6 Distribution by type of physical exercise among respondents**

Table 4.5 below presents exercises done by respondents. 47.6% of the respondents were engaging in planned exercises 2-3 times per day. 12.5% engaged in planned physical activities daily. However, considerable percentage 21.8% were not engaged in any physical exercise. 50.4% indicated that they always sit at their desk all day and only leave when necessary. Jogging, 75.5% was the most common type of exercise reported by the respondents. However, swimming 9.0%, aerobics 17.8%, cycling 8.8% and weight lifting 12.0% were the least types of exercises. Though, 46.8% of the respondents claimed that they do take walking breaks at the work place, considerable percentage 36.9% indicated otherwise. More than half, 54.8% agreed on

engaging in more physical exercises and majority 67.2% agreed on maintaining a healthy body weight.

**Table 4.5: Physical exercises done by respondents**

| Variables  | N=400 | %    |
|--|-------|------|
| How often do you engage in a planned physical (exercise) activity?   |       |      |
| Daily  | 50    | 12.5 |
| Two to three times daily   | 191   | 47.6 |
| More than three times daily  | 72    | 18.0 |
| None   | 87    | 21.8 |
| Do you often sit longer hours and only leave when necessary?         |       |      |
| Never  | 30    | 7.5  |
| Sometimes  | 168   | 42.1 |
| Always   | 202   | 50.4 |
| Jogging  |       |      |
| Yes  | 302   | 75.5 |
| No   | 98    | 24.5 |
| Swimming,  |       |      |
| Yes  | 36    | 9.0  |
| No   | 364   | 91.0 |
| Aerobics/zumba dance   |       |      |
| Yes  | 71    | 17.8 |
| No   | 329   | 82.3 |
| Cycling  |       |      |
| Yes  | 35    | 8.8  |
| No   | 365   | 91.3 |
| Weight lifting   |       |      |
| Yes  | 48    | 12.0 |
| No   | 352   | 88.0 |
| I often take walking breaks at the work place/ including stair walks |       |      |
| Disagree   | 147   | 36.9 |
| Neither agree nor disagree   | 65    | 16.3 |
| Agree  | 186   | 46.8 |
| Engage in more physical exercises/ activities                        |       |      |
| Disagree   | 62    | 15.4 |
| Neither agree nor disagree   | 119   | 29.8 |
| Agree  | 219   | 54.8 |
| Maintain a healthy body weight                                       |       |      |
| Disagree   | 34    | 8.5  |
| Neither agree nor disagree   | 97    | 24.3 |
| Agree  | 269   | 67.2 |

#### 4.7 Alcohol and tobacco use among respondents

Respondents were asked to indicate whether they were consuming any form of alcoholic drink and more than half 55.0% were taking alcohol. Among those who were taking any form of alcohol, two thirds 71.5% were consuming at the end of month whereas those who used to take in weekly and every fortnight were 16.1% and 12.4% respectively. Large percentage 95.3% indicated that they have never smoked tobacco cigarettes in the last 30 days. About three quarters 71.7% agreed that they always avoid tobacco smoke or quit smoking (Table 4.6).

**Table 4.6: Alcohol and tobacco use among respondents**

| <b>Variables</b>   | <b>N=400</b> | <b>%</b> |
|--|--------------|----------|
| Do you consume any form of alcoholic drink (e.g. beer, wine)?        |              |          |
| Yes  | 220          | 55.0     |
| No   | 180          | 45.0     |
| How often do you have a drink containing alcohol? (n=220)            |              |          |
| Every Fortnight  | 28           | 12.4     |
| Weekly   | 35           | 16.1     |
| End Month  | 157          | 71.5     |
| In the last 30 days, have you smoked one or more tobacco cigarettes? |              |          |
| Yes  | 16           | 4.0      |
| No   | 381          | 95.3     |
| Non-response   | 3            | 0.7      |
| I often avoid tobacco smoke or quit smoking                          |              |          |
| Disagree   | 97           | 24.3     |
| Neither agree nor disagree   | 15           | 3.7      |
| Agree  | 284          | 71.0     |
| Non-response   | 4            | 1.0      |

#### **4.8 Health seeking behaviours among respondents**

Majority of the respondents 69.7% did not seek regular guidance/ consultation with their psychologist or counsellor. There were 21.3% who were visiting health consultant while 54.9% did not visit at all and 23.8% were visiting sometimes. The highest percentage of respondents 39.8% and 65.1% never undertook cancer screening tests and heart function test respectively. Only 31.8% were screening for cancer regularly and 34.0% for heart function test. Majority of the respondents 78.9% were not enrolled into a disease management plan. About half 47.1% were reading more articles on health issues and majority 78.0% preferred reading health tips including healthy dietary patterns, effective workout or exercise patterns, personal hygiene. About half of the respondent 50.3% did not network with focused groups on well-being and highest proportion 42.3% were not attending health sessions on topical issues of concern (Table 4.7)

**Table 4.7: Health seeking behaviours among respondents**

| <b>Variables</b>  | <b>N=400</b> | <b>%</b> |
|---|--------------|----------|
| Seek regular guidance/ consultation with you psychologist or counsellor                                     |              |          |
| Yes   | 62           | 15.5     |
| Sometimes   | 59           | 14.8     |
| No  | 279          | 69.7     |
| Visit a health consultant   |              |          |
| Yes   | 85           | 21.3     |
| Sometimes   | 95           | 23.8     |
| No  | 220          | 54.9     |
| Undertake cancer screening tests, e.g. Prostate, cervical etc.  |              |          |
| Yes   | 127          | 31.8     |
| Sometimes   | 114          | 28.5     |
| No  | 159          | 39.8     |
| Undertake prescribed vaccinations   |              |          |
| Yes   | 136          | 34.0     |
| Sometimes   | 67           | 16.8     |
| No  | 197          | 49.3     |
| Undertake a heart function test   |              |          |
| Yes   | 91           | 22.9     |
| Sometimes   | 48           | 12.1     |
| No  | 261          | 65.1     |
| Enrol into a disease management plan  |              |          |
| Yes   | 45           | 11.3     |
| Sometimes   | 39           | 9.8      |
| No  | 316          | 78.9     |
| Read more articles on health issues   |              |          |
| Yes   | 188          | 47.1     |
| Sometimes   | 104          | 25.8     |
| No  | 108          | 27.1     |
| Attend health sessions on topical issues of concern, e.g., how to live healthy, maintaining a healthy heart |              |          |
| Yes   | 141          | 35.3     |
| Sometimes   | 90           | 22.5     |
| No  | 169          | 42.3     |
| Network with focused groups on well-being e.g. Building Healthy Families                                    |              |          |
| Yes   | 133          | 33.3     |
| Sometimes   | 66           | 16.5     |
| No  | 201          | 50.3     |
| Health Tips (healthy dietary patterns, effective workout/ exercise patterns, personal hygiene etc.)         |              |          |
| Yes   | 312          | 78.0     |
| No  | 88           | 22.0     |

#### 4.8.1 Safe sexual practices among respondents

Figure 4.3 depicts the distribution of safe sexual practices including HIV test among the respondents. Most of the respondents 82.2% were engaging in safe sexual practices with 67.7% under taking HIV test

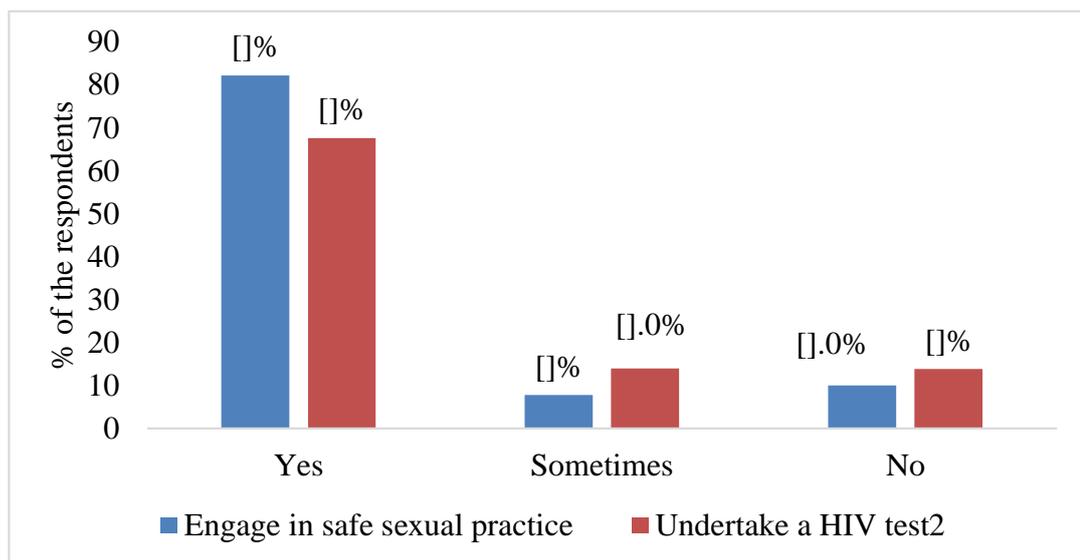


Figure 4.3: Safe sexual practices among respondents

#### 4.9 Life challenges and issues among respondents

Table 4.8 shows the distribution of respondents about daily life's challenges and issues. 41% had marital and relationship issues. Similarly, 38.3% had parenting issues, 40.3% had financial issues and 30.2% had work related issues while the remaining proportions indicated otherwise.

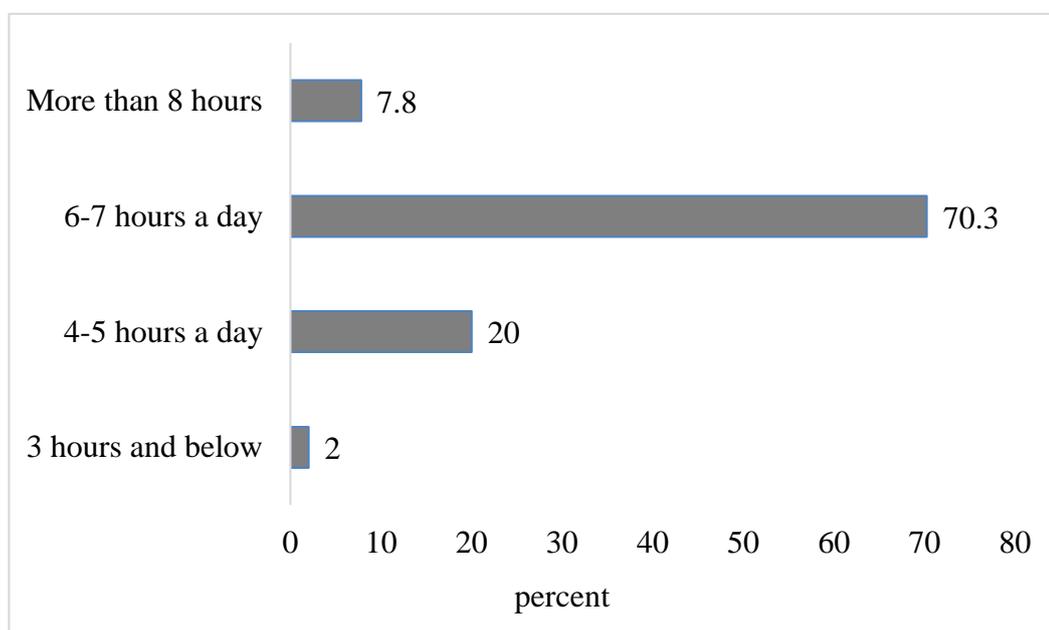
About three quarter 76.5% indicated that they balance between work and life. Although two thirds 67.3% pointed out that they had never felt that their health had been adversely affected by work, 32.7% had been affected by their work.

**Table 4.8: Life challenges and issues among respondents**

| <b>Variables</b>  | <b>N=400</b> | <b>%</b> |
|---|--------------|----------|
| Marital and relationship issues   |              |          |
| Yes   | 164          | 41.0     |
| No  | 236          | 59.0     |
| Parenting issues  |              |          |
| Yes   | 154          | 38.5     |
| No  | 246          | 61.5     |
| Family Issues   |              |          |
| Yes   | 77           | 19.3     |
| No  | 323          | 80.7     |
| Finances issues   |              |          |
| Yes   | 163          | 40.7     |
| No  | 237          | 59.3     |
| Work Related Issues   |              |          |
| Yes   | 122          | 30.2     |
| No  | 278          | 69.8     |
| Work life balance   |              |          |
| Yes   | 306          | 76.5     |
| No  | 94           | 23.5     |
| Financial literacy  |              |          |
| Yes   | 289          | 72.3     |
| No  | 111          | 27.7     |
| Lifestyle Related Issues  |              |          |
| Yes   | 30           | 7.5      |
| No  | 370          | 92.5     |
| Personal well being   |              |          |
| Yes   | 234          | 58.5     |
| No  | 166          | 41.5     |
| Have you ever felt that your health has been adversely affected by your work? |              |          |
| Yes   | 130          | 32.7     |
| No  | 270          | 67.3     |

#### 4.9.1 Average sleeping hours among respondents

Figure 4.4 demonstrates the average sleeping hours per day and majority of the respondents 70.3% were sleeping 6 to 7 hours per day.



**Figure 4.4: Average sleeping hours among respondents**

#### 4.10 Prevalence of hypertension among respondents

According to Table 4.9, more than half of the respondents 51.7% were classified as pre-hypertensive followed by normal blood pressure 19.3%, hypertension stage one was 14.0% while hypertension stage two at 15.0%. The prevalence of hypertension in this study was found to be 29.3%.

**Table 4.9: Classification and prevalence of hypertension among respondents**

| Variables             | N=400 | %    |
|-----------------------|-------|------|
| BP classification     |       |      |
| Normal Blood Pressure | 77    | 19.3 |
| Prehypertension       | 207   | 51.7 |
| Hypertension Stage 1  | 56    | 14.0 |
| Hypertension Stage 2  | 60    | 15.0 |
| Hypertension          |       |      |
| Hypertension          | 117   | 29.3 |
| No Hypertension       | 283   | 70.7 |

**4.11: Socio-demographic factors associated with hypertension among respondents**

Table 4.10 shows the bivariate analysis of association between selected socio-demographic characteristics and hypertension. 51.4% respondents aged 40 to 49 years were significantly more likely to develop hypertension [OR=3.23; 95%CI=1.40 – 7.44; P=0.006] compared to 24.7% respondents aged 18 to 29 years. There was a significant association between body mass index classification and hypertension status. The proportion of hypertensives was significantly higher among 33.5% overweight respondents [OR=13.63; 95% CI=5.27 - 35.26; P<0.001] and 58.6% obese respondents [OR=38.20; 95% CI=14.36 – 101.58; P<0.001] compared to 3.6% respondents who were within normal range of weight

**Table 4.10: shows the bivariate analysis of association between selected socio-demographic characteristics and hypertension**

| Variables                           | Hypertensive,<br>(N=117) |       | No hypertension,<br>(N=283) |       | OR <sup>ψ</sup> | 95% CI <sup>φ</sup> |        | P<br>value* |
|-------------------------------------|--------------------------|-------|-----------------------------|-------|-----------------|---------------------|--------|-------------|
|                                     | n                        | %     | N                           | %     |                 | Lower               | Upper  |             |
| Age                                 |                          |       |                             |       |                 |                     |        |             |
| 18-29 Years                         | 18                       | 24.7% | 55                          | 75.3% | Reference       |                     |        |             |
| 30-39 Years                         | 80                       | 27.6% | 210                         | 72.4% | 1.16            | 0.64                | 2.10   | 0.615       |
| 40-49 Years                         | 19                       | 51.4% | 18                          | 48.6% | 3.23            | 1.40                | 7.44   | 0.006       |
| Gender                              |                          |       |                             |       |                 |                     |        |             |
| Male                                | 46                       | 34.1% | 89                          | 65.9% | 1.40            | 0.90                | 2.20   | 0.140       |
| Female                              | 70                       | 26.9% | 190                         | 73.1% | Reference       |                     |        |             |
| Marital Status                      |                          |       |                             |       |                 |                     |        |             |
| Single                              | 45                       | 31.0% | 100                         | 69.0% | Reference       |                     |        |             |
| Married                             | 67                       | 28.2% | 171                         | 71.8% | 0.87            | 0.55                | 1.37   | 0.548       |
| Others (Separate, divorce, widowed) | 5                        | 31.3% | 11                          | 68.8% | 1.01            | 0.33                | 3.08   | 0.986       |
| Level of education                  |                          |       |                             |       |                 |                     |        |             |
| Diploma Graduate                    | 48                       | 32.0% | 102                         | 68.0% | Reference       |                     |        |             |
| Undergraduate (Bachelor's Levels)   | 53                       | 26.4% | 148                         | 73.6% | 0.76            | 0.48                | 1.21   | 0.249       |
| Postgraduate (Masters' Level)       | 16                       | 34.0% | 31                          | 66.0% | 1.10            | 0.55                | 2.20   | 0.794       |
| Body mass index classification      |                          |       |                             |       |                 |                     |        |             |
| Normal weight (18.5 - 24.9)         | 5                        | 3.6%  | 135                         | 96.4% | Reference       |                     |        |             |
| Overweight (25 - 29.9)              | 54                       | 33.5% | 107                         | 66.5% | 13.63           | 5.27                | 35.26  | <0.001      |
| Obese (=>30)                        | 58                       | 58.6% | 41                          | 41.4% | 38.20           | 14.36               | 101.58 | <0.001      |

\* Significant at p<0.05 bolded; <sup>ψ</sup> Odds ratio; <sup>φ</sup> 95% Confidence Interval

#### 4.11: Hypertension in relation to family history of chronic diseases among respondents

Table 4.7 shows there was significantly increased proportion of hypertension among respondents with family history of high blood pressure 36.1% [OR=1.71; 95% CI=1.09 - 2.70; P=0.021] than to those without family history of high blood pressure 24.8%.

**Table 4.11: Hypertension in relation to family history of chronic diseases among respondents**

| Variables   | Hypertensive, (N=117) |        | No hypertension, (N=283) |         | OR <sup>ψ</sup> | 95% CI <sup>φ</sup> |       | p value*     |
|---|-----------------------|--------|--------------------------|---------|-----------------|---------------------|-------|--------------|
|   | n                     | %      | n                        | %       |                 | Lower               | Upper |              |
| <b>Family history of increased blood sugar levels</b>   |                       |        |                          |         |                 |                     |       |              |
| Yes   | 6                     | 35.3%  | 11                       | 64.7%   | 1.37            | 0.49                | 3.81  | 0.544        |
| Do not Know   | 10                    | 37.0%  | 17                       | 63.0%   | 1.48            | 0.66                | 3.34  | 0.346        |
| No  | 101                   | 28.5%  | 254                      | 71.5%   | Reference       |                     |       |              |
| <b>Family history of high blood pressure</b>  |                       |        |                          |         |                 |                     |       |              |
| Yes   | 48                    | 36.1%  | 85                       | 63.9%   | 1.71            | 1.09                | 2.70  | <b>0.021</b> |
| Do not Know   | 7                     | 43.8%  | 9                        | 56.3%   | 2.36            | 0.84                | 6.60  | 0.102        |
| No  | 62                    | 24.8%  | 188                      | 75.2%   | Reference       |                     |       |              |
| <b>Family history of any form of cancers (e.g. cervical cancer in female or prostate cancer in males)</b> |                       |        |                          |         |                 |                     |       |              |
| Yes   | 62                    | 33.7%  | 122                      | 66.3%   | 1.41            | 0.91                | 2.18  | 0.125        |
| Do not Know   | 2                     | 13.3%  | 13                       | 86.7%   | 0.43            | 0.09                | 1.95  | 0.273        |
| No  | 53                    | 26.5%  | 147                      | 73.5%   | Reference       |                     |       |              |
| <b>Family history of respiratory difficulty (e.g. Asthma)</b>   |                       |        |                          |         |                 |                     |       |              |
| Yes   | 14                    | 28.0%  | 36                       | 72.0%   | 0.95            | 0.49                | 1.85  | 0.889        |
| Do not Know   | 8                     | 38.1%  | 13                       | 61.9%   | 1.51            | 0.61                | 3.76  | 0.377        |
| No  | 95                    | 29.0%  | 233                      | 71.0%   | Reference       |                     |       |              |
| <b>Family history of disorders in urine (Renal failure)</b>   |                       |        |                          |         |                 |                     |       |              |
| Yes   | 22                    | 29.70% | 52                       | 70.30%  | 1.12            | 0.64                | 1.96  | 0.683        |
| Do not Know   | 11                    | 61.1%  | 7                        | 38.9%   | 4.17            | 0.89                | 11.12 | 0.054        |
| No  | 84                    | 27.4%  | 223                      | 72.6%   | Reference       |                     |       |              |
| <b>Family history of paralysis of any part of the body</b>  |                       |        |                          |         |                 |                     |       |              |
| Yes   | 0                     | 0.00%  | 4                        | 100.00% | UD              | UD                  | UD    | 0.999        |
| Do not Know   | 9                     | 33.3%  | 18                       | 66.7%   | 1.20            | 0.52                | 2.76  | 0.662        |
| No  | 108                   | 29.3%  | 260                      | 70.7%   | Reference       |                     |       |              |
| <b>Family history of bleeding (Blood) Disorders e.g. Haemophilia</b>                                      |                       |        |                          |         |                 |                     |       |              |
| Yes   | 0                     | 0.00%  | 13                       | 100.00% | UD              | UD                  | UD    | 0.999        |
| Do not Know   | 7                     | 43.8%  | 9                        | 56.3%   | 1.84            | 0.67                | 5.06  | 0.239        |
| No  | 110                   | 29.7%  | 260                      | 70.3%   | Reference       |                     |       |              |

\* Significant at p<0.05 bolded; <sup>ψ</sup> Odds ratio; <sup>φ</sup> 95% Confidence Interval; UD= Undefined

#### **4.12 Hypertension in relation to food/eating habits among respondents**

Table 4.12 summarizes the analysis of the relationship between food/eating habits and hypertension. Respondents who did not eat at least five servings of fruits and vegetables each day had significantly increased proportion of hypertension 35.9% [OR=1.70; 95% CI=1.02 - 2.83; P=0.043] compared to 24.8% respondents who indicated otherwise. Similarly, there was increased proportion of hypertension among respondents who were not trying to reduce consuming fat in the diet 47.1% [OR=2.31; 95% CI=1.32 - 4.02; P=0.003] than to 27.8% who were always trying to reduce fat

**Table 4.12: Hypertension in relation to food/ eating habits among respondents**

| Variables   | Hypertensive,<br>(N=117) |       | No<br>hypertension,<br>(N=283) |       | OR <sup>ψ</sup> | 95% CI <sup>φ</sup> |       | p<br>value* |
|---|--------------------------|-------|--------------------------------|-------|-----------------|---------------------|-------|-------------|
|   | n                        | %     | n                              | %     |                 | Lower               | Upper |             |
| What is your daily water intake?  |                          |       |                                |       |                 |                     |       |             |
| More than 2 litres daily  | 29                       | 29.9% | 68                             | 70.1% | Reference       |                     |       |             |
| 1-2 litres daily  | 76                       | 31.5% | 165                            | 68.5% | 1.08            | 0.65                | 1.80  | 0.768       |
| Less than 1 litre daily   | 12                       | 19.4% | 50                             | 80.6% | 0.56            | 0.26                | 1.21  | 0.141       |
| How often do you include fruits and vegetables in your diet?                        |                          |       |                                |       |                 |                     |       |             |
| With every meal   | 7                        | 25.0% | 21                             | 75.0% | Reference       |                     |       |             |
| Daily (Once daily)  | 42                       | 25.6% | 122                            | 74.4% | 1.03            | 0.41                | 2.60  | 0.945       |
| At least three times a week   | 48                       | 33.1% | 97                             | 66.9% | 1.48            | 0.59                | 3.74  | 0.401       |
| Once a week   | 20                       | 31.7% | 43                             | 68.3% | 1.40            | 0.51                | 3.82  | 0.517       |
| Which is your largest meal of the day?  |                          |       |                                |       |                 |                     |       |             |
| Breakfast   | 29                       | 34.9% | 54                             | 65.1% | Reference       |                     |       |             |
| Lunch   | 45                       | 26.9% | 122                            | 73.1% | 0.69            | 0.39                | 1.21  | 0.193       |
| Dinner/Supper   | 37                       | 26.8% | 101                            | 73.2% | 0.68            | 0.38                | 1.23  | 0.202       |
| Do you add salt to your food during meals time, sometimes even before you taste it? |                          |       |                                |       |                 |                     |       |             |
| Never   | 49                       | 31.2% | 108                            | 68.8% | Reference       |                     |       |             |
| Sometimes   | 58                       | 27.2% | 155                            | 72.8% | 0.82            | 0.52                | 1.297 | 0.404       |
| Always  | 10                       | 33.3% | 20                             | 66.7% | 1.10            | 0.48                | 2.529 | 0.819       |
| Eat at least five servings of fruits and vegetables each day                        |                          |       |                                |       |                 |                     |       |             |
| No  | 56                       | 35.9% | 100                            | 64.1% | 1.70            | 1.02                | 2.83  | 0.043       |
| Sometimes   | 28                       | 25.5% | 82                             | 74.5% | 1.03            | 0.58                | 1.85  | 0.908       |
| Yes   | 33                       | 24.8% | 100                            | 75.2% | Reference       |                     |       |             |
| I often try to reduce fat in my diet  |                          |       |                                |       |                 |                     |       |             |
| No  | 32                       | 47.1% | 36                             | 52.9% | 2.31            | 1.32                | 4.02  | 0.003       |
| Sometimes   | 21                       | 20.6% | 81                             | 79.4% | 0.67            | 0.38                | 1.18  | 0.165       |
| Yes   | 64                       | 27.8% | 166                            | 72.2% | Reference       |                     |       |             |

\* Significant at p<0.05 bolded; <sup>ψ</sup> Odds ratio; <sup>φ</sup> 95% Confidence Interval

#### 4.13: Hypertension in relation to type of physical exercises done among respondents

Table 4.13 shows the association between the type of physical exercises and hypertension. Respondents who engage sometimes on more physical exercises engagement had significantly more proportion of hypertension 39.8) [OR=2.02; 95% CI=1.25 - 3.27; P=0.004] compared to 24.7% who were always engaged in more physical exercises

**Table 4.13: Hypertension in relation to type of physical exercise done among respondents**

| Variables   | Hypertensive,<br>(N=117) |        | No<br>hypertension,<br>(N=283) |       | OR <sup>ψ</sup> | 95% CI <sup>φ</sup> |       | p<br>value*  |
|---|--------------------------|--------|--------------------------------|-------|-----------------|---------------------|-------|--------------|
|   | n                        | %      | n                              | %     |                 | Lower               | Upper |              |
| <b>How often do you engage in a planned physical (exercise) activity?</b>   |                          |        |                                |       |                 |                     |       |              |
| Daily   | 15                       | 30.0%  | 35                             | 70.0% | 1.27            | 0.58                | 2.75  | <b>0.550</b> |
| Two to three times daily  | 56                       | 29.5%  | 134                            | 70.5% | 1.23            | 0.69                | 2.19  | <b>0.473</b> |
| More than three times daily   | 24                       | 33.3%  | 48                             | 66.7% | 1.48            | 0.74                | 2.94  | <b>0.267</b> |
| None  | 22                       | 25.3%  | 65                             | 74.7% | Reference       |                     |       |              |
| <b>Do you often sit at your desk all day and only leave when necessary?</b> |                          |        |                                |       |                 |                     |       |              |
| Never   | 6                        | 20.0%  | 24                             | 80.0% | Reference       |                     |       |              |
| Sometimes   | 53                       | 31.5%  | 115                            | 68.5% | 1.84            | 0.71                | 4.78  | <b>0.208</b> |
| Always  | 58                       | 28.9%  | 143                            | 71.1% | 1.62            | 0.63                | 4.17  | <b>0.316</b> |
| <b>Jogging / running</b>  |                          |        |                                |       |                 |                     |       |              |
| Yes   | 91                       | 30.1%  | 211                            | 69.9% | Reference       |                     |       |              |
| No  | 26                       | 26.5%  | 72                             | 73.5% | 0.84            | 0.50                | 1.40  | <b>0.496</b> |
| <b>Swimming,</b>  |                          |        |                                |       |                 |                     |       |              |
| Yes   | 11                       | 30.6%  | 25                             | 69.4% | Reference       |                     |       |              |
| No  | 106                      | 29.1%  | 258                            | 70.9% | 1.07            | 0.51                | 2.25  | <b>0.857</b> |
| <b>Aerobics/Zumba dance</b>   |                          |        |                                |       |                 |                     |       |              |
| Yes   | 18                       | 25.4%  | 53                             | 74.6% | Reference       |                     |       |              |
| No  | 96                       | 31.30% | 230                            | 69.9% | 1.27            | 0.71                | 2.27  | <b>0.427</b> |
| <b>Cycling</b>  |                          |        |                                |       |                 |                     |       |              |
| Yes   | 15                       | 42.9%  | 20                             | 57.1% | 1.93            | 0.95                | 3.92  | <b>0.068</b> |
| No  | 102                      | 27.9%  | 263                            | 72.1% | Reference       |                     |       |              |
| <b>Weight lifting</b>   |                          |        |                                |       |                 |                     |       |              |
| Yes   | 16                       | 33.3%  | 32                             | 66.7% | Reference       |                     |       |              |
| No  | 101                      | 28.7%  | 251                            | 71.3% | 0.80            | 0.42                | 1.53  | <b>0.508</b> |
| <b>I often take walking breaks at the work place/ including stair walks</b> |                          |        |                                |       |                 |                     |       |              |
| No (never)  | 48                       | 32.7%  | 99                             | 67.3% | 1.39            | 0.87                | 2.24  | <b>0.172</b> |
| Sometimes   | 20                       | 30.8%  | 45                             | 69.2% | 1.28            | 0.69                | 2.38  | <b>0.439</b> |
| Yes (always)  | 48                       | 25.8%  | 138                            | 74.2% | Reference       |                     |       |              |
| <b>Engage in more physical exercises/ activities</b>                        |                          |        |                                |       |                 |                     |       |              |
| No (never)  | 16                       | 25.8%  | 46                             | 74.2% | 1.06            | 0.56                | 2.03  | <b>0.854</b> |
| Sometimes   | 47                       | 39.8%  | 71                             | 60.2% | 2.02            | 1.25                | 3.27  | <b>0.004</b> |
| Yes (always)  | 54                       | 24.7%  | 165                            | 75.3% | Reference       |                     |       |              |
| <b>Maintain a healthy body weight</b>                                       |                          |        |                                |       |                 |                     |       |              |
| No (never)  | 10                       | 29.4%  | 24                             | 70.6% | 1.07            | 0.49                | 2.35  | <b>0.862</b> |
| Sometimes   | 32                       | 33.0%  | 65                             | 67.0% | 1.27            | 0.77                | 2.09  | <b>0.354</b> |
| Yes (always)  | 75                       | 28.0%  | 193                            | 72.0% | Reference       |                     |       |              |

\* Significant at p<0.05 bolded; <sup>ψ</sup> Odds ratio; <sup>φ</sup> 95% Confidence Interval

#### 4.14 Association of hypertension to substance use among respondents

Table 4.14 shows the bivariate analysis of association between substance use and hypertension. However, there was no significant association observed between the variables.

**Table 4.14: Association of hypertension to substance use among respondents**

| Variables   | Hypertensive, (N=117) |        | No hypertension, (N=283) |        | OR <sup>ψ</sup> | 95% CI <sup>φ</sup> |       | p value *    |
|---|-----------------------|--------|--------------------------|--------|-----------------|---------------------|-------|--------------|
|   | n                     | %      | n                        | %      |                 | Lower               | Upper |              |
| <b>Alcohol and Drug use</b>   |                       |        |                          |        |                 |                     |       |              |
| <b>Yes</b>  | 12                    | 30.0%  | 28                       | 70.0%  | 1.24            | 0.6                 | 2.6   | <b>0.561</b> |
| <b>No</b>   | 10                    | 29.2%  | 25                       | 70.8%  | Reference       |                     |       |              |
|   | 5                     |        | 5                        |        |                 |                     |       |              |
| <b>Do you consume any form of alcoholic drink (e.g. beer, wine)?</b>        |                       |        |                          |        |                 |                     |       |              |
| <b>Yes</b>  | 64                    | 29.1%  | 15                       | 70.9%  | 0.99            | 0.63                | 1.55  | <b>0.968</b> |
|   |                       |        | 6                        |        |                 |                     |       |              |
| <b>No</b>   | 53                    | 29.4%  | 12                       | 70.6%  | Reference       |                     |       |              |
|   |                       |        | 7                        |        |                 |                     |       |              |
| <b>How often do you have a drink containing alcohol? (n=204)</b>            |                       |        |                          |        |                 |                     |       |              |
| <b>Every Fortnight</b>  | 5                     | 35.70% | 9                        | 64.30% | 1.29            | 0.41                | 4.08  | <b>0.668</b> |
| <b>Weekly</b>   | 15                    | 27.80% | 39                       | 72.20% | 0.89            | 0.44                | 1.79  | <b>0.747</b> |
| <b>End Month</b>  | 41                    | 30.10% | 95                       | 69.90% | Reference       |                     |       |              |
|   |                       |        |                          |        |                 |                     |       |              |
| <b>In the last 30 days, have you smoked one or more tobacco cigarettes?</b> |                       |        |                          |        |                 |                     |       |              |
| <b>Yes</b>  | 3                     | 18.8%  | 13                       | 81.3%  | 0.69            | 0.19                | 2.56  | <b>0.679</b> |
| <b>No</b>   | 11                    | 29.7%  | 26                       | 70.3%  | Reference       |                     |       |              |
|   | 3                     |        | 8                        |        |                 |                     |       |              |
| <b>I often avoid tobacco smoke or Quit smoking</b>                          |                       |        |                          |        |                 |                     |       |              |
| <b>No (never)</b>   | 25                    | 25.8%  | 72                       | 74.2%  | Reference       |                     |       |              |
|   |                       |        |                          |        |                 |                     |       |              |
| <b>Sometimes</b>  | 6                     | 40.0%  | 9                        | 60.0%  | 0.8             | 0.46                | 1.37  | <b>0.412</b> |
| <b>Yes (always)</b>   | 85                    | 29.9%  | 19                       | 70.1%  | 1.61            | 0.5                 | 5.22  | <b>0.428</b> |
|   |                       |        | 9                        |        |                 |                     |       |              |

\* Significant at p<0.05 bolded; <sup>ψ</sup> Odds ratio; <sup>φ</sup> 95% Confidence Interval

#### **4.15 Association between selected health seeking behaviour and hypertension among respondents**

Table 4.15 shows the association between selected health seeking behaviour and hypertension. 41.7% of the respondents indicated undertaking heart function test sometimes [OR=1.95; 95% CI: 1.08-3.51; P=0.027] and 30.9% not at all [OR=3.11; 95% CI: 1.43-6.78; P=0.004] compared to 18.7% who indicated undertaking the test always. Respondents who rated network with focused groups on well-being as sometimes had significantly more proportion of hypertension 46.4% [OR=2.28; 95% CI: 1.22-4.25; P=0.009] than 25.6% who rated always.

**Table 4.15: Association between selected health seeking behaviour and hypertension among respondents**

| Variables   | Hypertensive, (N=117) |       | No hypertension, (N=283) |       | OR <sup>ψ</sup> | 95% CI <sup>φ</sup> |       | p value* |
|---|-----------------------|-------|--------------------------|-------|-----------------|---------------------|-------|----------|
|   | n                     | %     | n                        | %     |                 | Lower               | Upper |          |
| Seek regular guidance/ consultation with you psychologist or counsellor |                       |       |                          |       |                 |                     |       |          |
| Yes   | 13                    | 21.0% | 49                       | 79.0% | Reference       |                     |       |          |
| Sometimes   | 18                    | 30.5% | 41                       | 69.5% | 1.69            | 0.87                | 3.27  | 0.121    |
| No  | 86                    | 30.9% | 192                      | 69.1% | 1.65            | 0.73                | 3.78  | 0.232    |
| Visit a health consultant   |                       |       |                          |       |                 |                     |       |          |
| Yes   | 24                    | 28.2% | 61                       | 71.8% | Reference       |                     |       |          |
| Sometimes   | 30                    | 31.6% | 65                       | 68.4% | 1.00            | 0.58                | 1.75  | 0.990    |
| No  | 62                    | 28.3% | 157                      | 71.7% | 1.17            | 0.62                | 2.23  | 0.625    |
| Undertake cancer screening tests, e.g. Prostate, cervical etc.          |                       |       |                          |       |                 |                     |       |          |
| Yes   | 29                    | 22.8% | 98                       | 77.2% | Reference       |                     |       |          |
| Sometimes   | 36                    | 31.6% | 78                       | 68.4% | 1.64            | 0.97                | 2.79  | 0.067    |
| No  | 52                    | 32.7% | 107                      | 67.3% | 1.56            | 0.88                | 2.76  | 0.128    |
| Undertake annual vaccinations as prescribed                             |                       |       |                          |       |                 |                     |       |          |
| Yes   | 40                    | 29.4% | 96                       | 70.6% | Reference       |                     |       |          |
| Sometimes   | 16                    | 23.9% | 51                       | 76.1% | 1.08            | 0.67                | 1.73  | 0.762    |
| No  | 61                    | 31.0% | 136                      | 69.0% | 0.75            | 0.38                | 1.47  | 0.408    |
| Undertake a heart function test   |                       |       |                          |       |                 |                     |       |          |
| Yes   | 17                    | 18.7% | 74                       | 81.3% | Reference       |                     |       |          |
| Sometimes   | 20                    | 41.7% | 28                       | 58.3% | 1.95            | 1.08                | 3.51  | 0.027    |
| No  | 80                    | 30.9% | 179                      | 69.1% | 3.11            | 1.43                | 6.78  | 0.004    |
| Enrol into a disease management plan                                    |                       |       |                          |       |                 |                     |       |          |
| Yes   | 11                    | 24.4% | 34                       | 75.6% | Reference       |                     |       |          |

|   |    |       |     |       |           |      |      |       |
|---|----|-------|-----|-------|-----------|------|------|-------|
| Sometimes   | 12 | 30.8% | 27  | 69.2% | 1.31      | 0.64 | 2.70 | 0.457 |
| No  | 94 | 29.8% | 221 | 70.2% | 1.37      | 0.53 | 3.59 | 0.517 |
| Read more articles on health issues   |    |       |     |       |           |      |      |       |
| Yes   | 54 | 28.7% | 134 | 71.3% | Reference |      |      |       |
| Sometimes   | 29 | 28.2% | 74  | 71.8% | 1.14      | 0.68 | 1.91 | 0.617 |
| No  | 34 | 31.5% | 74  | 68.5% | 0.97      | 0.57 | 1.66 | 0.918 |
| Attend health sessions on topical issues of concern, e.g., how to live healthy, maintaining a healthy heart |    |       |     |       |           |      |      |       |
| Yes   | 41 | 29.1% | 100 | 70.9% | Reference |      |      |       |
| Sometimes   | 31 | 34.4% | 59  | 65.6% | 0.89      | 0.54 | 1.46 | 0.631 |
| No  | 45 | 26.6% | 124 | 73.4% | 1.28      | 0.73 | 2.26 | 0.391 |
| Network with focused groups on well-being e.g. Building Healthy Families                                    |    |       |     |       |           |      |      |       |
| Yes   | 34 | 25.6% | 99  | 74.4% | Reference |      |      |       |
| Sometimes   | 29 | 43.9% | 37  | 56.1% | 2.28      | 1.22 | 4.25 | 0.009 |
| No  | 54 | 26.9% | 147 | 73.1% | 1.07      | 0.65 | 1.76 | 0.792 |
| Health Tips (healthy dietary patterns, effective workout/ exercise patterns, personal hygiene etc.)         |    |       |     |       |           |      |      |       |
| Yes   | 91 | 29.2% | 221 | 70.8% | Reference |      |      |       |
| No  | 26 | 29.5% | 62  | 70.5% | 1.02      | 0.61 | 1.71 | 0.945 |
| Engage in safe sexual practices   |    |       |     |       |           |      |      |       |
| Yes   | 98 | 29.9% | 230 | 70.1% | Reference |      |      |       |
| Sometimes   | 11 | 35.5% | 20  | 64.5% | 0.59      | 0.26 | 1.32 | 0.197 |
| No  | 8  | 20.0% | 32  | 80.0% | 1.29      | 0.60 | 2.80 | 0.517 |
| Undertake a HIV test  |    |       |     |       |           |      |      |       |
| Yes   | 80 | 29.5% | 191 | 70.5% | Reference |      |      |       |
| Sometimes   | 20 | 35.7% | 36  | 64.3% | 1.83      | 0.85 | 3.95 | 0.124 |
| No  | 17 | 23.3% | 56  | 76.7% | 1.38      | 0.76 | 2.52 | 0.295 |

\* Significant at p<0.05 bolded; <sup>ψ</sup> Odds ratio; <sup>φ</sup> 95% Confidence Interval

#### 4.16 Association of life challenges with hypertension among respondents

Table 4.16. Shows an analysis of the relationship between life challenges/issues and hypertension. Respondents with parenting issues had significantly 37.3% increased proportion of hypertension [OR=2.05; 95% CI: 1.31-3.22; P=0.002] compared to 24.0% who indicated otherwise.

**Table 4.16: Association of life challenges with hypertension among respondents**

| Variables   | Hypertensive,<br>(N=117) |       | No hypertension,<br>(N=283) |       | OR <sup>ψ</sup> | 95% CI <sup>φ</sup> |       | p value*     |
|---|--------------------------|-------|-----------------------------|-------|-----------------|---------------------|-------|--------------|
|   | n                        | %     | n                           | %     |                 | Lower               | Upper |              |
| Marital and relationship issues   |                          |       |                             |       |                 |                     |       |              |
| <b>Yes</b>  | 54                       | 33.1% | 109                         | 66.9% | 1.41            | 0.9                 | 2.21  | <b>0.13</b>  |
| <b>No</b>   | 63                       | 26.7% | 173                         | 73.3% | Reference       |                     |       |              |
| Parenting issues  |                          |       |                             |       |                 |                     |       |              |
| <b>Yes</b>  | 57                       | 37.3% | 96                          | 62.7% | 2.05            | 1.31                | 3.22  | 0.002        |
| <b>No</b>   | 60                       | 24.4% | 186                         | 75.6% | Reference       |                     |       |              |
| Family Issues   |                          |       |                             |       |                 |                     |       |              |
| <b>Yes</b>  | 18                       | 23.4% | 59                          | 76.6% | 0.69            | 0.39                | 1.23  | <b>0.205</b> |
| <b>No</b>   | 98                       | 30.7% | 221                         | 69.3% | Reference       |                     |       |              |
| Finances  |                          |       |                             |       |                 |                     |       |              |
| <b>Yes</b>  | 41                       | 25.6% | 119                         | 74.4% | 1.37            | 0.88                | 2.14  | <b>0.168</b> |
| <b>No</b>   | 76                       | 32.1% | 161                         | 67.9% | Reference       |                     |       |              |
| Work Related Issues   |                          |       |                             |       |                 |                     |       |              |
| <b>Yes</b>  | 32                       | 26.7% | 88                          | 73.3% | 0.83            | 0.51                | 1.33  | <b>0.432</b> |
| <b>No</b>   | 85                       | 30.6% | 193                         | 69.4% | Reference       |                     |       |              |
| Work life balance   |                          |       |                             |       |                 |                     |       |              |
| <b>Yes</b>  | 87                       | 28.4% | 219                         | 71.6% | 0.75            | 0.44                | 1.25  | <b>0.265</b> |
| <b>No</b>   | 30                       | 31.9% | 64                          | 68.1% | Reference       |                     |       |              |
| Financial literacy  |                          |       |                             |       |                 |                     |       |              |
| <b>Yes</b>  | 91                       | 31.5% | 198                         | 68.5% | 1.53            | 0.9                 | 2.61  | <b>0.116</b> |
| <b>No</b>   | 26                       | 23.4% | 85                          | 76.6% | Reference       |                     |       |              |
| Lifestyle Related Issues  |                          |       |                             |       |                 |                     |       |              |
| <b>Yes</b>  | 7                        | 23.3% | 23                          | 76.7% | 0.71            | 0.30                | 1.71  | <b>0.445</b> |
| <b>No</b>   | 110                      | 30.0% | 257                         | 70.0% | Reference       |                     |       |              |
| Personal wellbeing  |                          |       |                             |       |                 |                     |       |              |
| <b>Yes</b>  | 65                       | 27.8% | 169                         | 72.2% | 0.9             | 0.57                | 1.4   | <b>0.629</b> |
| <b>No</b>   | 52                       | 31.3% | 114                         | 68.7% | Reference       |                     |       |              |
| Have you ever felt that your health has been adversely affected by your work? |                          |       |                             |       |                 |                     |       |              |
| <b>Yes</b>  | 44                       | 33.8% | 86                          | 66.2% | 1.34            | 0.84                | 2.13  | <b>0.219</b> |
| <b>No</b>   | 73                       | 27.2% | 195                         | 72.8% | Reference       |                     |       |              |
| Average sleeping hours per day  |                          |       |                             |       |                 |                     |       |              |
| <b>More than 8 hours</b>  | 9                        | 29.0% | 22                          | 71.0% | 1.23            | 0.49                | 3.06  | <b>0.660</b> |
| <b>6-7 hours a day</b>  | 86                       | 30.6% | 195                         | 69.4% | 1.32            | 0.77                | 2.28  | <b>0.314</b> |
| <b>5 hours and below</b>  | 22                       | 25.0% | 66                          | 75.0% | Reference       |                     |       |              |

\* Significant at p<0.05 bolded; <sup>ψ</sup> Odds ratio; <sup>φ</sup> 95% Confidence Interval

#### **4.17 Multiple regression analysis of factors associated with hypertension**

Multiple regression analysis was performed to identify factors independently associated with hypertension among the respondents. Nine (9) factors that were associated with hypertension at  $P < 0.05$  during bivariate analysis were subjected all together in a multiple regression analysis (Table 4.16; Full model). Upon fitting these factors using binary logistic regression and by specifying '*backward LR*' method with removal at  $P < 0.05$ , four (4) factors remained in the final analysis or reduced model (Table 4.17). Respondents who were classified as overweight had 12.52 times more likely to develop hypertension compared to those respondents with normal weight [AOR=12.52; 95%CI=4.66 – 33.64;  $P < 0.001$ ]. Likewise, obese respondents were 45.32 times more likely to develop hypertension compared to those respondents within normal range of weight [OR=45.32; 95%CI=15.73 - 130.16;  $P < 0.001$ ]. Respondents not trying to reduce fat in their diet were 4.17 times more likely to have hypertension [AOR=4.17; 95%CI=1.83 – 9.21;  $P = 0.001$ ] than to those always tried to reduce fat in their diet.

Respondents who sometimes engage on more physical exercises were 2.32 times more likely to develop hypertension [AOR=2.32; 95%CI=1.24 - 4.35;  $P = 0.009$ ] compared to those who always engaged in more physical exercises. Respondents with parenting issues were about 1.80 times more like to have hypertension [AOR=1.80; 95% CI: 1.04-3.12;  $P = 0.037$ ] compared to those who did not have parenting issues.

**Table 4.17: Multivariable analysis of factors associated with hypertension**

| Variables  | AOR       | 95% CI |        | p value*     |
|--|-----------|--------|--------|--------------|
|  |           | Lower  | Upper  |              |
| Reduced model  |           |        |        |              |
| Body mass index classification                         |           |        |        |              |
| <b>Normal weight (18.5 - 24.9)</b>                     | Reference |        |        |              |
| <b>Overweight (25 - 29.9)</b>                          | 12.52     | 4.66   | 33.64  | <0.001       |
| <b>Obese (=&gt;30)</b>                                 | 45.32     | 15.73  | 130.61 | <0.001       |
| I often try to reduce fat in my diet                   |           |        |        |              |
| <b>No</b>  | 4.17      | 1.83   | 9.21   | 0.001        |
| <b>Sometimes</b>                                       | 1.99      | 0.99   | 4.02   | <b>0.055</b> |
| <b>Yes</b>   | Reference |        |        |              |
| Start or engage in more physical exercises/ activities |           |        |        |              |
| <b>No</b>  | 1.35      | 0.60   | 3.02   | <b>0.469</b> |
| <b>Sometimes</b>                                       | 2.32      | 1.24   | 4.35   | 0.009        |
| <b>Yes</b>   | Reference |        |        |              |
| Parenting issues                                       |           |        |        |              |
| <b>Yes</b>   | 1.80      | 1.04   | 3.12   | <b>0.037</b> |
| <b>No</b>  | Reference |        |        |              |

**AOR = Adjusted Odds Ratio; CI = Confidence interval; \*Significant p value bolded**

## CHAPTER FIVE

### DISCUSSION AND RECOMMENDATIONS

#### 5.1 Summary of study findings

A total of 400 respondents participated in the study. Male 34.9%, female 65.1%. Nine (9) factors that were associated with hypertension at  $P < 0.05$ . Adults within the ages 40-49 years old were most at risk of developing hypertension as compared to others. Overweight and obesity 60.2% was attributed to the onset of hypertension compared to 4.0% respondents with normal weight. Unhealthy diet 37.3% had a significant increase in proportion of hypertension among respondents who did not eat at least five servings of fruits and vegetables compared to 25.4% of respondents who indicated otherwise. Similarly, 50.8% of respondents were at risk of hypertension for not trying to reduce fat in their diet compared to 27.6% of respondents who were trying to reduce fat in their diet. Respondents who engaged sometimes in physical exercise had 41.8% significant proportion of hypertension compared to 24.6% of respondents who were always engaged in more physical exercises. Socio-factors that significantly increased the risk of hypertension such as high or excessive consumption of alcohol; 36.3% of respondents with a family history of hypertension had an increased proportion of hypertension compared to 25.8% of respondents without family history of high blood pressure. Respondents who had occasional network with focused groups on well-being as sometimes had significantly more proportion of hypertension 47.4% than the respondents who always had a network of focused group 27.0%. Respondents with parenting issues had increased proportion of hypertension 39.3% as compared to those without parenting issues 24.0%.

#### 5.2 Prevalence of hypertension among employees at the call centre

The study findings show that hypertension was prevalent at 29.3% among the respondents. The prevalence rate are several predispositions: The findings indicated that adults within the ages 40-49 years old were more at risk of developing hypertension as compared to others. Overweight and obesity 60.2% was attributed to the onset of hypertension compared to those of normal weight. According to Bonita,

Winkleman and Douglas (2003), WHO steps survey conducted between 2003 -2009 in 20 African countries reported a prevalence rate of between 19.3% and 39.6% between countries. Hypertension was more prevalent in urban population than in the rural population. The employees at the call centre reside in an urban setup which is consistent with the findings of this study. WHO steps survey further reported that hypertension cases were more pronounced among adult population of 18 years and above. WHO (2013) defines obesity as the accumulation of excess body fat in the body which increases the risk of hypertension and associated with coronary artery disease and some cancers (Ruseski, 2014). WHO Steps survey (David et al., 2015) shows that overweight and obesity is highly prevalent in African countries.

This study finding affirms the description of a call centre as a high-pressure and stressful work environment (Mwendwa & Gitonga, 2017). The associated burden of work and the erratic work timings at the call centre can lead to personal ill-health such as hypertension among other related disorders. The prevalence of hypertension at the call centre is in tandem with the prevalence rate for Sub Saharan Africa at the range of 25% to 35% in adults aged 25 to 64 years (Kearney, 2004) and increases with advancing age. About call centres, this study finding is supported by Suri and Rizvi (2008) which found 32% prevalence of hypertension in a call centre in Bangalore

The study finding revealed 51.7% employees are at pre-hypertensive stage. The upsurge of hypertension is a time bomb in waiting. It is recognized that persons with pre-hypertension are at a much higher risk of progressing to hypertension and becoming prone to hypertension associated CVDs. The study found that advancement in age is a contributing factor to onset of hypertension. Therefore, demographic shift is expected to contribute to the high prevalence of high blood pressure among employees in the years to come (Steven, 2013)

### **5.3 Factors associated with hypertension at the call centre**

WHO (2013) classified causes of hypertension into four major categories: behavioral risk factors, metabolic factors, Social determinants and cardiovascular diseases. According to this study, several factors associated with hypertension were realized.

Unhealthy diet had a significant increase in proportion of hypertension among 37.3% respondents who did not eat at least five servings of fruits and vegetables compared to 25.4% who indicated otherwise. Similarly, increased proportion of hypertension was noted among 50.8% respondents who were not trying to reduce fat in their diet as compared to 27.6% who were trying to reduce fat in their diet. Fruits and vegetable are considered a healthy dietary habit whose benefits are associated with reduced risk of hypertension and other related CVDs. Unfortunately, fruits and vegetable consumption are affected by economic, cultural and the potential agricultural productivity (David et al., 2015). The WHO stepwise approach (Bonita et. al., 2003) advocates for sufficient fruits and vegetables intake and defined it as five or more servings per one typical day

The association between physical exercise and hypertension revealed that respondents who engaged sometimes in physical exercise had 41.8% of hypertension compared to 24.6% who always engaged in physical exercise. Physically inactive people are more likely to be obese, which is a risk factor for NCDs including high blood pressure (Ruseski, 2014). Evidence shows that physical activity has been positive on reducing hypertension (Bonita, Winkleman & Doughlas, 2003). WHO steps findings prescribes physical activity as being moderately or vigorously engaged for more than 150 minutes per week. Adequate physical activity has been shown to have many health promoting effects and has a direct, independent role in reducing hypertension (Ruseski, 2014).

WHO (2013) reports that approximately 2.3 million deaths occur each year from harmful use of alcohol. Smoking is estimated to cause about 71% of lung cancer while tobacco use increases the risk of complications of hypertension. From this study, there was no significant association between substance use and hypertension. This could be attributable to the small sample size; it was difficult to disentangle this variable. However, studies (WHO, 2010) indicate that tobacco smoking is associated with the risk of developing hypertension (Bonita, Winkleman, & Doughlas, 2003). Further, tobacco smoking predisposes to cardiovascular diseases such as stroke, thrombosis, and heart attack. WHO steps survey identified other socio-factors that

significantly increase the risk of hypertension such as high level (excessive) consumption of alcohol (Bonita, Winklemann, & Doughlas, 2003)

Respondents with a family history of hypertension 36.3% had a significantly increased proportion of hypertension compared to 25.8% without family history of high blood pressure. World Heart federation ([www.world-heart-federation.com](http://www.world-heart-federation.com)) contends that the presence of a cardiovascular disease in a family increases an individual's risk of developing hypertension.

Further, respondents who reported networking with focused groups on well-being had significantly more proportion of hypertension at 47.4% than 27.0% who always had social networks with focused groups. Social network and support provide and keep communication channels open, social networks may also shape disease diagnosis and management. Stronger network ties –as measured by frequency of interaction and emotional closeness- buffer physiological responses to stress and reduce feelings of loneliness which give rise to physiological dysregulation such as inflammation and elevated blood pressure (Erin & Linda, 2012)

On life challenges, an analysis of relationships between life challenges and hypertension revealed that 39.3% respondents with parenting issues had slightly increased proportion of hypertension as compared to 24.0% who indicated otherwise. A correlational study on mental (Jacquelyn et al., 2007) indicated a significant relationship among parental stress and health as attributable to childcare characteristics and social support. This study intimates that hypertension is a likelihood and can result due to parental stress associated with child care and support. This study affirms that the associated factors increase the likelihood of hypertension.

#### **5.4 Health seeking behaviours among respondents**

Table 4.7 displays the health seeking behaviour by respondents at the call centre. There were 21.3% respondents visiting health consultants periodically for regular check-ups. Majority of the respondents 69.7% did not seek regular consultation with their psychologist or counsellor. 39.8% of respondents never undertook cancer

screening tests while 65.1% of respondents did not undertake heart function test. 78.9% of respondents were not enrolled into a disease management plan. About 47.1% were reading more articles on health issues while 78.0% preferred reading health tips including healthy dietary patterns, effective workout or exercise patterns and personal hygiene. Table 4.7.1 shows that 82.2% respondents engaged in safe sexual practices with 67.7% undertaking HIV test

Preventive health came into existence in 1960's. This signaled the onset of healthcare reforms (Loeppke, 2008). Managed care organizations that flourished during that time introduced the concept of insurance coverage for services emphasizing on early screening, diagnosis, prevention and health promotion. Primary care providers were encouraged and often rewarded for attending to appropriate screening and preventive care. Consequently, healthy people program was initiated with attention to public health issues and established a ten-year target to improve population health management (Loeppke, 2008)

Traditionally, the effectiveness of wellness and prevention initiatives had been gauged by assessing utilization of these services by employees. Proactive health promotion program was viewed as both logical and necessary alternatives to traditional healthcare approaches. Currently employers have made health promotion services accessible through the comprehensive medical insurance plan. These services include occupational screening, health risk assessments, routine vaccinations, early diagnosis and enrolment of employees into a disease management program besides other curative services. Despite this development, curative services take precedence over preventive health programs. This calls for an aggressive and robust health promotion campaign through information, education and communication materials to employees.

## **5.5 Conclusion**

- a) The prevalence of hypertension at the call centre stands at (29.3%) rounded off to 30%. More than half 52% of employees were pre-hypertensive-this is a time bomb in waiting. This prevalence rate was associated with advanced age, overweight and obesity among the respondents.

- b) The factors associated with hypertension in this study are: Unhealthy diet, limited intake of fruits and vegetables, excess fat in the diet, limited physical activity, high or excessive consumption of alcohol, family history of hypertension, lack of social networking and parenting responsibility.
- c) There are notable variations in health seeking behaviour among respondents at the call centre. Key concerns arise due to lack individual empowerment to seek health services

### **5.6 Recommendations from the study findings**

- a) Emphasis on integrated health management program incorporating preventive health and advocacy programs towards modifiable behavioral risk factors such as diet, exercise, and obesity alongside staff empowerment aimed at maintaining target weight and overweight and obesity to alleviate the high prevalence of hypertension at the call centre.
- b) To mitigate factors associated with hypertension at the call centre, there is need to establish destressing facilities like gymnasium, games room, yoga, meditation room, prayer room, reading library, and a counselling facility at the call centre to help employees unwind.
- c) Designing a comprehensive health promotion program at the call centre alongside robust advocacy program on health promotion to include early detection and treatment of hypertension, psychological support and emphasis on the importance of having a stress-free and healthy lifestyle through regular IEC (Information, Education and Communication) materials.
- d) Policy formulation and emphasis on smoke free environment alongside limited consumption or avoidance of alcohol intake being key factors attributed to hypertension at the call centre

### **5.7 Limitation of the study.**

- a) From the study, it is challenging to make casual effect.
- b) This was a cross sectional (snapshot) study of the situation, this might have delivered differing results if another timeframe had been chosen

c) In clinical practice, a diagnosis of hypertension requires multiple measurements on several occasions. In this study a single occasion measurement was taken and therefore could be an overestimation

## REFERENCES

- Ayah, R, Joshi, M.D, Wanjiru, R, Njau, E.N., Otieno, CF, Njeru, E.K., Mutai, K.A (2014). population-based survey of prevalence of hypertension and associated cardiovascular risk factors in an urban slum in Nairobi, Kenya *BMC Public Health.*, 14, 1177.
- Baicker, K., Cutler, D., & Song, Z. (2010). Workplace wellness programs can generate savings. *Health affairs*, 29(2), 304-311.
- Bhuyar, P, Banerjee, A, Pandve, H, Patil, A, Rajan, S, & Chaudhury, S. (2008). Mental, physical and social health problems of call centre workers. *Ind Psychiatry J.* 17, 21–5.
- Bonita, R., Winkleman, R. & Douglas, K. (2003). The WHO Stepwise Approach Surveillance (STEPS) of Non-Communicable Risk Factors. *In Global Behavioural Risk Factors, 2003*, 9-22.
- Bovet, P., Shamlaye, C., Gabriel, A., Riesen, W., & Paccaud, F., (2006). Prevalence of cardiovascular risk factors in a middle-income country and estimated cost of a treatment strategy. *BMC Public Health*, 6, 9.
- Cao, Z. J., Chen, Y. & Wang, S. M. (2014). Health belief model-based evaluation of school health education programme for injury prevention among high school students in the community context. *BMC Public Health*, 14-26.
- Carretero, O & Oparil, S., (2000). Essential hypertension. Part I: definition and etiology. *Circulation*, 101(3), 329–335
- CDC. Centre of Disease Control: (2009). <http://www.cdc.gov>
- Chavan, S.R., & Potdar, B.A. (2011). critical study on work-life balance of BPO employees in India, Retrieved from: [www.trikal.org/ictbm11 /pdf/ OB/ D1241-done.pdf](http://www.trikal.org/ictbm11/pdf/OB/D1241-done.pdf).

- Dalal, S., Beunza, J., Volmink, J., Adebamowo, C., Bajunirwe, F., Njelekela, M., Holmes, D., 2011, Non-communicable diseases in sub-Saharan Africa: what we know now. *Int J Epidemiol*, 40(4), 885-901.
- David, G., Joan, N., Carien, L. Clement, A., Ike, O., & Francis, B. (2015). The Burden of Hypertension in Sub-Saharan Africa. *A four- country cross sectional study*, 15(8), 11.
- DeVol, R., Bedroussian, A., Charuworn, A., Chatterjee, A., Kim, I.K., & Chatterjee, A., (2007). *An Unhealthy America: The Economic Burden of Chronic Disease*. Santa Monica, CA: Milken Institute.
- Erin, Y., & Linda, J. (2012). Social Network Resources and Management of Hypertension. *J Health Soc. Behav*, 53(2), 215-231.
- Hochbaum, G., Rosenstock, I., & Kegels, S. (1952). Health belief model. *United States Public Health Service*.
- Jacquelyn, Y., Olivia, G., Nancy, T., & Peter, L. (2007). Parental Stress Among African American Parents and Grand Parents. *Issues Ment Health Nurs.*, 28(4), 373-387.
- Janz, N. K. & Becker, M. H. (1984). The Health Belief Model: a decade later. *Health Educ Q*, 11(1), 1-47.
- Jung, S. (2014). Stratified Fisher's Exact Test and its Sample Size Calculation. *Biometrical journal. Biometrische Zeitschrift*, 56. 129-40. 10.1002/bimj.201300048.
- Katsivo, M.N., (1991). Apeage: Hypertension in Kitui District: a comparative study between urban and rural populations. *East Africa Med J*, 68, 531-537.
- Kearney, P., Whelton, M., Reynolds, K., Whelton, P., & He, J., 2004, worldwide prevalence of hypertension: a systematic review. *J Hypertens* 22(1), 11-19.

- Kenya National Bureau of Statistics (KNBS) (2009). *Kenya Population and Housing Census*. Nairobi: Kenya National Bureau of Statistics.
- Kigen, W. K. (2014). *The effect of firm size on profitability of insurance companies in Kenya* Unpublished PhD dissertation, Nairobi: University of Nairobi.
- Kunikullaya, K.U., Kirthi, S.K., & Venkatesh, D. (2010). Heart rate variability changes in business process outsourcing employees working in shifts. *Indian Pacing Electrophysiol J.* 10, 439–46.
- Latha, G, & Panchanatham, N. (2010). Call center employees: Is work life stress a challenge? *Sabaramuwa Univ J.* 9, 1–9.
- Lim SS, Vos T, Flaxman AD, (2012). A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: a systematic analysis for global burden of disease study 2010. *Lancet*, 380(9959), 2224–60.
- Lin, Y.H, Chen, C.Y, Hong, W.H., & Lin, Y.C. (2010). Perceived job stress and health complaints at a bank call center: Comparison between inbound and outbound services. *Ind Health.* 48, 349–56.
- Loeppke, R. (2008). The Value of Health and the Power of Prevention. *Int J Workplace Health Manage*, 1, 95-108.
- Loeppke, R., Edington, D. W., & Bég, S. (2010). Impact of the prevention plan on employee health risk reduction. *Population health management*, 13(5), 275-284.
- Mathenge, W, Foster, A, & Kuper, H. (2010). Urbanization, ethnicity and cardiovascular risk in a population in transition in Nakuru, Kenya: a population-based survey. *BMC Public Health*, 10, 569-581. 10.1186/1471-2458-10-569.

- Mishra, G.A, Majmudar, P.V., Gupta, S.D., Rane P.S., Hardikar, N.M, Shastri, S.S. (2010). Call centre employees and tobacco dependence: Making a difference. *Indian J Cancer*, 47(Suppl 1),43–52.
- Morrongiello, B.A., Zdzieborski, D., Sandomierski, M. & Munroe, K. (2013). Results of a randomized controlled trial assessing the efficacy of the Supervising for Home Safety program: Impact on mothers' supervision practices. *Accident Analysis and Prevention*, 50, 587-595.
- Mwendwa, L. & Gitonga, A.K. (2017). Factors influencing call center agent attrition: A case of Kenya Power call center. *International Academic Journal of Information Sciences and Project Management*, 2(1), 415-434.
- O'Brien, E., Beevers, D., Gregory Y. H., (2007). *ABC of hypertension*. London: BMJ Books.
- RAND Report, (2013). *Healthcare in 2013 series. Solving the healthcare cost Challenge*. [www.rand.org/about.html](http://www.rand.org/about.html)
- Ruseski, B. R. (2014). Physical activity and health outcomes: Evidence from Canada. *Health Economics*, 33-54. savings. *Health Affairs (Milwood)*, 29, 1-8.
- Steven, v. & Vijver, H.A. (2013). Status report on Hypertension in Africa- Consultative review for the 6th session of the African Union Conference of Ministers of Health on NCDs. *Pan African Medical Journal*, 2013, 2-8.
- Sudhashree, V.P., Rohit, K, & Shrinivas, K. (2005). Issues and concerns of health among call centre employees. *Int J Occup Environ Med*, 9,129–32.
- Suri, J.C., Sen, M.K., Singh, P., Kumar, R., & Aggarwal, P. (2007). Sleep patterns and their impact on lifestyle, anxiety and depression in BPO workers. *Indian J Sleep Med*. 2, 64–70.

- Suri, S., & Rizvi, S. (2008). Mental health and stress among call center employees. *J Indian Acad Appl Psychol*, 34, 215–20.
- Taylor, P, & Bain, P. (1999). An assembly line in the head: Work and employee relations in the call centre. *Ind Relat J*, 30, 101–17.
- The World Health Report (2002). *Reducing Risks, Promoting Healthy Life*. Geneva: WHO.
- Van de Vijver, S.J., Oti, S.O., Agyemang, C., Gomez, G.B., & Kyobutungi, C. (2003). Prevalence, awareness, treatment and control of hypertension among slum dwellers in Nairobi, Kenya. *J Hypertens*, 31, 1018-1024.
- Walker, R.W., McLarty, D.G., Kitange, H.M., Whiting, D, Masuki, G, Mtasiwa, DM... & Alberti, K.G.M.M. (2000). Stroke mortality in urban and rural Tanzania. *Lancet*, 355, 1684-1687.
- Whelton, P.K., Brancati, F.C, Appel, L.J, Klag, M.J. (1995). The challenge of hypertension and atherosclerotic cardiovascular disease in economically developing countries. *High Blood Press*, 4, 36-45.
- WHO (2005). *WHO Regional Office for Africa Cardiovascular Diseases in the African region*. Geneva: WHO.
- WHO. (2008). *Health Financing Mechanism in Private Health Insurance*. Geneva: WHO
- WHO. (2010). *Global Status Report on Non-Communicable Diseases*. Geneva. WHO
- Williams, L. (2012). *The Prevalence of Essential Hypertension in Kasigau, Kenya (2012)*. Honors College C 7, National Heart Lung and Blood Institute (2012). Categories for Blood Pressure levels in Adults Nairobi: NHLBI:
- World Health Organization. (2013). A global Brief on Hypertension. Switzerland: Retrieved from:[www.AmericaNext.org](http://www.AmericaNext.org).

[www.world-heart-federation.com](http://www.world-heart-federation.com) accessed in September 2017

Yoon, S.S., Fryar, C.D., & Carroll, M.D. (2017) *Hypertension prevalence and control among adults: United States, 2015-2016- CDC*. USA: National Centre for Health Statistics data brief.

Zapf, D, Isic, A, Bechtoldt, M, & Blau, P. (2003). What is typical for call centre jobs. Job characteristics and service interactions in different call centres? *Eur J Work Organ Psychology*, 12, 311–40.

## **APPENDICES**

### **Appendix 1: Respondent's Consent Form: Consent explanation form for participation in the study**

#### **Introduction**

My name is Joseph Onyango Mwagi, a post graduate student pursuing a Master of Science in Public Health (MPH) degree at the Jomo Kenyatta University of Agriculture and Technology, Institute of Tropical Medicine- KEMRI campus. As one of the requirements of this course, I am required to carry out a study to determine the prevalence and factors associated with hypertension among employees at the call centre.

#### **Objective of the study**

To determine the prevalence and factors associated with hypertension among employees working at the call centre

#### **Procedure**

Your selection to participate in this study is by chance and I wish to request you to kindly allow the interviewer to take some time to ask you some questions. If you agree to participate in the study, the interviewer will ask you some questions and record your answers in the questionnaire. The questions will address factors associated with hypertension. Some of the questions are personal. Secondly you will have a chance to undertake a basic health check-up including blood pressure screening, weight and height assessment. However, you are free not to answer any question that you are not comfortable with

**Risks**

There are no risks to you for participating in the study. You will be requested to answer the questions as they are asked, and you are at no obligation to answer any question that you are not comfortable with.

**Benefits**

Your participation in the study will allow you to undertake a basic health check-up (blood pressure measurement, weight and height measurements) for your health benefits. The overall findings and recommendation will assist in designing and implementing a health promotion program that prevents early onset of hypertension among employees.

**Confidentiality/ Privacy**

Any information rendered through the interview questionnaire or clinical assessments will be treated with utmost confidentiality. Your name will not be recorded anywhere on the questionnaire. None of the information you give will be linked to you and it will only be used for the intended purpose.

**Right to refuse or withdraw**

Your participation in this study is voluntary. You are free to decline to participate in this study or withdraw during the process at any stage. You are free not to answer any questions that you are not comfortable with during the process. Refusing to participate or withdrawing from the study will not be used in any way to deny you your rights to healthcare or any of your other constitutional rights

**Persons to contact**

In case of any complaint(s) related to this study, kindly contact;

1. Joseph Onyango Mwagi- P.O Box 45817- 00100 GPO, Nairobi. Tel. 0723354957
2. The Chairperson, KNH/UON ERC. P.O Box 20723-00202 Nairobi; Tel. 0202726300-9 Ext 44102

**Respondent's agreement**

I have read / been explained to the above information and I understand that this study is voluntary, and I may stop or withdraw at any time. I hereby do agree/ Disagree to participate in this study

\_\_\_\_\_

Signature of Participant

\_\_\_\_\_

Date

\_\_\_\_\_

Signature of Research assistant/Interviewer

\_\_\_\_\_

Date

## Appendix II: Study Questionnaire

### Part A: Clinical assessments

| Description     | Results |
|-----------------|---------|
| Weight (kg)     |         |
| Height(m)       |         |
| Body Mass Index |         |
| Blood Pressure  |         |

### Part B:

#### 1. Socio- demographic factors

- 1.2 Gender Male 1 Female 2
- 1.3 What is your marital status?
1. Single
  2. Married
  3. Separated
  4. Divorced
  5. Widowed
  6. Others (specify)\_\_\_\_\_
- 1.4 How old are you (in years)?
1. 18- 24 years
  2. 25- 29 Years
  3. 30 – 34 years
  4. 35 – 39 years
  5. 40 – 44 years
  6. 45 -49 years
  7. 50 years and above
- 1.5 What is your level of education?
1. Primary School
  2. Secondary school
  3. Diploma graduate
  4. Undergraduate (Bachelors degree)
  5. Post graduate (Masters degree)
  6. Others ( Specify) \_\_\_\_\_

1.6 How many years have you worked in the company?

| Years of service    | Tick |
|---------------------|------|
| Less than 12 months |      |
| 1-3 years           |      |
| 4- 6 years          |      |
| 7 – 9 years         |      |
| 10 – 12 years       |      |
| 13 – 15 years       |      |
| Above 15 years      |      |

## 2.0 General health status

2.1 Thinking about the past two (2) years, do you recall undertaking a health check-up?

- a) (1) Yes (go to 2.2)                      (b) No

2.2 If yes, have you ever been treated by a doctor or health worker on any of the following?

| Disease  | Please TICK appropriately |
|--|---------------------------|
| Blood Pressure   |                           |
| Blood sugar levels   |                           |
| Body fat levels (Cholesterol)                                      |                           |
| Body weight (Obesity)  |                           |
| Difficulty in breathing (Respiratory tract infections e.g. Asthma) |                           |
| Others (specify....)   |                           |

2.3 What could have been the reason(s) for not undertaking the health check-up?

- a) Lack of Time
- b) Lack of personal interest
- c) Lack of provision in the medical benefit
- d) Others (specify....)

2.4 Thinking about your family members, are you aware if any of them have being diagnosed with any of the health ailments? (Please tick **ALL** that apply)

|  | YES | NO | Don't Know |
|--|-----|----|------------|
| Increased blood sugar levels (Diabetes mellitus)                                 |     |    |            |
| Increased Blood pressure (High Blood Pressure)                                   |     |    |            |
| Any form of cancers (e.g. cervical cancer in female or prostate cancer in males) |     |    |            |
| Respiratory difficulty (e.g. Asthma,)  |     |    |            |
| Disorders in urine (Renal failure)   |     |    |            |
| Paralysis of any part of the body  |     |    |            |
| Bleeding (Blood) Disorders e.g. Haemophilia                                      |     |    |            |
| Others (specify....)   |     |    |            |

2.4 Are you currently taking any medication for a long term (chronic) illness?

- (1) Yes (Go to 2.4.1)
- (2) No

2.4.1 (If yes) Please specify the disease you are currently being treated for.....

2.5 Have you ever felt that your health has been adversely affected by your work? 1. Yes 2. No

### 3. Behavioural risk factors

3.1 How often do you include fruits and vegetables in your diet?

- a. With every meal
- b. Daily (once daily)

- c. At least three times a week
- d. Once a week
- e. Others (Specify .....

3.2 What is your daily water intake?

- a. More than 2 litres daily
- b. 1 - 2 litres daily
- c. Less than 1 litre daily
- d. Others (Specify .....

3.3 How often do you engage in a planned physical (exercise) activity?

- a. Daily
- b. Two to three times per week
- c. More than three times per week
- d. None
- e. Others (specify .....

3.4 What type of physical activity do you often engage in?

- a. Walking, Jogging, running
- b. Swimming,
- c. Aerobics / zumba dance
- d. Cycling
- e. Weight lifting
- f. Others (specify....)

3.5 Do you add salt to your food during meals time, sometimes even before you taste it?

- a. Never
- b. Sometimes
- c. Always

3.6 Do you often sit at your desk all day and only leave when necessary?

- a. Never,
- b. Sometimes
- c. Always

3.7 Do you consume any form of alcoholic drink (e.g. beer, wine)?

- 1) Yes (Go to 3.8)
- 2) No

3.8 How often do you have a drink containing alcohol? (1 drink = bottle of beer or glass of wine or 1 tot of liquor)

- a) Daily
- b) Weekly
- c) Every fortnight
- d) Monthly
- e) Others (specify...)

3.9 On a scale of 1 to 5 (1 being least stressful and 5 being highest stressor) tick the numerical boxes alongside the cause of your stressors against **EACH** of the items described on the table below

| <b>Cause of stress</b>   | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
|--------------------------|----------|----------|----------|----------|----------|
| Personal issues          |          |          |          |          |          |
| Family issues            |          |          |          |          |          |
| Finances                 |          |          |          |          |          |
| Work related issues      |          |          |          |          |          |
| Lifestyle related issues |          |          |          |          |          |
| Others (specify...)      |          |          |          |          |          |

3.10 Please indicate (tick) your average sleeping hours per day.

- a. More than 8 hours
- b. 6- 7 hours a day
- c. 4- 5 hours a day
- d. 3 hours and below
- e. Others (specify.....)

3.11 In the last 30 days, have you smoked one or more tobacco cigarettes?

- a. Yes
- b. No

3.12 Which is your largest meal of the day?

- a) Breakfast
- b) Lunch
- c) Dinner/ Supper
- d) Others (specify ...)

**4. Health seeking behaviour;**

4.1 I have always wanted to improve my health and well- being by

engaging in the following activities. (On a scale of 1 to 5, with 1 being least engaged while 5 being highly engaged, indicate your level of individual effort on the below listed statements)

|   | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| a) Eat at least five servings of fruits and vegetables each day         |   |   |   |   |   |
| b) I often try to reduce fat in my diet                                 |   |   |   |   |   |
| c) I often avoid tobacco smoke or Quit smoking                          |   |   |   |   |   |
| d) Start or engage in more physical exercises/ activities               |   |   |   |   |   |
| e) Maintain a healthy body weight                                       |   |   |   |   |   |
| f) I often take walking breaks at the work place/ including stair walks |   |   |   |   |   |

|  |  |  |  |  |  |
|--|--|--|--|--|--|
| g) Seek regular guidance/ consultation with you psychologist or counselor                                      |  |  |  |  |  |
| h) Visit a health consultant   |  |  |  |  |  |
| i) Undertake cancer screening tests, e.g. Prostate, cervical etc.  |  |  |  |  |  |
| j) Undertake annual vaccinations as prescribed   |  |  |  |  |  |
| k) Undertake a heart function test   |  |  |  |  |  |
| l) Enroll into a disease management plan   |  |  |  |  |  |
| m) Engage in safe sexual practices   |  |  |  |  |  |
| n) Undertake a HIV test  |  |  |  |  |  |
| o) Read more articles on health issues   |  |  |  |  |  |
| p) Attend health sessions on topical issues of concern, e.g., how to live healthy, maintaining a healthy heart |  |  |  |  |  |
| q) Network with focused groups on well-being e.g. Building Healthy Families                                    |  |  |  |  |  |
| r) Others (specify.....)   |  |  |  |  |  |

4.2 What information would be important to you to improve your health and well-being?

- a) Health Tips (healthy dietary patterns, effective workout/ exercise patterns, personal hygiene etc.)
- b) Marital and relationship issues
- c) Parenting issues
- d) Work life balance
- e) Personal wellbeing
- f) Financial literacy
- g) Alcohol and Drug use
- h) Others (specify...)

**Appendix III: KNH-UON Ethics and Research Committee approval letter**