

**SOCIO-ECONOMIC AND INDIVIDUAL FACTORS ASSOCIATED WITH  
OVERWEIGHT AND OBESITY AMONG WOMEN OF REPRODUCTIVE  
AGE IN BUSHENYI DISTRICT, WESTERN UGANDA.**

**By**

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**A RESEARCH REPORT SUBMITTED TO THE FACULTY OF CLINICAL MEDICINE  
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## **DECLARATION**

I Sembeguya simon declare that I am the sole author of this work and it has never been submitted for the award of a degree in any university. Any material which is not my original work has been properly referenced

**Sign** .....

**Date:**

## **APPROVAL**

This work has been submitted to university examiners with my approval as a university supervisor.

.....

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## **DEDICATION**

I wish to dedicate this book to my dear parents; Mr.Kyeswa Jeremiah and Mrs. Jane kyeswa for their love, care and incomparable financial and moral support.

This book is also dedicated to Mr. Mbina solomon for his continuous supervision and encouragement.

I also wish to dedicate this work to my brother Bogere Richard, friends; Bina Sunday alex, ivan M.B, Mula.B for their love, continuous encouragement and support which has seen this research successfully done.

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## **LIST OF ACRONYMS AND ABBREVIATION**

BMI	Body Mass Index
CVD	Cardio Vascular Disease
DM	Diabetes Mellitus
FFQ	Food Frequency questionnaire
GPAQ	Global Physical Activity Questionnaire
MPA	Moderate Physical Activity
NCDs	Non Communicable Diseases
NIDDM	Non-Insulin Dependent Diabetes Mellitus
OR	Odds Ratio
PA	Physical Activity
SSA	Sub-Saharan Africa
SCT	Social Cognitive Theory
SES	Socio Economic Status
UBOS	Uganda Bureau of Statistics
UDHS	Uganda Demographic Health Survey
UNICEF	United Nations International Children's Emergency Fund
VPA	Vigorous Physical Activity
WC	Waist Circumference
WHO	World Health Organization

## OPERATIONAL DEFINITIONS

**Moderate Physical Activity:** Activities that require small increases in breathing or heart rate.

**Overweight and Obesity:** an abnormal or excessive fat accumulation that presents a risk to health. The most commonly used measure for overweight and obesity is the Body Mass Index (BMI). For this study, a BMI  $\geq 25\text{kg/m}^2$ , is considered overweight and  $\geq 30\text{kg/m}^2$ , is considered obesity.

**Parity:** The total number of children that someone has given birth to, both those alive and those dead

**Physical Activity:** Any bodily movements engaged in during work, transport and during leisure time, that result in increased energy expenditure.

**Sedentary Time:** The time spent sitting or doing activities that require minimal or no physical movement or engagement.

**Vigorous Physical Activity:** activities that require hard physical effort and cause large increases in breathing or heart rate. These activities include carrying or lifting heavy loads, standing or walking while carrying heavy loads or very hard physical labour

**Woman of reproductive age:** A female between the ages of 18-49 years who is not pregnant.

## ABSTRACT

**Background:** Overweight and obesity is an escalating problem worldwide, yet extensive data especially in Africa is still lacking. The main objective of the study was to determine the prevalence of overweight and obesity and associated factors among women aged 18-49 in Bushenyi District, Uganda.

**Objectives:** The

The objectives of the study were to determine the prevalence, socio-economic and individual factors associated with overweight and obesity among women of reproductive age in Bushenyi town, Bushenyi district.

**Methods:** A cross-sectional analytical study design was used. Data on prevalence was collected through anthropometric measurements using the BMI (Body Mass Index) while those of socio-economic and individual factors were collected with a structured questionnaires. 271 women aged 18-49 years from Bushenyi District were sampled.

**Results:** The prevalence of overweight and obesity among women of the women of reproductive age in Bushenyi town was 47.24% and 19.92% respectively. The rest of the sampled women were normal (32.84%). The results show that house wives were twice more likely to be overweighed and obese (AOR= 2.006). Also, women who are unemployed (AOR=1.233), who earn >700000 shillings (AOR=1.0263) and owned houses (AOR= 1.0452) are more likely to be overweighed and obese. Women in Bushenyi town who live sedentarily (AOR=2.455), those who take more milk (AOR = 2.710), consume alcohol (AOR = 2.134) and do moderate physical exercise are more likely to be overweighed and obese. Women who take ghee (AOR = 1.969) and eat rice (AOR= 1.453) are likely to also be overweighed and obese.

**Conclusion/Recommendation:** The high prevalence of overweight and obesity in Beshenyi town as shown in this calls for behaviour change related towards lifestyle, occupation and diet. Hence public health interventions through awareness programmes about the consequences of overall and abdominal obesity should be propagated by government and health partners.



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## CHAPTER ONE

### INTRODUCTION

#### 1.0: Background of the Study

Persons are defined as overweight if their body weight exceeds a certain level for a given body height. Excessive overweight is referred to as obesity and classified as a disease by the World Health Organization (WHO, 2000). Obesity is a risk factor linked to chronic diseases such as type 2 diabetes mellitus (Abdullah et al. 2010), cardiovascular diseases (Guh DP et al. 2009) and some types of cancer. It is also associated with a higher risk of premature death (Carmienke S. et al. (2013), Flegal KM et al. (2013)). Finally, obesity and the associated comorbidities are a major challenge to the health system and present an important public health problem not only in Africa but also worldwide.

Against this background, the WHO developed the Global Action Plan for the Prevention and Control of Non-communicable Diseases 2013-2020. One of the 9 voluntary global non-communicable diseases targets addresses the prevalence of obesity. The rise in diabetes and obesity prevalence should be halted until 2025 on the 2010 levels (WHO2013). According to World Health Organization, the prevalence of overweight has nearly tripled since 1975. (WHO, 2016). Substantive evidence show that the prevalence of overweight among children and adults has continued to increase. In 1980, the prevalence of overweight among men stood at 28.8 % this increased to 36.9 % in 2013 and among women from 29.8 % in the same year to 38.0 % in 2013 globally (Ng et al., 2014). In 2014, the global prevalence of overweight and obesity among adults was estimated at 39 % (38 % of men and 40 % of women) and 13% (11 % of men and 15 % of women), respectively. In 2016, more than 1.9 billion adults, 18 years and above were overweight. Of these, over 650 million were obese. Overall, about 13% of the world's adult population (11% of men and 15% of women) were obese in the same year (WHO, 2016).

Across the WHO regions, America has the highest prevalence of overweight and obesity standing at 61 % and 27 %, respectively, with the lowest reported in the South-East Asia region (22 % overweight and 5 % obesity) (Peltzer *et al.*, 2014). More than 50 % of women in the European, Eastern Mediterranean and American regions are overweight, with almost 50 %

of the overweight women in the same regions being obese. Specific to the African, Eastern Mediterranean and South-East Asian regions, the prevalence of obesity among women has almost doubled that of men (Ng et al., 2014).

In Africa, an estimated 20-50 % of urban populations are either overweight or obese (Kandala & Stranges, 2014). According to WHO, adult prevalence of obesity in Africa was about 6 % among men and 15 % among women in 2014 (WHO, 2015). In eastern sub-Saharan Africa (SSA), the prevalence of overweight and obesity among men was estimated at 14.9 % and 4.4 % in 2013, respectively. In the same year, the prevalence of overweight and obesity among women was estimated at 23.7 % and 8.8 % respectively (Abrha, Shiferaw, & Ahmed, 2016).

Over the years, the Uganda Demographic Health Surveys (UDHS) reported an increasing trend in the prevalence of overweight and obesity among women of reproductive age from 8 % in 1995 to 18.8 % in 2011 (UBOS, 2011b). Uganda's recent national NCD risk factor survey reported 19.1 % adult prevalence of overweight (11.3 % of men and 27.1 % of women); obesity was 4.6 % (1.8 % of men and 7.5 % of women) (MOH, 2014; Wesonga *et al.*, 2016). Although there is a commonly misplaced assumption that under nutrition is the predominant form of malnutrition in the country, a few studies have begun to shed light to the epidemiology of overweight and obesity in the country. A study in rural south-western Uganda among individuals aged 13 years and above reported that 3.6 % of males and 14.5 % of females were overweight and 0.5 % of males and 3.9 % of females were obese (Murphy et al., 2014). Another study among 35–60 years old adults in rural eastern Uganda reported overweight prevalence of 12.3 % (7.5 % of men and 16.9 % of women) and obesity of 5.3 % (2.2 % of men and 8.2 % of women) (Kirunda, Fadnes, Wamani, den Broeck, & Tylleskär, 2015). A study in a large population cohort aged 13 years and above in south-western rural Uganda reported the prevalence of overweight at 11.8 % (5.2 % of men and 16.9 % of women) (Asiki *et al.*, 2013). According to a study among adults aged 25 years and more in Kasese district in rural Uganda, overweight was 15.6 % (14.7 % of men and 16.7 % of women) and obesity was 6.7 % (4.9 % of men and 9.0 % of women) (Mondo, Otim, Akol, Musoke, & Orem, 2013).

The trend of overweight and obesity is growing with shifts in individual and behavioural factors (Bibiloni, Pons, and Tur, 2013; Mosha and Fungo, 2010). Individual factors such as age, sex,

marital status and parity, educational level, income and occupation have been reported to play important roles in the development of overweight and obesity among women (Mbochi, Kuria, Kimiywe, Ochola and Steyn, 2012). Being a female within the child bearing age has also been associated with weight gain (Kirunda, Fadnes, Wamani, den Broeck and Tylleskär, 2015).

Dietary intake and physical activity patterns of an individual are behavioural variables which influences weight gain when they are not balanced (Mbochi *et al.*, 2012). That is to say, when energy intake exceeds energy expenditure, the body system shifts to annul this imbalance by converting the excess calories into storage fats which when in excess results in obesity and overweight. However with adequate physical activity, our bodies will metabolize excess calories or body fat as heat rather than tucking them into storage.

Overweight and obesity are independent risk factors for diabetes and insulin resistance among different populations; for each increase in BMI, the risk of diabetes increases by 12% (Hu, Bhupathiraju, de Koning, & Hu, 2014). The distribution of fat around the trunk region or central obesity is also a strong risk factor for diabetes (Jamison *et al.*, 2006). *People with severe obesity are at greater risk of type 2 diabetes than obese people with a lower BMI* (Daousi *et al.*, 2006)..

In Uganda, the nutritional transition taking place is not different from other low and middle income countries, and is associated with accelerating growth of chronic, non-communicable diseases (Schwartz, Guwatudde, Nugent and Kiiza, 2014). Baalwa, Byarugaba, Kabagambe, & Otim, (2010) estimated that 25-60% of urban women are overweight. Similarly Uganda demographic health survey from 1995 to 2016 reported an increasing prevalence of overweight and obesity from 8% to 24% (UBOS, 2011b). The WHO (2016) diabetes county profile reported 5170 deaths attributed to high blood glucose as well as 4690 diabetes deaths. From this report, the death toll from high blood glucose and diabetes among women is estimated at 50% and 49% respectively. From the same report, overweight and obesity accounted for 18% and 3.9% respectively. Among females, the cumulative prevalence of the said risk factors was 16.2% against 6.3% in males (WHO, 2016).



## **1.1 Problem Statement**

Worldwide, the prevalence of overweight and obesity are on the rise (Abubakari AR et al, (2008) Berghofer A,et al (2009)) while the prevalence of under-nutrition has not significantly changed over the last decade (Muller O, Jahn A 2009). While underweight prevalence is still high [4], overweight and obesity are now prevalent in low- and middle-income countries, including those in Africa (Prentice AM. 2006), at a prevalence of 20–50 % (Sola AO et al, 2011) in urban areas and 7–30 % in rural areas (Mayega RW et al, 2012).

In SSA, the rising prevalence of overweight and obesity co-exists with the under-nutrition epidemic [Agyemang C et al, 2009, Assah FK, et al 2009 ). Underweight, overweight and obesity are known risk factors for NCDs (Kozak AT et al 2012, Sairenchi T, et al 2008). Similarly, the Uganda Demographic and Health Surveys (UDHS) from 1995 to 2011 reported an increasing prevalence of overweight and obesity from 8 to 18.8 % while underweight prevalence stagnated at 10 – 12 % (UBOS & ICF, 2012). However, evidence examining the influence of the individual, social-economic as well as environment on overweight/obesity is still sketchy and limited to urban and suburban populations in high-income countries which cannot be generalized to low- and middle-income countries and this is even true in rural settings.

In Bushenyi district, there is paucity of research data regarding overweight/obesity and its associated factors among women. This study therefore sought to determine the prevalence of overweight and obesity and associated factors among women of reproductive age in Bushenyi Town, Bushenyi District.

## **1.2 Research Objectives**

### **1.2.1 Broad Objective (Purpose of the Study)**

To assess socio-economic and individual factors associated with overweight and obesity among women of reproductive age in Bushenyi district, Uganda.

### **1.2.2 Specific Objectives**

- i. To determine the prevalence of overweight and obesity among women of reproductive age in Bushenyi District, Uganda.
- ii. To identify the socio-economic factors associated with overweight and obesity among women of reproductive age in Bushenyi District, Uganda.

- iii. To establish the individual factors associated with overweight and obesity among women of reproductive age in Bushenyi District, Uganda of reproductive age in Bushenyi District, Uganda.

### **1.3 Research Questions**

- i. What is the prevalence of overweight and obesity among women of reproductive age in Bushenyi District, Uganda?
- ii. What are the socio-economic factors associated with overweight and obesity among women of reproductive age in Bushenyi District, Uganda?
- iii. What are the individual factors associated with overweight and obesity among women of reproductive age in Bushenyi District, Uganda?

### **1.4 Significance of the Study**

The findings of this study are expected to inform practice and policy decisions in the development of appropriate interventions to promote health and control overweight and obesity among women in Bushenyi district.

Findings from this study are expected to add to the limited existing data on overweight and obesity among women in Bushenyi District, western Uganda.

The study findings serve as a piece for sensitization of women on the magnitude of overweight and obesity in the district.

### **1.5 Scope of the Study**

#### **1.5.1 Content Scope**

The main focus of this study is to assess the socio-economic and individual factors associated with overweight and obesity among women of reproductive age in Bushenyi district, Uganda.

#### **1.5.2 Geographical Scope**

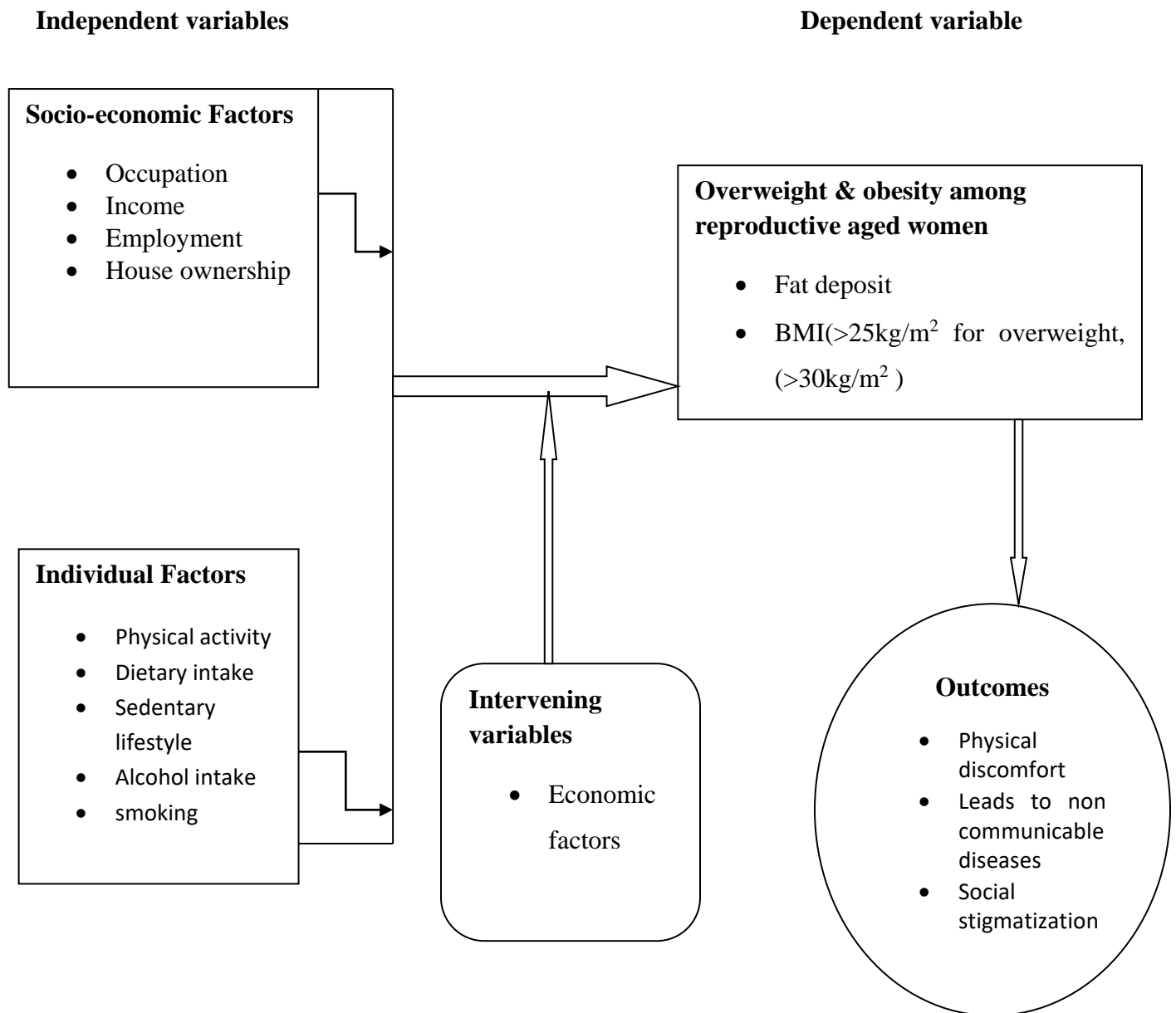
The study was conducted in Bushenyi Town, Bushenyi district. Bushenyi District is in Western Uganda. It is bordered by Rubirizi District to the northwest, Buhweju District to the northeast, Sheema District to the east, Mitooma District to the south and Rukungiri District to the west. The District is made of 1 County (Igara), twelve sub counties of Bushenyi D, Bitooma, Ibaare, Bushenyi E, Bushenyi C, Kyabugimbi, Bushenyi A, Kyeizooba, and Ruhumuro, together

with Central Division, Nyakabirizi Division and Ishaka Division., 1 Municipal Council, 4 Town Boards, 3 Wards, 64 parishes and 565 villages. The district has several health units at various levels of administrative unit from Parishes to the district. Some of these health units are government owned while others are NGO owned and others private.

### **1.5.3 Time Scope**

The study was conducted between February, 2018 to March 2019.

## 1.6 Conceptual Framework



**Figure 1: Conceptual Framework**

**Source:** Self developed conceptual framework

### **Description of Conceptual Framework**

The independent variables (IV) are socio-economic and individual factors while the dependent variable (DV) is Overweight and obesity. The framework shows for a person to be overweight or obese, socio-economic factors like occupation, age etc as well as individual factors like physical activity, dietary intake may be instrumental. The consequence of this is increased fat deposit, and non-communicable diseases like cardiac failure, stroke, diabetes etc.

## CHAPTER TWO

### REVIEW OF LITERATURE

#### 2.0 Introduction

This chapter contains a review of literature related to the study according to the specific objectives.

#### 2.1 Prevalence of Overweight and Obesity

Globally, overweight and obesity have dramatically increased since 1980. By the year 2008, more than 1.4 billion adults were overweight and of these, more than 200 million men and about 300 million women were obese (WHO, 2012). In the U.S, one in two women of childbearing age is either overweight or obese (Vahratian, 2009). In 2014, According to WHO global estimates, about 13% of the world's adult population (11% of men and 15% of women) were obese (WHO, 2016). This increase in overweight and obesity has prompted far reaching calls for consistent checking of changes in overweight and obesity prevalence in all populaces (Ng *et al.*, 2014).

Between 1992 and 2005, the prevalence of overweight and obesity increased by almost a third in sub-Saharan Africa (Charles, Medisch and Universiteit, 2014). Wide disparities in levels of obesity are found in this region with the highest rates in South Africa, where mean BMI values for men and women are 22.9 kg/m<sup>2</sup> and 27.1 kg/m<sup>2</sup>. In parts of sub-Saharan Africa obesity often exists alongside under-nutrition. South Africa has been reported to have the highest prevalence of obesity in black men and women in Africa. Mauritania, Swaziland and Gabon have also reported national prevalence of over 20% (Micklesfield *et al.*, 2013).

Overweight among women is increasingly becoming a health problem in Uganda. As of 2006, the prevalence of overweight was higher (17%) than the prevalence of Chronic Energy Deficiency (12%) (UBOS, 2007). By the year 2011, the prevalence of overweight and obesity among Ugandan women had increased to 19% more than four times the prevalence in men (4%) (UBOS, 2011b). Baalwa, Byarugaba, Kabagambe and Otim, (2010) associated overweight with being female. The proportion of households with overweight mothers is also reported to be increasing in both rural and urban areas (FANTA, 2010).

## **2.2 Socioeconomic Factors Associated with Overweight and Obesity**

Important events in a person's emotional life can cause changes in food intake and body weight (Mbochi, Kuria, Kimiywe, Ochola and Steyn, 2012). Marital status has been shown to be associated with BMI and most cross-sectional studies tend to find that married people are more often overweight and obese than those living alone; however, important variations exist according to gender and ethnicity (Tzotzas *et al.*, 2010). It is still not clear how and under what conditions marital status is associated with obesity although interesting hypotheses linking these two outcomes have been raised (Averett, Sikora and Argys, 2008).

Longitudinally, evidence is more consistent, suggesting that marriage predicts weight gain in both men and women, whereas marital termination (through divorce or widowhood) predicts weight loss (Meltzer, Novak, McNulty, Butler and Karney, 2013). According to Ulijaszek, (2007) entry into marriage is associated with weight gain while exit from marriage results in weight loss, but of a lower magnitude.

Parity may contribute to obesity due to postpartum weight retention (Meza and Gutierrez, 2014). Higher number of births is considered as a risk factor for the development of obesity among women (Li *et al.*, 2016). Women frequently perceive that pregnancy triggers their weight gain and obesity. However, the association between reproductive factors such as parity with weight gain and obesity prevalence in women has been intensely investigated but with controversial results (Koch *et al.*, 2008). Having children is likely to impact on a woman's ability to adopt healthy habits (Mbochi, Kuria, Kimiywe, Ochola and Steyn, 2012). This association, according to Kim, Yount, Ramakrishnan and Martorell, (2007) may not be the same in women in developing countries.

Socio-economic status (SES) is one of the most important social determinants of health and disease. Baker, (2014) defined socio-economic status as a measure of one's combined social and economic status and tends to be positively associated with better health. Socio economic status is generally thought to influence health in three different ways: first, SES influences health through the ability to purchase health promoting resources and treatment, secondly SES influences health through socialization of early health habits and continuing. Lastly it has been posited that rather than SES influencing health, health influences SES (Baker, 2014).

In developed countries, obesity is widely considered a condition that affects people of lower socioeconomic status (SES) more than those of higher SES (Wang and Beydoun, 2007). In developing countries, a larger body size might be associated with wealth; thus, in such communities, people in higher SES might prefer a larger body size (Guendelman, Fernald, Neufeld and Fuentes-Afflick, 2010). However, the debate continues as to whether obesity primarily affects the poor or the rich (Dinsa, Goryakin, Fumagalli and Suhrcke, 2012).

In addition, when the socio-economic conditions of urban families improve, the frequency of obesity increases. The proportion of people with low BMI (<18.5) decreases where socio-economic conditions are better (Shetty *et al.*, 1994, cited in Tungdim and Kapoor, 2008). As people acquire higher incomes, their food preferences also change. While formerly they had eaten grain-based diets high in fiber and low in fat content, they begin to eat more fats, more sweeteners and more refined CHO's (Dinsa *et al.*, 2012).

### **2.3 Individual factors associated with Overweight and Obesity**

Dietary intake has been cited as one of the leading forces in the development of overweight and obesity. Over the years, the diets of populations have been changing towards diets that favour weight gain as traditional diets are gradually replaced with modern diets. According to Obulutsa, (2015), development has improved diets; populations have gone through many developmental stages characterized by shift from very simple traditional diets to much more complex ones.

Globally, dietary choices among populations have replaced fiber rich foods with energy-dense, sweeter and processed versions resulting to a rise in body mass (Mbochi, Kuria, Kimiywe, Ochola and Steyn, 2012). In populations undergoing rapid socio-economic improvement, with better access to foods and shifts in diets, NCDs now appear with greater frequency. The shift towards overweight and obesity and chronic diseases in many developing countries invites the misconception that diets are moving away from problems of constraints towards problems of excesses. Intake of micro-nutrient-rich foods such as fruits, vegetables and high quality animal-source foods often remain low, thus even while excessive weight gain and related chronic diseases emerge as serious health problems in developing countries, micronutrient malnutrition is likely to remain highly prevalent. For example in Uganda where the



prevalence of overweight and obesity is particularly high among women, the prevalence of chronic energy deficiency (CED) among women is also high (FANTA, 2010).

Decreased energy expenditure resulting from inadequate physical exercise is one of the factors adding to the global burden of overweight and obesity (Nawab, Khan, Khan and Ansari, 2014). Adequate physical activity has been shown to play a role in promoting good health and has a direct role in reducing cardiovascular disease related deaths. Sedentary lifestyles on the other hand fuels the development of overweight and obesity alongside other factors.

Decreased levels of physical activity has been associated with the high degree of urbanization that has been occurring across the African continent (Mbochi et al., 2012). Walking, which is a traditional pattern of physical exercise has been replaced by public transport in many urban settings. Also, employment in different urban populations usually requires far less physical labour than rural employment or other activities of daily living, such as chopping wood, carrying water, or tilling the fields. Technological advancement has further worsened the episodes of physical inactivity at home, at work, and in transportation as most activities are automated and motorized.

More time spent on sedentary activities tends to increase the likelihood of overweight and obesity among individuals (Matthews *et al.*, 2012).

Maintaining a physically active life is a challenge among many people especially women. A study in the United States reported lower rates of physical activity among women; they were said to drop out of exercise programmes within six months of enrolment (Segar, Eccles, & Richardson, 2008). Another study by Sodjinou, Agueh, Fayomi and Delisle, (2008), reported women involvement in physical activities demanding little energy expenditure. The same study also reported a lower average score for women involvement in physical activity compared to men.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.0 Introduction**

This chapter comprise of a description of the study design, study population, sampling techniques, the instrument or tools used for data collection, data collection methods and procedures, data process and analysis and the ethical considerations.

#### **3.1 Study Design**

The study design was cross-sectional analytical employing quantitative approach.

#### **3.2 Study Area**

The study was carried out in Bushenyi town the headquarter of Bushenyi district. Bushenyi district is 320km from Kampala the capital city and about 61km from Mbarara the nearest biggest Town along Mbarara-Kasese high way. The district has Rubirizi, Buhweju, Sheema, Mitooma and Rukungiri as bordering districts. As at 2014, the district had a total population of 234,440 comprising 116,410 males and 118,030 females. The number of households were estimated at 51,378 with an average household size of 4.5 persons(UBOS, 2017).

#### **3.3 Study Population**

The study population was all women aged 18-49 years residing in Bushenyi town, Bushenyi District.

##### **3.3.1 Inclusion Criteria**

All women between the ages of 18-49 years residing in Bushenyi town for at least six months and present at the time of data collection and consented.

##### **3.8.2 Exclusion Criteria**

Women less than 18 years and those who were pregnant were excluded from the study.

### 3.4 Sample Size Determination

The sample size was estimated using Fisher's formula (1986)

$$n = \frac{Z^2 pq}{r^2}$$

Where:

n = desired sample size

z = standard deviation at desired degree of accuracy which is 1.96 at 95% degree of accuracy.

p = is the proportion of the overweight women in south-western Uganda which is 0.229 (UBOS, 2011).

q = (1-p) 1-0.229 = 0.771

r = margin of error for sampling = 0.05

$$n = \frac{(1.96)^2 \times 0.229(1 - 0.229)}{0.05^2}$$

n = 271

271 Women aged 18- 49 years were sampled.

### 3.5 Study Variables

#### 3.5.1 Dependent Variable

The dependent variable in the study was overweight and obesity

#### 3.5.2 Independent variables

The independent variables of the study were socio-economic and individual factors.

### 3.6 Sampling Procedure

Simple random and systematic sampling techniques were used to obtain at the required sample size. 34 households/participants were selected by systematic sampling. To avoid bias using this method, a direction from the center of each village was selected at random. From a chosen direction every third household was selected (depending on the size of the village) until the required number of households was obtained. If the boundary of the village was reached and the desired number was not obtained, the selection continued in the opposite direction. A household was defined as a group of people who have being living and eating their meals together for at least six months preceding the study. Data was obtained from face-to-face interview and physical

examination. In the event that a study participant was not found in any selected household, the household was replaced with a participant from a neighboring household.

### **3.7 Data Collection Tools and Methods**

Anthropometric measurements and questionnaires were used for data collection.

#### **3.7.1 Determination of prevalence of Overweight and Obesity among women aged 18-49 years in Bushenyi town.**

An anthropometric measurement was used. It involved taking the Body mass index (BMI).

(a) BMI was computed utilizing weight and height measurement of each participant. The weights of participants were measured using a bathroom weighing scale to the nearest 0.1kg with the participant wearing light clothes and no shoes. Measurement of height was done using a steel measuring tape to the nearest 0.1cm with the participant standing upright. BMI was obtained by dividing the weight measured in kilograms against the square of the height in meters.

**Table 1: Classification of Overweight and Obesity.**

<b>Indicator</b>	<b>Overweight</b>	<b>Obesity</b>
BMI ( $kg/m^2$ )	25-29.9	$\geq 30$
Waist Circumference (cm)	80-88cm	$\geq 88$ cm
Waist to height ratio	0.50	$> 0.50$

Source:(WHO, 2013; Yoo, 2016)

#### **3.7.2 Socio-economic and individual factors associated with Overweight and Obesity among women aged 18-49 years in Bushenyi town**

An interviewer-administered questionnaire was used to obtain information on the Socio-economic and individual factors associated with Overweight and Obesity among women aged 18-49 years in Bushenyi town.

### **3.8 Data Quality Control**

#### **Training of data collection team**

The data collection team comprised of four research assistants who are diploma graduates and were indigene who speaks the local language (Ruyankole) fluently. The study team was recruited based on the experience they had in conducting similar research. Two-day training was conducted by the principal researcher on issues bordering on interpretation of the questionnaire and collection of the weights and heights of the respondents.

#### **Pre-testing of questionnaires**

The principal researcher and the data collection team conducted the pre-testing of the questionnaires over a period of two days in Ishaka the closest and commercial town to Ishaka. A total of 20 households were covered with each research assistant covering five households. Pre-testing is done to impart practical experience to the team in administering questionnaires and using of the various anthropometric tools. Pretesting also gave the researcher an idea of the population characteristics.

### **3.9 Validity of Data Collection Tools**

Validity is the extent to which the research results can be accurately interpreted and generalized to other population. It is the extent to which research instruments measures what they are intended to measure (Oso & Onen, 2009). To measure validity, the instrument was given to two experts to evaluate the relevance of each item in the instrument to the objective of the study and to rate each item on the scale of very relevant (4), quite relevant (3), somewhat relevant (2) and not relevant (1). Validity was determined using Content Validity Index (CVI).  $CVI = \text{item rates } 3 \text{ or } 4 \text{ by both experts} / \text{total number of items in the questionnaire}$ .

Therefore,

$$CVI = n \frac{3}{4} / N$$

### **3.9 Data Processing and Analysis**

Crude data were sorted, cleaned and entered into MS Excel version 2013.

Socio-economic, individual and other baseline characteristics were analyzed based on the type and/or scale of measurement they assume. Numerical variables were analyzed by way of central tendency i.e. mean and median and measures of variation i.e. standard deviation and interquartile ranges respectively. All statistical analysis were carried out using SPSS version 20.

### **3.10 Ethical Consideration**

The study was reviewed by the Institutional Research and Ethics Committee of Kampala International University, after the ethics clearance, permission was sought from the District Health Office before undertaking the research, ethical approval was sought from various sources to ensure that the study adhere to acceptable ethical guidelines.

In addition, Informed consent was obtained from each study participant. Each respondent was informed about the purpose of the study. The right to freedom from harm and discomfort was maintained, as participants were not subjected to any risk of harm or injury. The participants were informed that there were no direct benefits for participating in this study. However, the findings of this study will provide a better understanding of overweight and obesity.

### **3.12 Limitations of the study**

#### **Information bias**

Owing to the sensitivity of health related information and status, some of the respondents were shy and unwilling to give detailed information pertaining to their health.

## CHAPTER FOUR

### RESULTS

#### 4.0 Introduction

This chapter contains the results or findings of the study. The results are presented in tables according to the stated objectives of the study.

#### 4.1: Demographic characteristics of the respondents

**Table 2: Socio-Demographic characteristics of women of reproductive age in Bushenyi town**

Variable	Category	Frequency (n = 271)	Percentage
Age (years)	18-22	20	7.38
	23-27	23	8.49
	28-32	32	11.81
	33-37	31	11.44
	38-42	40	14.76
	43-47	80	29.52
	>47	45	16.60
Marital status	Married	101	37.27
	Single	124	45.76
	Separated	39	14.39
	Divorced	7	2.58
Level of education	None	48	17.71
	Primary	72	26.57
	Secondary	88	32.47
	Tertiary	63	23.25
Religion	Christian	198	73.06
	Islam	30	11.07
	Others	43	15.87
Parity	0-2	206	76.0

	3-5	49	18.1
	>5	16	5.9

Majority 206 (76.0%) of the women who participated in this study have 1-2 children and are Christians (73.06%) and most of them 80(29.52%) and 45 (16.60%) fell within the age bracket of 28-37 and 23-27 respectively. Also, most 124 (45.76%) of the women are single and had attained secondary level of education 88 (32.47%).

#### **4.2 Prevalence of overweight and obesity among women of reproductive age in Bushenyi Town using BMI**

**Table 3: Prevalence of overweight and obesity by BMI**

Classification	Frequency (n=271)	Percentage (%)
Normal	89	32.84
Obesity ( BMI: $\geq 30$ kg/m <sup>3</sup> )	54	19.92
Overweight ( BMI: $\geq 25$ -29.9kg/m <sup>3</sup> )	128	47.24
Combined Overweight & Obesity	182 (271-89)	67.16

Results in the table 2, show that most 128 (47.24%) of the women were overweight while 54 (19.92%) of them were obese. The rest of the women who were sampled were normal 89 (32.84%).

#### **4.3 Socio-economic factors associated with overweight and obesity among women of reproductive age in Bushenyi town**

**Table 4: Socio-economic factors associated with overweight and obesity**

Variable	Category	Frequency (n =182)	Percentage
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<b>Occupation</b>	Employed	45	24.73
	Self employed	55	30.22
	Student	28	15.38
	House wife	32	17.58
	Unemployed	22	12.09
<b>Main source of income</b>	Own business	69	37.91
	Salary	45	24.73
	Parents	32	17.58
	Husband	36	19.78
<b>Average monthly income (UGX)</b>	<100,000	91	50.0
	100001 – 300000	58	31.87
	300001- 500000	21	11.54
	500001- 700000	10	5.49
	>700000	2	1.10
<b>House Ownership</b>	Owned	93	51.09
	Rented	89	48.91

**Table 5: Cross tabulation of the socio-economic factors associated with overweight and obesity among women of reproductive age in Bushenyi**

<b>Variable</b>	<b>Category</b>	<b>Overweight/Obesity (182)</b>		<b>P-value</b>
		<b>Yes, n (%)</b>	<b>No, n (%)</b>	
<b>Occupation</b>	Employed	27 (60.0)	18 (40.0)	0.048
	Self employed	21 (38.18)	34 (61.82)	
	Student	11 (39.29)	17 (60.71)	
	House wife	22 (68.75)	12 (31.25)	
	Unemployed	9 (40.90)	13 (59.1)	

<b>Main source of income</b>	Own business	40 (57.97)	29 (42.03)	0.030
	Salary	29 (64.44)	16 (35.56)	
	Parents	10 (31.25)	22(68.75)	
	Husband	26 (72.22)	10 (27.78)	
<b>Average monthly income (UGX)</b>	<100,000	32 (35.16)	59(64.83)	0.012
	100001 – 300000	22 (37.93)	36 (62.07)	
	300001- 500000	12 (57.14)	9 (42.86)	
	500001- 700000	2 (20.0)	8 (80.0)	
	>700000	2 (100.0)	0 (0.00)	
<b>House Ownership</b>	Owned	59 (63.44)	34 (36.56)	0.003
	Rented	38 (42.70)	51 (57.3)	

Results from the table above show that all socio-economic factors studied significantly influenced overweight and obesity among women of reproductive age in Bushenyi town. That is, occupation ( $p = 0.048$ ), main source of income ( $p = 0.030$ ), average monthly income ( $p = 0.012$ ) and house ownership ( $p = 0.003$ ).

**Table 6: Multivariate logistic regression for significant socio-economic variables associated with overweight and obesity among women of reproductive age in Bushenyi town.**

			<b>Confidence Interval</b>
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<b>Variable</b>	<b>Category</b>	<b>AOR</b>	<b>Lower</b>	<b>Upper</b>
<b>Occupation</b>	Employed	0.094	0.005	1.954
	Self employed	0.293	0.013	6.824
	Student	0.058	0.003	1.326
	House wife	<b>2.006</b>	0.000	3.295
	Unemployed	<b>1.233</b>	0.100	2.346
<b>Main source of income</b>	Own business	0.061	0.010	0.382
	Salary	0.014	0.001	0.220
	Parents	0.133	0.018	0.986
	Husband	0.780	1.256	2.865
<b>Average monthly income (UGX)</b>	<100,000	0.094	0.005	1.954
	100001 – 300000	0.293	0.013	6.824
	300001- 500000	0.058	0.003	1.326
	500001- 700000	0.006	0.000	0.295
	>700000	<b>1.0263</b>	2.564	3.785
<b>House Ownership</b>	Owned	<b>1.0452</b>	1.788	2.954
	Rented	0.4523	0.013	3.824

The results in the table above show that house wives were twice more likely to be overweighted and obese (AOR= 2.006). Also, women who are unemployed (AOR=1.233), who earn >700000 shillings (AOR=1.0263) and owned houses (AOR= 1.0452) are more likely to be overweighted and obese.

#### 4.3. Individual factors associated with overweight and obesity among women of reproductive age in Bushenyi Town

**Table 7: Individual factors associated with overweight and obesity by BMI ( $\geq 25 \text{ kg/m}^3$ )**

Variable	Category	Frequency (n = 182)	Percentage	p-value
<b>Physical activity participation (PAP)</b> <b>At home or work</b>	VPA	60	32.97	0.001
	MPA	122	67.3	
<b>Sedentary activity</b>	Yes	117	64.29	0.040
	No	65	35.71	
<b>Food intake</b>	Carbohydrate	82	45.05	0.023
	Proteins	60	32.97	
	Vegetables/fruits	40	21.98	
<b>Smoking</b>	Yes	5	2.75	0.524
	No	177	97.25	
<b>Alcohol intake</b>	Yes	122	67.03	0.02
	No	60	32.97	

**VPA**=Vigorous physical activity, **MPA**= Moderate physical activity **Sedentary activity** = time sitting at work, travelling, reading and watching television, playing games, excluding time spent sleeping. **Carbohydrates** (Posho, rice, sugar, chapatti, cassava, porridge, sweet potatoes, Irish potatoes). **Proteins** (meat, dairy and legumes).

Table 6 show that all the individual factors studied significantly influenced overweight and obesity among women of reproductive age in Bushenyi town except smoking ( $p=0.524$ )

Table 7: Multivariate logistic regression for significant individual variables associated with overweight and obesity among women of reproductive age in Bushenyi Town

Variable	Category	AOR	Confidence Interval	
			Lower	Upper
<b>Physical activity participation (PAP)</b> At home or work	VPA	0.725	1.566	2.345
	MPA	<b>1.025</b>	1.675	2.678
<b>Sedentary activity</b>	Yes	<b>2.455</b>	0.408	5.186
	No	1.000	1.000	1.000
<b>Food intake</b>	Posho	0.346	0.144	0.832
	Matooke	0.853	0.465	1.564
	Rice	<b>1.453</b>	2.672	3.672
	Potatoes	0.673	1.000	1.756
	Chapatti	0.765	1.000	1.577
	Milk	<b>2.710</b>	1.245	5.898
	Ghee	<b>1.969</b>	1.039	3.732
	Beans	0.749	0.390	1.437
<b>Alcohol intake</b>	Yes	<b>2.134</b>	1.2572	3.785
	No	0.645	1.245	2.345

Results in table 7 indicates that women in Bushenyi town who live sedentarily (AOR=2.455), those who take more milk (AOR = 2.710), consume alcohol (AOR = 2.134) and do moderate physical exercise are more likely to be overweighed and obese. Women who take ghee (AOR = 1.969) and eat rice (AOR= 1.453) are likely to also be overweighed and obese.

## **CHAPTER FIVE**

### **DISCUSSION**

#### **5.0 Introduction**

This chapter presents the discussions of the findings according to the specific objectives.

#### **5.1 Prevalence of overweight and obesity among women of reproductive age in Bushenyi.**

In this study, the prevalence of overweight, obesity and normal weight of women of reproductive age in Bushenyi town using anthropometric measurement of Body Mass Index (BMI) was found to be 47.24%, 19.92% and 32.84% respectively. Being female was the most significant factor associated with being overweight/obese. This agrees with findings of Mayega et al (2012) in Uganda, Gomes et al (2010) in Mozambique, Msyamboza et al (2013) in Malawi and Rudastsikira et al in Zambia.

The prevalence of overweight and obesity in this study agrees with findings of other studies that attributes high prevalence of overweight and obesity in African women but, disagrees with its predominant existence to urban areas as reported by Mbochi et al., (2012) and Kamadjeu et al., (2006). This study indicates that rural populations are also at risk of the nutritional disorder and it is on the rise. The result is however in absolute agreement with available data which indicates that the burden of obesity generally shifts towards the poorer groups as countries improve their level of economic development (Popkin, 2003).

Overweight and obesity prevalence in this study BMI is higher to that reported for southwestern Uganda by UDHS in 2011 as well as that reported by Kirunda et al., (2015) in rural eastern Uganda.

#### **5.2 Socio-economic factors associated overweight and obesity among women of reproductive age in Bushenyi town.**

Findings from this study, revealed that house wives were twice more likely to be overweighed and obese (AOR= 2.006). This finding agrees with the findings of Saboo et al (2014) who showed that being a housewife especially of a medium income class is associated with overweight and obesity.

The study also, found that women who were unemployed are overweighed and obese (AOR=1.233). However, this finding disagrees with that of Hughes & Kumari (2017) who reported higher chances of underweight among unemployed persons.

Findings of this study revealed that women who earn >700000 Uganda shillings (AOR=1.0263) were overweighed/obese. Higher monthly income could suggest higher standard of living and comfort being that a woman could afford most of the things she requires easily. This is in agreement with a study carried out among South African men and women which attributed overweight and obesity to wealth (Peer, Lombard, Steyn, Gwebushe, & Levitt, 2014). However, another study reported decreasing levels of overweight and obesity as income increases (Ogden et al., 2017).

In this study, women who owned houses were overweighed and obese (AOR= 1.0452). This could be attributed with the level of satisfaction and comfort achieved when a woman owns her residential house and vice visa. However other studies have reported a higher likelihood of home renting to overweight and obesity (Rehm, Moudon, Hurvitz, & Drewnowski, 2012)

### **5.3: Individual factors associated overweight and obesity among women of reproductive age in Bushenyi town.**

This study found that women in Bushenyi town who live sedentarily (AOR=2.455) were overweighed and obese. This can be attributed to the high unemployment as indicated earlier and can also be explained by ownership of a private business which requires sitting in one place all day. This study is consistent with a study by Cohen et al 2013, which found higher levels of sedentary activity among black women.

Finding from this study also show that women who take a lot of milk and ghee (AOR = 2.710 and AOR = 1.969) were overweight/obese. This is expected considering that the major animal protein consumed in this region is mostly dairy and its product being that the major occupation of the people in this region is agriculture and cattle rearing.

In this study, it was found that women who consume alcohol (AOR= 2.134) were overweight/obese. This finding agrees with by study in Kerala, India by Thankappan et al in 2010 who found that alcohol users have more risk to develop obesity compared with nondrinkers (OR = 1.26),

## **CHAPTER SIX**

### **CONCLUSION AND RECOMMENDATIONS**

#### **6.0 Introduction**

This chapter presents the conclusion and recommendations of the study according to the specific objectives of the study.

#### **6.1 Conclusion**

##### **Prevalence of overweight and obesity among women of reproductive age in Bushenyi.**

The findings of this study showed that majority of the women in Bushenyi town are either overweight obese or both. This implies that due to their sedentary lifestyles and consistent consumption of fatty and starchy food from milk and carbohydrates will continue to have a toll of the women and their health.

##### **Socio-economic factors associated overweight and obesity among women of reproductive age in Bushenyi town.**

The results of this study show that house wives were twice more likely to be overweighed and obese (AOR= 2.006). Also, women who are unemployed (AOR=1.233), who earn >700000 shillings (AOR=1.0263) and owned houses (AOR= 1.0452) are more likely to be overweighed and obese.

##### **Individual factors associated overweight and obesity among women of reproductive age in Bushenyi town.**

This study revealed that women in Bushenyi town who live sedentarily (AOR=2.455), those who take more milk (AOR = 2.710), consume alcohol (AOR = 2.134) and do moderate physical exercise are more likely to be overweighed and obese. Women who take ghee (AOR = 1.969) and eat rice (AOR= 1.453) are likely to also be overweighed and obese.



## **6.2 Recommendations**

### **Prevalence of overweight and obesity among women of reproductive age in Bushenyi.**

The high prevalence of overweight and obesity in Bushenyi town as shown in this calls for behaviour change related towards lifestyle, occupation and diet. Hence public health interventions through awareness programmes about the consequences of overall and abdominal obesity should be propagated by government and health partners.

### **Socio-economic factors associated overweight and obesity among women of reproductive age in Bushenyi town.**

The women employed and unemployed women should be encouraged to walk often.

### **Individual factors associated overweight and obesity among women of reproductive age in Bushenyi town.**

Regular exercises should be done by the women couple with their work schedules.

The district authorities should conduct regular nutrition and dieting programmes for women and men in the area to improve on their eating habits

### **Area for further Studies**

A study on overweight and obesity among men in Bushenyi district using other anthropometric measures like waist circumference and waist to height ratio can be conducted.

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## APPENDIX 1: CONSENT FORM

My name is.....I am a student of Kampala International University currently in my last semester in the Faculty of Clinical Medicine & Dentistry. As part of the requirements for the fulfillment of the programme I am conducting a research study titled: **Socio-economic and Individual factors associated with overweight and obesity among women of reproductive age in Bushenyi district, western Uganda.**

I hereby seek your consent to be part of this study. Your responses will be kept strictly confidential for all matters and it will only be used for the purpose of the study mentioned above. Your name will not be mentioned to protect your confidentiality.

You have a right to answer or not for questions which might be inconvenient for you. If you have any questions about the study, you may raise.

Thank you in advance for your cooperation.

### **Consent acknowledgement by the respondents.**

I agree/ I don't agree to participate in this research voluntarily -----

Interviewer name -----signature.....



## APPENDIX II: QUESTIONNAIRE

**INSTRUCTION: Kindly underline your response.**

<b>PART 1: SOCIO-ECONOMIC DATA</b>	
<b>Q1.</b> Age:	<b>Q2.</b> Religion? 1= Christian 2= Muslim 3= Other
<b>Q3.</b> What is your marital status? 1 = Single    2= Married    3= Divorced    4= Widowed	<b>Q4.</b> What is your highest education level? 1= None    2= Primary    3= High school    4= College
<b>Q5.</b> How many children have you ever given birth to?    1= none    2= 1-2 children 3= 3-5children    4= >5 children	<b>Q6.</b> Are you working at present to earn an income?    1= Yes    2= No
<b>Q7.</b> What is your main occupation? 1= Self-employed    2= Formally employed 3= Other	<b>Q8.</b> What is your main sources of income? 1= Salary    2= Private business    3= Husband    4= Other
<b>Q9.</b> What's the status of this house you live in? 1=Rented 2= Owned 3= Other	<b>Q10.</b> On average how much income do you get per month? Ush.....
<b>PART 2: INDIVIDUAL FACTORS</b>	
<b>Physical activity</b>	
<b>Q11.</b> Does your work involve vigorous intensity activity    1= Yes    2= No (If no, go to Q.21)	<b>Q12.</b> In a typical week, on how many days do you do vigorous-intensity Activities ? .....
<b>Q13.</b> How much time do you spend doing vigorous-intensity activities. ...Hrs....Min	<b>Q14.</b> Does your work involve moderate-intensity activity? 1=Yes 2= No (If No. go to Q24)
<b>Q15.</b> How many days do you do moderate intensity activities weekly? ..... days	<b>Q16.</b> How much time do you spend doing moderate-intensity activities in a day? ....Hrs. ....Min
<b>Travel to and from places</b>	
The next questions <b>exclude the physical activities at work</b> that you have already mentioned.	

<b>Q17.</b> Do you walk or use a bicycle for at least 10 minutes to get to and from places? 1= Yes 2=No (If No, go to Q.26)	<b>Q18.</b> How many days do you walk or bicycle for at least 10 minutes in a week? .....Days	
<b>Q19.</b> How much time do you spend walking or bicycling in a day?... Hrs.....Min		
<b>Q24.</b> How many days do you do moderate-intensity recreational activities in a week? .....days	<b>Q25.</b> How much time do you spend doing moderate-intensity recreational activities in a day? .....Hours ..... Minutes	
<b>Q26.</b> How much time do you usually spend sitting or resting on a typical day? .....Hours .....Minutes		
<b>A. DIETARY / MEAL CONSUMPTION FREQUENCY</b>		
<b>Q27.</b> How many times did you consume the following foods in the last 7 days? Indicate by choosing from the options 1-8. 1= Once 2 =Twice 3= Thrice 4= Four times 5= Five times 6= Six times 7= Daily 8 =Never		
<b>CEREALS, CARBOHYDRATES, STARCH</b>		
Posho	White rice	Porridge
Chapatti	Matooke	Chips
<b>ROOTS AND TUBERS</b>		
Yams	Sweet potatoes	Cassava
<b>DIARY FOODS</b>		
Milk	Yoghurt	Ghee
<b>MEAT, MEAT PRODUCTS, EGGS</b>		
Beef	Chicken	Pork
Fish	Eggs	
<b>LEGUMES/ NUTS</b>		
Dry beans	Dry peas	Ground nut
<b>VEGETABLES</b>		

Cabbage		Carrots		Tomatoes	
<b>FRUITS</b>					
Oranges		Passion		Pineapple	
Mangoes		Water melon		Pawpaw	
Avocado		Banana			
<b>SUGAR AND ALTERNATIVE SWEETS</b>					
Sugar		Honey		Sweets	
<b>BEVERAGES</b>					
Soda		Juice		Alcohol	
<b>PART 4: ANTHROPOMETRIC MEASUREMENT</b>					
Weight (kg)		Height (cm)			

### APPENDIX III: WORK PLAN

Activity	Time frame 2018									2019								
	July to September		October to November		Dec.		January		February		March		April		May			
Selection of topic/proposal writing																		
Submission of proposal & correction																		
Data collection/analysis																		
Reporting writing																		
Submission of research report																		