CHAPTER-I
INTRODUCTION

Obesity is a condition that develops from chronic quantitative imbalance between energy intake and energy expenditure leading to an excessive accumulation of adipose tissue within the body (Bray and Bellanger 2006). Department of Health, UK (2011) defined overweight and obesity as clinical terms used to describe the excess of body fat. Both overweight and obesity are often used interchangeably, but they do not represent the same situation. Some individuals may be overweight but not obese, while obese individuals are overweight above a certain degree. Obesity is a state of being seriously overweight to the stage where it becomes a risk factor for the degeneration of health. The word obesity is derived from the Latin word *Obesus*, which means stout, fat or plump while *Esus* means to eat (Onion et al. 1996). Obesity is a new phenomenon in human evolutionary history, having been essentially nonexistent until approximately 10,000 years ago (Brown 1991; Brown and Krick 2001). It is known in ancient Greece (Bevegni and Adami 2003) and it was a common condition among the English upper classes in the late eighteenth century (Trowell 1975). More generally, it emerged among North American men in the nineteenth century (Kahn and Williamson 1994) and increased according to successive surveys in both the United States and Britain across the twentieth century (Garrow 1978).

Over the past 60 years, social, economic, and technological changes have altered patterns of life worldwide. During post–World War II reconstruction, economic development grew on a more-global scale, as colonial models of economic management fell from favour (Ulijaszek and Lofink 2006). Increasing energy consumption resulted in height and weight increases throughout the nineteenth century in the developed world. However, as populations reached their genetic potential for height in the twentieth century, weight increased disproportionately, resulting in obesity. By the year 2000, the human race reached a landmark where the number of adults with excess weight is higher than that of normal weight (Caballero 2007).
The etiology of obesity is multi-factorial, which includes genetic, metabolic, cultural, psychological and environmental factors. Although obesity is affected by many factors, the rapid increases in the prevalence of obesity across the world in a relatively short time are broadly attributed to environments that are obesogenic (French et al. 2001; Brownell 2002; Hill et al. 2003). Swinburn et al. (1999) who coined the term obesogenic environment has argued that the physical, economic, social and cultural environments of certain nations encourage positive energy balance in their populations. A dominant explanatory framework for the emergence of obesogenic environments is that of nutrition transition (Popkin 2004) and changing food environments across the nations of the world (Drewnowski and Popkin 1997; Griffiths and Bentley 2001; Contaldo and Pasanisi 2004). Central to this transition are rapidly changing lifestyles and shifts in diet through globalization, urbanization, mechanization of jobs and transportation. Coupled with these, the increased availability of processed and fast foods and increasing dependence on television for leisure result in people consuming more energy dense, nutrient poor diets adopting while pursuing physically less active lifestyles (Bell et al. 2002; WHO 2003; Popkin 2009). These changing lifestyles and food environments have led to the increasing prevalence of obesity across the world.

There is now a mounting concern about the increasing prevalence of overweight and obesity that have occurred during the last few decades. It was, however, only in 1997 that WHO identified obesity as a major public health problem and warned the global community of the looming epidemic of overweight and obesity that would affect many countries worldwide (WHO 2000). Obesity is now declared among the top 10 health risks in the world and is the fifth leading risk for global deaths (WHO 2002, 2011). Once considered a problem of affluence, obesity is now fast growing in many developing country and poor neighbourhoods of the developed countries (WHO 2003). Even in the countries like India and Africa, which are typically known for under nutrition, a significant proportion of overweight and obese people now coexist with those who are under nourished (Popkin 2002; Berman 2009).

Obesity is one of the biggest health problems that affect a person not only physically but psychologically as well. The health risks associated with obesity
depend on where the fat is located (Arner 1998). Individuals with peripheral obesity (fat located on the buttocks, hips and thighs) have fewer health risks than those with central obesity (fat located around the stomach and gut). Hypertension, heart disease, diabetes, gall bladder disease and asthma have links to obesity (Saw and Rajan 1997; WHO 1998; American Academy of Pediatrics 2003; Mishra 2004). In addition, obesity or significant overweight can contribute many problems in women’s reproductive system like prolonged or heavy periods, menstrual pain, delayed ovulation, infertility, breast cancer, ovarian cancer etc. (Shannon 1993). Almost 30,000 deaths per year are currently attributed to obesity and with the significant increases in its prevalence it is projected that obesity will overtake smoking as the major avoidable cause of premature death by 2030 (Haslam et al. 2006).

There are several methods for estimating body fat such as body mass index (BMI), waist-hip circumference, skin-fold thickness, bioelectrical impedance analysis (BIA), dual X-ray absorptiometry (DXA) and magnetic resonance imaging (MRI) (Snijder et al. 2006). Each of these measures has their strengths and weaknesses, and there is no consensus on which measure is the best (Freedman and Perry 2000; Burkhauser and Cawley 2008). For the present research, I have opted to focus on BMI, as it is the preferred measure by the WHO while it is also used widely in social science research related to obesity (Burkhauser and Cawley 2008). BMI is the most commonly used measure to estimate adult obesity globally. The Belgian statistician, astronomer, and social scientist Adolphe Quetelet is first to conceive the idea of BMI in the mid 1800s. It is a measure expressing the relationship of weight-to-height². It is widely regarded as a straightforward tool for measuring adult obesity, as it correlates significantly with body fat and can be calculated easily in a clinical setting (Aronne 2002). BMI has been used for many large-scale epidemiological studies and only individuals who are unusually muscular could be misclassified as overweight or obese (Prentice 1998). The lower cut-off points for BMIs are used to categorize overweight and obese conditions for Asian populations (WHO 2000). The classification for obesity in children is complicated and is not a perfect measure because during childhood there are sporadic changes in height and body composition. However, internationally based cut-off points have been published (Cole et al. 2000; Edmunds et al. 2001). Although BMI is a widely used method for defining overweight and
obesity, it must be acknowledged that the cut-off point is arbitrary and the main function of these categories is to enable comparisons with other countries (James et al. 2001). The BMI cut-off point indicates the increased risk of health complications. It does, however, not mean that everyone with a BMI greater than 30kg/m² will develop obesity-related health problems. “We cannot foretell who will develop on obesity related health problem. In fact, some persons who meet the criteria for obesity will live long lives free of any of the morbidities known to be influenced by obesity” (Heshka and Allison 2001:1402). It does have some limitations, as it does not take into account factors such as gender and age. Women typically have a higher percentage of body fat mass than men with the same BMI and it is well established that ageing process increases the level of centrally distributed body fat (Ross 1994; Molarius et al. 2000).

**Statement of problems**

The WHO Expert Consultation on Obesity held in 1997 has warned the global community of an escalating epidemic of overweight and obesity that is affecting many countries worldwide (WHO 2000). Until recently, obesity was considered a condition affecting only residents of developed countries, especially in the United States and Europe. However, in recent years, obesity has become a worldwide problem (WHO 2000), now rapidly increasing in developing countries (Popkin and Gordon-Larson 2004). According to the recent assessment by the World Health Organization, over a third of people are now overweight or obese. Within two decades, if the current trends continue, the number will be more than two-thirds (Kelly et al. 2008). Numerous studies have also corroborated the relationship between weight gain and increased risk of death in both developed and developing countries. Even in Africa, a continent usually associated with malnutrition, obesity is increasing, and it is predicted that obesity related diseases will be a leading cause of death in sub-Saharan Africa by 2020 (Berman 2009). It has also been predicted that the growth in the number of severely overweight adults will be double than underweight during 1995-2025 (WHO 1998). Almost 30,000 deaths per year are currently attributed to obesity and with the significant increases in its prevalence it is projected that obesity will overtake
smoking as the major avoidable cause of premature death by 2030 (Haslam et al. 2006).

India, being a developing country with high levels of under nutrition, the prevalence of overweight and obesity has been increasing rapidly with the increasing urbanization and economic growth in the past few decades. This increasing urbanization has predisposed many individuals to lifestyle factors associated with obesity. These could lead to large proportion of the Indian population at risk of obesity and associated chronic diseases in the coming decades (Singh et al. 2000). Along with urbanisation, the impacts of nutrition transition through economic growth and westernization among the urban peoples has seen in increased consumption of high-fat diets, processed foods and meals eaten outside home. Further, urban environments are also associated with less physically demanding occupations, reductions in physical activity from increased leisure time, occupational shifts and a lack of exercise opportunities and facilities (Shetty 1999; Monteiro et al. 2000). The situation in India is more alarming, perhaps especially among the peoples of Northeast India among whom rural-urban migration is increasing rapidly (Khongsdier 2008). Increasing rural-urban migration, Khongsdier (2008) continues, not only brings change in dietary and physical activity patterns but is also likely to predispose many individuals to obesity, diabetes, hypertension and other risks of CHD. Manipur, a North-Eastern State, has seen tremendous changes in recent years through urbanization and modernization. The process of urbanization and globalization accompanied by increasing motorized transportation and technological development has brought changes in the people’s lifestyles with more sedentary, inactive physical activities, patterns of food habits. Such an increase in urbanization and globalization has also brought about the availability of calorie dense western foods, cheap vegetables oils and fats, which, in turn, altered the traditional food environment. The altering food environment in Manipur could be observed with the increasing numbers of fast food restaurants and roadside vendors (Dkhar and Singh 2012). Westernization and improved social and economic conditions is another factor that leads to the reduction of physical activities amongst the urban peoples. The presence of available and affordable transportation systems, sedentary jobs and remote controlled appliances have reduced physical activities. The technological development such
computer and video games, children are living more sedentary and spending lesser time playing outdoor activities. Such a rapid changing lifestyles through urbanization and westernization coupled with economic growth might lead to the increasing prevalence of obesity, and turn it into a challenging problem in the near future. There is a need to educate the public and create an awareness programme about the problem of obesity in Manipur. From this point of view, an intensive research on the dynamics of obesity and its associated health problems is needed to understand and formulate effective programmed to enhance the quality of life of the people. However, due to paucity of data, the present understanding of the causes and consequences of this rapidly growing public health threat remains poor in the State. Therefore, this study is an attempt to understand the dynamics of obesity among men and women in Manipur.

**Objectives of the study**

The objectives of the study are the following:

1. To find out the incidence of overweight and obesity among the urban Meitei adolescents (aged 14-19 years) and adults (aged 20-60 years) using anthropometric measurements and indices.
2. To analyze how overweight and obesity associated with different variables such as socio-economic factors, lifestyles and dietary habits.
3. To understand the self-reported morbidity according to their BMI status.