

**KNOWLEDGE AND ATTITUDES OF PHYSIOTHERAPY STUDENTS AT  
THE UNIVERSITY OF THE WESTERN CAPE TOWARDS OBESITY.**

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**A mini thesis submitted in partial fulfillment of the requirements for the degree  
of Master of Science (Physiotherapy) in the Department of Physiotherapy,  
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## **ABSTRACT**

The increasing prevalence of obesity in both developed and developing countries and its associated health risks have brought the issue of obesity prevention and management a public health debate. Health care professionals have been identified to have a role to play in directing the future of obesity management. However, among the numerous barriers for effective management of obesity is lack of knowledge of causes of obesity and negative attitudes towards obese patients by health care professionals. With limited or no studies available for the physiotherapy setting, the aim of the study was to determine the knowledge and attitudes of students of Physiotherapy at the University of the Western Cape, South Africa towards obese individual. A descriptive quantitative research design using a cross-sectional survey was used. One hundred and seventy five (175) students of Physiotherapy took part in the study using a convenience sampling technique. Data was collected by means of a structured, self-administered questionnaire adopted from the Obesity Risk Knowledge-10 scale, Beliefs About Obese Person scale and the Fat Phobia Scale. A response rate of 77.3% was obtained. Descriptive and inferential statistics were employed to describe the relationship and association between variables. Alpha level was set at 0.05. The mean age of the sample was 21.54 (SD = 4.903). Females constituted 73.5% and males 26.5% of the sample. The results showed that majority of the students of Physiotherapy (85%) reported having received no formal education regarding obesity. Almost all the participants understood the medical consequences of obesity and the majority demonstrated average knowledge regarding health risk of obesity, but only 23% felt qualified to advise obese patients. The majority of the participants (88.8%) also rated behavioural factors (lack of exercise and overeating) predominantly as the cause of obesity while most viewed obese people as lazy,

unattractive, insecure and lower self-esteem. The study clearly highlighted that study participants view obesity as largely a behavioural problem and share the broader society's negative attitudes towards obese people. There is thus an urgent need to improve the physiotherapy training curriculum with regards obesity education. This is vital not only to improve knowledge and skills in obesity management approaches but also to help improve positive attitudes towards obesity and the people who are obese.



**DECLARATION**

I hereby declare that ‘**KNOWLEDGE AND ATTITUDES OF STUDENTS OF PHYSIOTHERAPY TOWARDS OBESITY AT THE UNIVERSITY OF THE WESTERN CAPE** is my own work, that it has not been submitted, or part of it, for any degree of examination at any other university, and that all sources I have used or quoted have been indicated and acknowledged by means of complete references.

Awotidebe Adedapo Wasiu

Signature.....

November 2008

Witness



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## **DEDICATION**

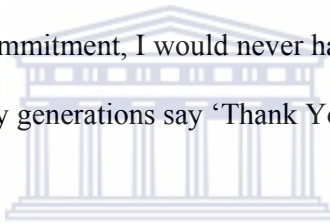
This work is dedicated to my loving parents Mr. and Mrs. A. N. Awotidebe, without their efforts I would not be where I am.



## ACKNOWLEDGEMENT

Much adorations and praises to the Almighty, the ever living, nourisher of our souls and bestower of knowledge, as the number of His creatures, to the extent of His pleasures, as weighty as His throne and as numerous as His words, who in His infinite mercy brings this programme to a successful end. Peace and blessing of the Almighty on His messenger, the noble prophet Mohammed (SAW), his household and all those who follow his teachings till the end of time (amen).

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Finally, I will always be full of praise to God Almighty, for His mercy and car, my shortcoming notwithstanding. The journey has just started, guide me through oh Lord.

***Our true wealth is the good we do in this world. None of us has faith unless we desire for our neighbours what we desire for ourselves .....Prophet Mohammed (s.a.w.)***

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## ABBREVIATIONS

<b>AIDS:</b>	Acquired Immune Deficiency Syndrome
<b>BAOP:</b>	Belief About Obese Person Scale
<b>BMI:</b>	Body Mass Index
<b>CHD:</b>	Coronary heart disease
<b>CHS:</b>	Community and Health Sciences
<b>CVD:</b>	Cardiovascular disease
<b>FPS:</b>	Fat Phobia Scale
<b>HIV:</b>	Human Immuno Virus
<b>HOD:</b>	Head of Department
<b>IAT:</b>	Implicit Association Test
<b>RN:</b>	Registered Nurse
<b>SES:</b>	Socio-economic status
<b>SPSS:</b>	Statistical Package for Social Sciences
<b>UK:</b>	United Kingdom
<b>USA:</b>	United States of America
<b>UWC:</b>	University of the Western Cape
<b>WCRF:</b>	World Cancer Research Fund
<b>WHR:</b>	Waist-hip ratio
<b>WHO:</b>	World Health organization

**KEYWORDS**

OBESITY

OVERWEIGHT

ATTITUDES

BELIEFS

KNOWLEDGE

BIAS

BODY MASS INDEX

PHYSIOTHERAPY

CURRICULUM

PRACTICE

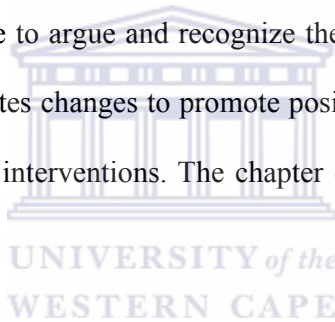


# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 INTRODUCTION TO THE CHAPTER**

In this chapter, the background of the study elucidates on the growing concern of the obesity health burden in both industrialized and developing nations and increasingly barriers to accurate diagnosis and effective management of this condition. The statement of the problems, aims, and specific objectives are stated. Finally, the significance of the study calls for the need to train physiotherapists who will be best suited to direct the future programmes of obesity prevention. For this to be achieved effectively, one must be able to argue and recognize the causes and consequences of obesity. It further demonstrates changes to promote positive attitudes and willingness to engage in weight control interventions. The chapter ends with definition of terms used in the study.



### **1.2 BACKGROUND OF THE STUDY**

Obesity has become a global health epidemic and a major public health issue with evidence now showing that the prevalence of obesity is increasing at an alarming rate in both developed and developing countries (World Health Organisation, 2003). The World Health Organisation recognises obesity as a risk factor for non-communicable diseases in which more than one billion adults worldwide are overweight and approximately 300 million are obese (World Health Organisation, 2006). Its prevalence in Western nations such as the United States is as high as 27 % in men and 32 % in women above the age of 20 years (World Health Organisation, 2005). However, the burden of overweight and obesity is not only that of Western worlds as

countries undergoing economic transition such as South Africa, Brazil, and China have also been implicated (Popkin, 1994; Pouane *et al.*, 2002). The study of Pouane *et al.* (2002) estimated that the prevalence of overweight and obesity in South Africa is quite high with more than 29 % of men and 56 % of women being classified as overweight or obese.

The high prevalence of overweight and obesity and its strong link with a major predictor of a number of life-threatening and debilitating conditions such as type 2 diabetes, coronary heart diseases, some cancers, female infertility, respiratory disorders, and back pain has made overweight and obesity a subject of considerable primary concern on the agenda of the public health (U S Department of Health and Human Services, 2001).

Overweight and obesity are believed to develop as a result of rapid changes in eating patterns and increasingly sedentary lifestyles (Bourne, Lambert, & Steyn, 2002). Strategies to reduce energy intake through dietary change and increasing energy expenditure by increasing physical activity levels seem not only to be practically modifiable but also considered the most effective means of weight loss intervention (WHO, 2003; United States Department of Health and Human Services, 2001). Moreover, the effect of exercise training has been reported to play a major role in the management of obesity either through weight reduction, or by improving physiological determinants such as blood pressure, blood glucose and cholesterol levels (Garrow, 2000), improvement in quality of life (Karlsson, Sjostrom & Sullivan, 1998), relief in symptoms associated with dyspnea and chest pain and reduction in number of sick leaves among others (Karason, Lindros, Stenlof & Sjostrom, 2000). In spite of the importance of lifestyle changes in the effective management of weight,

there is a concern however that overweight and obesity is due in part to genetic and hormonal influences (Snyder *et al.*, 2004). This however raises a concern when public health and clinical interventions focus almost exclusively on encouraging patients to eat less and exercise more without acknowledging other causes of obesity (Thomas, Hyde, & Komesaroff, 2007).

In view of this, studies have shown that the society is not receptive for obese individuals. It is not unexpected that this pervasive negative attitude is rampant in the general population given the constant messages that being 'slim' is associated with success and beauty (Puhl & Brownell, 2001). Interestingly, unlike the stereotypes against other minority groups such as refugees, people with disabilities which are frowned at, negative attitudes against obese people are accepted and even encouraged (Puhl & Brownell, 2001). An example is the emergence of a reality TV shows about obesity and weight loss (*Biggest Losers*) where contestants compete to lose weight and win cash. This novelty idea has been criticized because it is seen as reinforcing being obese as the individual's fault and that an individual should take personal responsibility for weight loss (Thomas *et al.*, 2007).

However, this widespread negative attitudes towards obese people cut across all walks of life, and what is more disturbing is that it is equally prevalent among health care professionals and other obesity specialists (Faith, Leone, Ayers, Heo, & Pietrobelli, 2002; Puhl & Brownell, 2001). Unfortunately, one would not have expected this negative attitude to exist among health care professionals working in obesity management. Literature on the study of obesity and attitude has indicated that this negative view is not only directed towards obesity as a condition but also against the people who are obese (Teachman & Brownell, 2001). Some studies have reported

negative attitudes and other forms of stereotypes among various groups of health care professionals including dietitians (Oberrieder, Walker, Monroe, & Adeyanju, 1995), nurses (Maroney & Golub, 1992), and physicians (Helb & Xu, 2001; Loomis, Connolly, Clinch, & Djuric, 2001). Students training in areas of dietetics (Berryman, Dubale, Machester, & Mittelstaedt, 2006), exercise science (Chambliss, Finley, & Blair, 2004), nursing (Culbertson & Smolen, 1999) and medicine (Wiese, Wilson, Jones, & Neises, 1992) have also been reported to have negative attitudes towards obese people.

The negative attitudes among the health care professionals have been linked to beliefs about causes of obesity and the notion of personal responsibility of weight gain (Dejong & Kleck, 1986), lack of knowledge of healthcare professionals in nutrition and obesity (Block, DeSalvo, & Fisher, 2003; Moore, Adamson, Gill, & Waine, 2000), perceived inability to change patient behaviours (Kushner, 1995), and the belief that obesity is under personal control and perceptions of individual responsibility and blame (Hash, Munna, Vogel, & Basson, 2003; Frank, 1993).

There is a concern that this negative belief towards people who are obese among the health care professionals will not only compromise their clinical judgment but also dissuade obese patients from seeking medical assistance (Puhl & Brownell, 2001; Drury & Louis, 2002). These aspects of stereotypes and weight bias have negative consequences on the psychological well-being and quality of life of the obese patient (Friedman, Reichmann, Costanzo, Zelli, Ashmore, & Musante, 2005; Kolotkin, Meter & Williams, 2001). Furthermore there is a reluctance to seek health care because of stigmatization, which prevents early management of obesity and increases the

likelihood of obesity mortality and economic cost (Thompson, Brown, Nichols, Elmer, & Oster, 2001; Sansone, Sansone, & Wiederman 1998).

Forman-Hoffman, Little, and Wahls (2006) observed in their study that physical therapists are integral members of the health assessment team that obese clients are referred to for further treatment. However, no work to the researcher's knowledge has explored the knowledge of and attitudes towards obesity among the physiotherapists. It is important for the physiotherapist or students of Physiotherapy to be equally aware of their attitudes towards obese clients and take appropriate measures to ameliorate it.

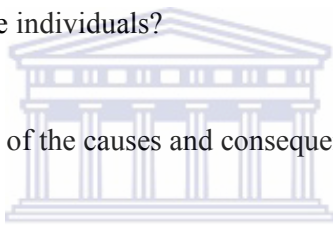
### **1.3 PROBLEM STATEMENT**

Lack of knowledge and / or negative attitudes towards overweight and obesity have been identified as barriers for effective management of this condition. The focus of health promotion is to make healthier choices an easier choice by ensuring individuals make informed decisions regarding their health (World Health Organisation, 1986). Health education and interventions focus primarily on weight loss and weight maintenance, instead of providing health risk messages that have been found to be effective in the anti-smoking strategies incorporated in persuasive, innovative and supported by advice (Schar & Gutierrez, 2001). Students training to become professionals are the future of obesity interventions, and to do this effectively, they must be able to argue and recognise the complex nature of obesity aetiology and willingness to engage in weight control interventions. To date no study about knowledge and attitudes of physiotherapy students has been done. It is in this regard that the study of this kind is needed to assess if educational training is sufficient enough to prepare them for the obesity epidemic in South Africa and elsewhere.

## **1.4 RESEARCH QUESTION**

The study seeks to explore the following research questions:

- What are physiotherapy students' knowledge of and their attitudes towards obesity?
- Does knowledge of obesity among physiotherapy students have an influence on their attitudes towards obese patients?
- What are their perceived responsibilities in counseling and designing exercise programmes for obese individuals?
- What are their beliefs of the causes and consequences of obesity?



## **1.5 AIM OF THE STUDY**

The primary aim of this study is to determine the knowledge of, and attitudes towards obesity among students of physiotherapy.

## **1.6 SPECIFIC OBJECTIVES**

In realizing the aim of this study and provide answers to the questions above, this work will seek:

- To determine the knowledge of obesity among physiotherapy students at the University of the Western Cape (UWC).
- To determine the attitudes of physiotherapy students at the UWC towards obesity.



- To determine the association between socio-demographic factors of physiotherapy students and their knowledge of and attitudes towards obesity.
- To determine the association between knowledge of the consequence of obesity and attitudes of physiotherapy students at the UWC towards obesity.

## **1.7 SIGNIFICANCE OF THE STUDY**

Frank (1993) concluded that negative attitudes towards obese patients may be a barrier to good practice among healthcare professionals involved in their management. Understanding physiotherapy students own knowledge and attitudes towards obesity could be a first and effective step in devising intervention strategies to promote positive attitudes towards obese people. Furthermore, information gained in this study could assist in the improvement of training programmes for the students of physiotherapy at the University of the Western Cape with specific emphasis on physiotherapy practice and attitudes towards obese patients.

## 1.8 DEFINITION OF TERMS

The terms **overweight** and **obesity** are frequently used interchangeably to describe the condition of excess weight, but in a health context are distinguished by using body mass index (BMI).

**Overweight** and **Obesity** are conditions of abnormal or excessive accumulation of body fat identified by a Body Mass Index (BMI)  $\geq 25$  and  $\geq 30$  kg/m<sup>2</sup> respectively (World Health Organization, 2003).

**Physiotherapy** is a “health care profession concerned with identifying and maximizing quality of life and movement potential within the spheres of health promotion, intervention, habilitation, and rehabilitation to promote physical, psychological, emotional, and social wellbeing of an individual or population (World Confederation of Physical Therapy, 2007).

**Attitude** is an abstraction or theoretical construct, used to indicate and summarize psychological tendencies, particularly where these indicate a favourable or unfavourable evaluation of an entity (Smith & Mackie, 2000).

**Antifat attitudes** may be defined as prejudicial responses directed towards individuals because of their obesity (Morrison & O’Connor, 1999).

**Knowledge** is the capacity to acquire, retain and use information; a mixture of comprehension, experience, discernment and skill (Badran, 1995).

## **1.9 SUMMARY OF CHAPTERS**

Chapter one includes the rationale, aims and significance of the study. The overall objective of the study is to determine the knowledge and attitudes of physiotherapy students at the University of Western Cape towards overweight and obesity.

Chapter two presents a review of relevant literature to understand the need for the study. It focuses on factors that influence knowledge and attitudes towards obesity. The current situation of overweight and obesity in South Africa, health consequences of obesity and interventions to treat and prevent obesity are reviewed. Factors influencing effective management of overweight and obesity were also reviewed; the factors include socio-economic and cultural factors; and perceptions and beliefs about weight. The implications for the physiotherapist in obesity interventions are also reviewed.

Chapter three considers the methodological issues relevant to the study. It also provides an overview of the study design. Other aspects discussed in this chapter include, but are not limited to, research settings, procedures, and the study sample and data analysis.

Chapter four contains the results of the statistical analysis of the data that attempt to answer the objectives stated in chapter one.

Chapter five presents the discussion of the results presented in chapter four.

Chapter six draws conclusions based on the study. It also attempts to make recommendation based on the study. The limitations of the study are also outlined.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

The chapter reviews relevant literatures on the prevalence and consequences of overweight and obesity. The role of behavioural, genetic, and socio-cultural factors in the obesity epidemic are also reviewed. Reviewed also are the evolving health evidences regarding the effectiveness of intervention strategies for obesity. The chapter concludes on the relationship between health care professionals and behaviour and the role of physiotherapists in the management of overweight and obesity.

#### **2.2 AN OVERVIEW OF OBESITY**

A review of literature provides evidence that overweight and obesity is now reaching epidemic proportions, it is increasingly becoming a problem in both the developed and developing nations (Seidell, 2005) affecting not only adults but also children and adolescents (Ogden, Carroll, Curtin, McDowell, Tabak, & Flegal, 2006; Chinn & Rona, 2001). According to Commuzie (2001), the rapid increase in the prevalence of overweight and obesity is attributable not only to genetic, metabolic and hormonal influences, but also as a result of an obesogenic environment that promotes lifestyle behaviour (Wadden, Foster, & Brownell, 2002).

Studies have shown that obesity is affected by genetic and hormonal influences in addition to dietary intake and sedentary lifestyles (Comuzzie, 2001). Similarly, evidence suggest that some inherited genes are associated with a higher risk of obesity as demonstrated in identical twins raised in different environments (Stunkard, Harris,

Pedersen, & McClearn, 1990). A considerable body of research further highlights that an individual with a family member of history of obesity, has a 3 times probability of being obese than an individual without a family history of obesity (Ochoa *et al.*, 2005; Whitaker, Wright, Pepe, Seidell, & Dietz, 1997). Finally, Perusse *et al.* (1996) indicated that the proportion of an individual's abdominal fat is influenced by a genetic component which accounts for an average 55 % of individual variations. It is clear that while some people are prone to accumulation of excessive fat and struggle to shed this fat, others do not have this problem despite exposure to the same environmental factors.

Moreover, Barker (1995) indicated that *in vitro* undernutrition of the developing foetus during embryological development may indicate the onset of obesity and other metabolic complications in later life. The author further explained that an adverse maternal malnutrition causes defects in the function of body organs making them susceptible to environmental stresses in later life.

Furthermore, a study conducted in the United Kingdom by the National Audit Office (2001) showed that apart from genetic factors, changing dietary patterns and increasingly sedentary lifestyles are major risk factors for obesity. A review of the literature provides evidence that a strong association exists between consumption of fat energy dense foods, physical inactivity, and obesity (Abelson & Kennedy, 2004). Researchers have stated that the rapid increase in the prevalence of obesity over the past decades is attributed to high energy dense food and physical inactivity (Abelson & Kennedy, 2004; Stein & Colditz, 2004; Harvey & Hill, 2001). In a study done in United States, the sharp increase in the prevalence of overweight and obesity is attributed to the environment that promotes physical inactivity and high energy dense

fatty foods (Wadden *et al.*, 2002). Other studies have also found that individuals with low level of vigorous physical activity are more likely to be overweight (Gutin, Yin, Humphries, & Barbeau, 2005). However, Westerterp and Goran (1997) emphasized that such association do not always indicate cause and effect relationship, as it is difficult to ascertain whether obese people are less active. A study in South Africa showed that increasing fatty food consumption among the urban dwellers apparently contributed to the prevalence of overweight and obesity (MacIntyre, Kruger, Venter, & Vorster, 2002).

On the contrary, other studies in South Africa, established a weak correlation between dietary pattern and BMI of South Africans indicating no direct relationship between the prevalence of obesity and increased fat intake (Kruger, Venter, & Vorster, 2001; Bourne, Langenhoven, Steyn, Jooste, Nesamvuni, & Loubser, 1994). Blundell and MacDiarmid (1997) further highlighted the inverse association between high fat diets and obesity meanwhile cross-cultural dietary studies failed to show consistent association.

Trowell and Burkitt (1981) reported that obesity was the first of the so-called 'diseases of civilization' to emerge. The decrease in energy expenditure as a result of modernization and other societal changes that promote a decline in work-related activities and leisure time dominated by sedentary activities and other physically inactive pastimes has increased over the years (Ferro-Luzzi & Martino, 1996). This trend generally indicates that the steady increase of overweight and obesity are greater in urban areas (Monteiro, Mondini, Medeiros de Souza, & Popkin, 1995). Additionally, the increasing proportions of urban dwellers in most developing nations is a growing concern to public health as this has grown from 16.7% in 1950 to 37% in

1994 and is predicted to rise to an astronomical 57% by the year 2025 (World Urbanization Prospect, 1995). Moreover, many developing countries are becoming increasingly dependent on imported non-traditional foods, and are also faced with problem of rural-urban migration of people in search of work that are mostly sedentary in nature (Drenowski & Popkin, 1997; Raikes, 1988). A review of the literature provides evidence that in South Africa, urban migration of people, especially of the black population and a deviation from the traditional foods to saturated fatty foods have led to the prevalence of obesity in the South African population (Bourne *et al.*, 2002; MacIntyre *et al.*, 2002).

Socioeconomic status is usually measured in terms of a composite index of income, education, occupation and sometimes place of residence. In a review of 144 studies in 1989 by Sobal and Stunkard, the data showed that socioeconomic status (SES) has an inverse association with obesity in developed countries with people with low SES at higher risk of obesity. This was further supported by Brown & Bentley-Condit (1998), where they reported that socioeconomic status (SES) has an inverse relationship with obesity in developed nations particularly among women but a direct relationship in less developed countries with people with higher SES at higher risk of obesity.

According to different studies in France, UK, and USA, the level of education in these countries is inversely associated with body weight where the prevalence of overweight and obesity is higher among people with a lower educational level (Kuczmarski, 1992, Laurier, Guiguet, Chau, Wells, & Valeron, 1992). This inverse correlation between education and body weight is attributed to the fact that people with high education are likely to follow dietary recommendations and avoid other risk

behaviours than those with low education (Hulshof *et al.*, 1991). This was further supported by a study conducted in South Africa among the four ethnic groups; the data showed that people with a low level of education are at a higher risk of obesity (Senekal, Steyn, & Nel, 2003).

Research has shown that the prevalence of obesity is much higher for Black African and Black Caribbean females than in the general female population but much lower in Black African men (Allenders, Peto, Scarborough, Boxer, & Reynar, 2006). The study by Padget and Biro (2003) on BMI and body dissatisfaction across the ethnic groups reported that African American girls considered themselves to be attractive and sexually acceptable at higher body fat than White girls, while another study found that body dissatisfaction was lower in males (Presnell, Bearman, & Stice, 2004). Evidence suggests that the high prevalence of obesity among Blacks is attributed to African culture and belief where obesity is regarded as an indication of opulence and a negative HIV status (Mvo, Dick, & Steyn, 1999). In many Western and European countries, thinness among women symbolizes competence, success, control, and sexual attractiveness while obesity indicates laziness, self-indulgence and a lack of willpower (Cooper, 1995).

### **2.2.1 Indicators of obesity**

A considerable body of research established that body mass index (BMI) is a universally accepted measure of the degree of overweight and obesity (World Health Organisation, 2003; Malina & Katzmarzyk, 1999). Researchers have demonstrated correlation between BMI and some chronic disease of lifestyle such as diabetes, coronary heart disease, and obesity (Hu *et al.*, 2000).



Illustrated in Table 2.1 is the recent classification of overweight and obesity for adults according to the World Health Organisation (2000).

**Table 2.1 Classification of overweight and obesity in adults by the World Health Organization (2000).**

Classification	BMI (kg/m <sup>2</sup> )	Associated health risks
Underweight	< 18.5	low but risk of other clinical problems.
Normal Range	18.5-24.9	average
Overweight	25.0 or higher	
Preobese	25.0-29.9	increased.
Obese Class I	30.0-34.9	moderately increased
Obese Class II	35.0-39.9	severely increased
Obese Class III	40.0 or higher	very severely increased

A review of the literature indicates that there was a debate to establish a specific BMI cut-off point for both Asian and European populations regarding the interpretations of recommended BMI for overweight and obese people (World Health Organisation, 2004). The review by a WHO expert's consultation indicated that Asian populations have different associations between BMI and percentage of body fat and carry higher health risks than do European populations. However, it was agreed that the World Health Organization BMI cut-off points should be retained as international

classifications (World Health Organisation, 2004). However, children and adolescents have a different measure of body fat because of developmental growth. Cole, Bellizzi, Flegal, and Dietz (2000) highlighted that overweight among children is indicated by a BMI between the 85th and 95th percentiles for age and sex.

Some studies have indicated that with respect to health risks associated with overweight and obesity, waist-hip ratio (WHR) and waist circumference are found to be more appropriate and effective indicators for abdominal fat distribution than body mass index (BMI) which either under estimates or over estimates weight and height (Kuk, Katzmarzyk, Nichaman, Church, Blair, & Ross, 2006; Kragelund & Omland, 2005; Dalton *et al.*, 2003; Booth, Hunter, Gore, Baunman, & Owen, 2000). This was further supported by Yusuf *et al.* (2005) that individuals with a higher WHR are at higher risks of developing chronic diseases of lifestyles such as coronary heart disease, hypertension, dyslipidemia, and type 2 diabetes.

### **2.2.2 Prevalence of overweight and obesity**

A review of the literature provides evidence that the current proportion of overweight and obese people are approximately 1.6 billion and 400 million adults aged 15 years or older respectively (World Health Organisation, 2006). A study conducted in the United States by Ogden *et al.* (2006) indicated that in 2003-2004, approximately 32.2% of American adults were obese with a prevalence of 45% for non-Hispanic Black, 36.8% for Mexican American, and 30% for non-Hispanic White. Similarly, the data indicated a higher prevalence of overweight and obesity in the African-American population compared to their White counterparts (Must, Gortmaker, & Dietz, 1994; Kuczmarski, Flegal, Campbell, & Johnson, 1994). A study in Australia by Cameron *et al.* (2003) also indicated that the prevalence of overweight and obesity was

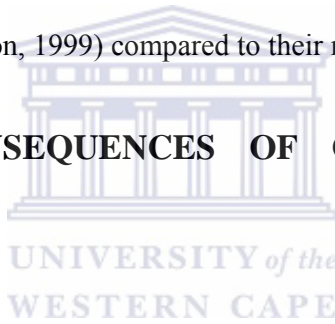
approximately 39% and 21% respectively. Thorburn (2005) further demonstrated that approximately 67% of men and 52% of women in Australia are overweight and obese. Literature on the prevalence of overweight and obesity in England show that approximately 44% of men and 35% of women are overweight and 23% of men and 24% of women are obese (Allenders *et al.*, 2006).

In South Africa, a study by Pouane *et al.* (2002) estimated that the prevalence of overweight and obesity was approximately 30% in men, and 56% in women. The study further showed that black women had the highest prevalence of overweight and obesity (58.5%), followed by women of mixed ancestry (52%), white women (49.2%) and Indian women (48.9%). However, evidence suggest that a different pattern was seen in men, with a prevalence of 54.5% for White men, 32.7% for Indian men, 31% for men of mixed ancestry, and 25% for African men (Pouane *et al.*, 2002).

Literature has shown that the prevalence of overweight and obesity is not limited to the adult population, but also affects younger people. Data from one study indicated that childhood obesity is increasing at an alarming rate worldwide, with approximately 22 million children under the age of 5 being classified as overweight (Rocchini, 2002). In a study done in the United States between the periods of 2003 to 2004, the prevalence of overweight in children and adolescents was approximately 17.1% (Ogden *et al.*, 2006). This was further emphasized by the National Centre for Health Statistics (2002), that 16% of American Children between the age of 6 and 11 were overweight with a BMI  $\geq$  95th percentile. Similarly, studies have shown that the prevalence of childhood obesity is higher in African-American than their White peers (Freedman, Kettel-Khan, Srinivasan, & Berenson, 2000; Rosner, Prineas, Loggie, & Daniels, 1998).

A similar picture is observed in South Africa. According to a study among children living in cosmopolitan cities in South Africa, the prevalence of overweight was approximately 17% (Steyn, Labadarios, Mauder, Nel, & Lombard, 2005). Data from this study further indicated that 6.7% and 3.7% of 1-9 year old children were overweight and obese respectively. Another study conducted in South Africa further showed that the prevalence of obesity was approximately 2.4 % in boys and 4.8%, in girls and about 10.9% boys, and 17.5% girls were overweight (Armstrong, Lambert, Sharwood, & Lambert, 2006). This increasing prevalence of overweight and obesity among children is of concern as they are equally at higher risk of asthma (Gilliland *et al.*, 2003); type 2 diabetes (Sinha *et al.*, 2002) and cardiovascular disease (Freedman, Dietz, Srinivasan, & Berenson, 1999) compared to their non-obese peers.

### **2.3 HEALTH CONSEQUENCES OF OVERWEIGHT AND OBESITY**



Evidence exists that overweight and obesity are the major risk factors for some life debilitating conditions such as premature mortality, coronary heart disease, stroke, type 2 diabetes mellitus, hypertension, and some cancers (Royal College of Physicians, Royal College of Paediatrics and Child Health and Faculty of Public Health, 2004). Similarly, overweight and obesity are also linked to other problems such as arthritis, gout, and gallstones (Kopelman, 2001).

A considerable body of research has shown that mortality is strongly associated with obesity. A study done in the United States showed that between 280 000 and 325 000 of annual deaths is attributed to overweight and obesity (Allison, Fontaine, Manson, Stevens, & VanItallie, 1999). In a study of Stevens, Cai, Pamuk, Williamson, Thun, and Wood (1998), the data from the American Cancer Society's Prevention Study I

showed that in a study among 62116 men and 262019 women with a 14-year follow up, a higher BMI was associated with increased death rate in both groups. This was further supported by Jousilahti, Tuomilehto, Vartiainen, Pekkanen, & Puska (1996) in their study, the data showed that for a 1kg increase in body weight, the risk of cardiovascular mortality increased by 1% to 1.5%.

### **2.3.1 Cardiovascular disease**

Cardiovascular disease (CVD) is one of the top causes of deaths in the United States (American Heart Association, 2003). Furthermore, there is evidence that an association exists between obesity and cardiovascular disease (Berenson, Srinivasan, Bao, Newman, Tracy, & Wattigney, 1998). This was further supported by Hu *et al.*, (2000), in their study that people with higher BMI are at a higher risk of cardiovascular disease. A study conducted in the United States further indicated that the risk of developing coronary heart disease (CHD) also increases with increased BMI. For instance, CHD increases 3.3 times when BMI was greater than 29 (Manson *et al.*, 1995). In a study by Willet, Dietz, & Colditz (1999), evidence showed that the relative risk of developing coronary heart disease (CHD) was positively correlated with obesity and was 2.8 in men and 3.4 in women. In addition, studies have indicated that the risk of developing CHD was higher in people with central obesity than those with excess fat around the hips and thighs (Han, van Leer, Seidell, & Lean, 1995). Moreover, Cooper *et al.* (2000) in their study indicated higher prevalence of hypertension, dyslipidemia, and coronary heart disease in Blacks compared to their White counterparts. Conversely, in a meta-analysis of study by Rosner *et al.* (1998), it showed that regardless of socio-demographic characteristics, children with higher BMI are at higher risk of hypertension.

### **2.3.2 Diabetes**

A study in the United States by the American Diabetes Associations (2008) showed that approximately 23.6 million Americans are diabetic. Studies have shown that the type 2 diabetes mellitus which is indicated in people with higher body fat is rapidly increasing among the adolescents (Fagot-Campagna, 2000; McClain, Srinivasan, Chein, Steinmann, & Berenson, 2000). Evidence suggests that the earlier the onset of diabetes, the higher the incidence of nephropathy, retinopathy, neuropathy, and coronary vascular disease (Daniels, 2001). A study by Chan, Rimm, Colditz, Stampfer, & Willet (1994) reported that the relative risk for diabetes in men with a BMI of 35 kg/m<sup>2</sup> was 40 times greater than in men with a BMI of 23 kg/m<sup>2</sup>. This was further supported by Colditz, Willet, Rotnitzky, & Manson (1995) who reported a similar association in women. The study indicated that obese women with a BMI of greater than 30 had a 28 times higher risk of diabetes and the risk increases further as weight increases. Another study found that among the people who were able to lose weight, mortality associated with diabetes was reduced by 25% (Williamson, Thompson, Thun, Flanders, Pamuk, & Byers, 2000).

### **2.3.3. Cancer**

In a study done in the United states, evidence has shown that obesity is the second leading cause of preventable deaths (Allison *et al.*, 1999) and a larger percentage of these deaths is due to cancer (Calle, Rodriguez, Walker-Thurmond, & Thun, 2003). Some studies have shown that obesity is negatively associated with an increased risk of some forms of cancers (Manson *et al.*, 1995). However, evidence suggests that in women obesity is associated with cancers of the reproductive system while in men obesity is associated with cancer of the rectum, colon, and prostate (Bray, 2004). One

study found that a BMI of greater than 21 kg/m<sup>2</sup> is attributable to 8-42 % of breast, colon and other forms of cancer (Popkin, 2007; Calle & Kaaks, 2004). Furthermore, the association between obesity and cancer has been extensively studied by the American Institute for Cancer Research and World Cancer Research Fund (WCRF) with incidence of some cancers associated with body size (WCRF, 1997). Data from the study indicated that people with a BMI greater than 27 kg/m<sup>2</sup> are at higher risk of developing breast and kidney cancer and those with a BMI greater than 30 kg/m<sup>2</sup> are at higher risk of endometrial cancer, than those with normal weight. Similarly, Huang *et al.* (1999) on Nurses' Health Study follow up of menopausal women, their study showed a direct relationship between the breast cancer and large waist circumference that is the higher the waist circumference, the higher the risk of developing breast cancer in women.

#### **2.3.4. Osteoarthritis**

Osteoarthritis is a common degenerative disease of joints. Evidence increasingly suggests that the incidence of osteoarthritis is significantly increased in obese people (Bray, 2004). Similarly, a study found that obesity is the major preventable risk factor for osteoarthritis of the knee and ankle (Hart & Spector, 1993). In the same study, data showed that the risk of knee osteoarthritis increased by 35 % for every 5kg of weight gained. Data from the Framingham study in the United States demonstrated that weight control significantly reduced the risk of osteoarthritis (Felson, Zhang, Anthony, Naimark, & Anderson, 1992).

## **2.4 FACTORS INFLUENCING EFFECTIVE MANAGEMENT OF OBESITY**

Research has shown that despite the high level of awareness of causes and consequences of obesity among the health care professionals, there to be challenges on how best to manage and advise obese patients as interventions seem not to be effective (Stafford, Farhat, Misra, & Schoenfeld, 2000). A considerable body of research shows that many health professionals for instance physicians accepted they have roles to play in the area of obesity prevention and management (Campbell, Engel, Timperio, Cooper, & Crawford, 2000). On the contrary only few appear to be well informed to effectively support and counsel obese patients (Foster *et al.*, 2003). This was further corroborated by a study in France, which showed that only a minority of the physicians believed they are capable of counseling obese people even though such advice does not appear to help obese patients (Thuan & Avignon, 2005). Some studies have attributed this to deficiency of training programmes of health care practitioners in nutrition and obesity-related knowledge (Block *et al.*, 2003; Moore *et al.*, 2000). Moreover, obesity is not a common subject in the pre-qualification training of health care professionals and opportunities for further training are limited (Campbell & Welborn, 1994). Similarly, Fogelman, Vinker, Latcher, Biderman, Itzhak, and Kitai (2002) identified poor medical training programmes in nutrition, exercise, and behavioural counseling. Hash *et al.*, (2003) further highlighted the barrier to a belief that obesity is under personal control, and this is seen to contribute to negative attitudes among health care providers. Billington (2000) and Campbell *et al.* (2000) concluded that this is due to inability on the part of practitioners to identify an effective treatment.



### **2.3.3. Knowledge**

Two decades ago, studies have shown that health care professionals had incomplete and incorrect knowledge of the causes of obesity and nutrition (Francis, Roche, Mant, Jones, & Fullard, 1989; Haines & Sanders, 1989). More recently, Stafford *et al.* (2000) demonstrated that healthcare professionals often fail to either recognize or treat obesity and this was attributed to lack of knowledge about the health risks of obese people. Hankey, Eley, Leslin, Hunter, and Lean (2004) further stated that registered nurses believed they lack the requisite skills to provide weight management advice. Similarly, in a study by Bocquier *et al.* (2005), the data showed that 50 % of the physicians were not aware of risks of infertility and some cancers for obese individuals and as such often fail to advise patients appropriately. Teachman and Brownell (2001), indicated that the more knowledgeable and experienced healthcare professionals are, the lower the bias towards obese people. Conversely, Fogelman *et al.* (2002) and Campbell *et al.* (2000) found in their studies that general practitioners (GPs) were aware of obesity being a risk factor for some life-threatening medical problems but such knowledge will not necessarily improve the attitudes towards obese people. This was further supported by Kupper, Krause, Glaesmer, and Wittchen (2004) that awareness of health risks of obesity is not enough to modify behaviours.

### **2.4.2 Beliefs**

Harvey and Hill (2001) indicated that healthcare professionals in the United Kingdom rated behavioural factors i.e. diet and physical activity as constituting the important risks of obesity than genetic factors. Foster *et al.* (2003) corroborated this in their study where physical inactivity was rated as the most important cause of obesity. Schwartz, Chambliss, Brownell, Blair, and Billington (2003) opined that healthcare

professionals who understands the causes and consequences of obesity as poor dietary pattern and sedentary lifestyle believe that individuals are personally responsible for their weight.

Now, it is increasingly evident that causes of obesity and its controls are beyond the individual (Rosmond, 2004; Chambers & Wakley, 2002). Newell, Zlot, Silvey, and Ariail (2007) concluded that with the complex nature of obesity aetiology, one-way approach may be ineffective in preventing or treating obesity as other causes other than behavioural factors have to be taken into consideration. Recently the conference on 'The World Health Organisation-European Charter for Counteracting Obesity' made it clear that fighting against the obesity epidemic requires vigorous social, physical, economical and political approaches and that individuals cannot be held responsible for their weight (Booth, Pinkston, & Poston, 2005; Robinson & Sirard, 2005; Seidell, Nooyens, & Visscher, 2005). Kristeller and Hoerr (1997) observed that healthcare professionals play an important role in obesity intervention and the degree of such a role depends to a large extent on their ability to recognize the causes and consequences of obesity. In the same vein, Chambliss *et al.* (2004) emphasized that negative attitudes among the healthcare professionals are attributed to their belief that greater control of obesity rests with the individual and such belief reduces the effectiveness of lifestyle counseling and other intervention programmes.

Evidence to support the influence of demographic characteristics on belief factors was limited. The study of Covic, Roufeil, and Dziurawiec (2007) found no significant difference between belief factors and level of education. These authors found a relationship between gender and causes of obesity with females strongly endorsing

that obesity is under the personal control. This was supported by Hardus, van Vuuren, Crawford, and Worseley (2003) who reported similar gender associations.

### **2.4.3 Attitude**

Studies have shown consistently that overweight and obese people face discrimination in employment, education, and health care because of their weight (Puhl & Brownell, 2006). According to a study conducted in the United States, findings showed that the prevalence of weight discrimination was 7% in 1995-96 and 12% in 2004-2006 (Andreyeva, Puhl, & Brownell, 2008).

According to Puhl and Brownell (2003), the reasons for negative attitudes towards people who are obese are not clearly understood, but it is strongly attributable to preference for thinner body by some cultures. The study by Padgett and Biro (2003) indicated that African-Americans considered themselves to be more attractive at a higher body weight than their White counterparts. Similarly, other studies conducted in the United States, showed that Black women are less likely to hold negative attitudes than their White counterparts and have greater acceptance for obese people (Latner, Stunkard, & Wilson, 2005; Perez-Lopez, Lewis, & Cash, 2001; Straus, 2000). The lower degree of negative attitudes observed in Blacks is attributed to a higher prevalence of obesity in the Black population (Hedley, Ogden, Johnson, Carroll, Curtin, & Flegal, 2004). The higher acceptance by Black population was attributed to some beliefs in African culture that large body signifies wealth and negative HIV/AIDS status (Mvo *et al.*, 1999).

Attitudes towards obese individuals are reinforced by gender. Study has shown that women are more concerned about their weight and they do endorse more negative attitudes towards people who are obese than their male counterparts (Latner *et al.*, 2005). Schwartz *et al.* (2003) further established that men were more receptive towards obese people than women. On the contrary, evidence from other studies showed that men hold more negative attitudes towards obesity than do women (Perez-Lopez *et al.*, 2001; Lewis, Cash, Jacobi, & Bubb-Lewis, 1997). Another study done in Canada corroborates that women have more positive attitude towards obese individuals (Glenn & Chow, 2002).

Berryman *et al.* (2006) indicated that underweight, normal and overweight students possessed the same level of negative attitudes towards obese people. This was further highlighted by Chambliss *et al.* (2004) and Wang, Brownell, and Wadden (2004) that own body mass index have no influence on the attitudes towards obesity. McArthur and Ross (1997) further supported this as they found no significant association between own BMI and attitudes to obese clients among dietitians who perceived themselves as overweight. In contrast, data from Oberrieder *et al.* (1995) indicated that people with a lower BMI endorsed more negative attitudes towards obese people.

Research has shown that, like the general public, healthcare professionals are also not immune to this negative attitude (Berryman *et al.*, 2006; Chambliss *et al.*, 2004; Puhl and Brownell, 2001, 2003). Furthermore, the basis of negative attitude towards overweight and obese people is believed to stem from the preference for thinner body shape by the general public and media (Puhl & Brownell, 2001, 2003). Puhl and Brownell (2001) emphasized that this negative attitude is not only directed to obesity as a medical problem but also towards obese individuals themselves. These authors

further stated that, this attitude they observed is mediated by the belief that obesity is under the personal control and attributed to them being lazy and lacking self control. The consequences of such negative attitudes are reported in several studies. One study reported that healthcare professionals who understand obesity and its medical conditions still characterized personal traits such as laziness as contributing factors to obesity (Schwartz *et al.*, 2003). Loomis *et al.* (2001) found that family physicians labelled obese patients as lacking self-control. This was further supported by another study done in France, that 30 % of the physicians considered obese patients to be lazier and more self-indulgent than their counterpart non-obese individuals (Bocquier *et al.*, 2005).

The negative attitudes towards obese people are not only endorsed by physicians, but other healthcare professionals have also been reported to hold the same view. A study that explored the attitudes towards obesity among dietitians showed that they characterized obese patients as lacking self control, lacking motivation and lazy (Oberrieder *et al.*, 1995). There is also evidence that registered nurses labelled obese patients as lazy, over-indulgent and less competent than non-obese mates (Cramer & Steinwert, 1998; Maroney & Golub, 1992). Furthermore, evidence showed that the majority of medical students viewed obese individuals to be less attractive and less compliant (Wigton & McGaghie, 2001). According to Puhl and Brownell (2003), the widespread negative attitude against obese people by healthcare professionals increases the tendency of obesity-related behaviours (poor eating and sedentary lifestyle). This was further supported by Hebl and Xu (2001) who noted that negative attitudes towards obese patients will likely result in differential treatment as regards to equal access to facilities and professionals-patient interactions. For instance, Hebl and Xu (2001) found that physicians reported that they would spend less time with obese

patients and engage in less discussion by ordering more tests. Another study observed that negative attitudes towards obese people would likely result in underutilization and avoidance of preventive healthcare services among the obese women as they are less likely go for mammogram and gynaecological screening compared to non-obese women (Drury & Louis, 2002). Furthermore, in a study conducted among the physicians, approximately 17 % indicated they were less likely to perform pelvic examinations on overweight or obese women (Adams, Smith, Wilbur, & Grady, 1993). This differential treatment according to Maroney and Golub (1992) reported that about 35 to 48% of nurses indicated they felt uncomfortable taking care of obese patients, 24% of nurses agreed they were repulsed by obese patients.

## **2.5 ROLE OF PHYSIOTHERAPISTS IN THE MANAGEMENT OF OBESITY.**

One of the principles of Ottawa charter on health promotion conference held in 1986 advocated for re-orientation of health services from clinical and curative services to a health promotional approach that include preventive services (World Health Organization, 1986). The role of health care professionals, which include physiotherapists, is seen beyond individual professional-client partnership to public health prevention directed at everyone in a community (Higgs, Refshauge & Ellis, 2001). However, the debate is still on about the complex diverse factors involved in the aetiology of obesity, but it is now clear that individuals may be overwhelmed by genetic and other biological factors rather than predominantly behavioural factors (World Health Organization, 2000). Although, dietary factors and physical activity are considered to be the major modifiable factors for obesity, it is equally important to

recognize the powerful biological, societal and environmental factors underlying weight gain (World Health organization, 2000).

Physiotherapists have specific education in biomechanics, therapeutic exercise and exercise prescription, and physiological and anatomical mechanism of health and disease. These skills position physiotherapists to intervene in the management of obese individuals and associated conditions (Canadian Physiotherapy Association, 2008). As primary health care professionals, physiotherapists are ideally suited to identify exercise strategies in the prevention and treatment of obesity and associated conditions within a multidisciplinary rehabilitation team (Canadian Physiotherapy Association, 2008). However, the evidence supporting the effectiveness and efficacy of exercise to achieve weight loss is not satisfactory (Douketis, Macie, Thabane, & Williamson, 2005; McTigue, Harris, Hemphill, Lux, Sutton, & Bunton, 2003; Proper, Hildebrandt, van Der Beek, Twisk, & van Mechelen, 2003; Foreyt, Brunner, Goodrich, St Jeor, & Miller, 1995; Williamson, Madans, Anda, Kleinman, Khan, & Byers, 1993). Nevertheless, evidence that exercise combined with diet has a positive effect on cardiovascular risk factors such as reduced systolic and diastolic blood pressure, cholesterol, triglycerides and fasting serum glucose (Eiben & Lissner, 2006; Shaw, Gennat, O'Rourke, & Del Mar, 2006; Simkin-Silverman, Wing, Boraz, Kuller, 2003).

Obese individuals experience a wide range of functional limitations including muscle weakness, joint pain, back pain, urinary stress incontinence, walking, climbing stairs, among others (Peltonen, Lindroos, & Torgerson, 2003; Barofsky, Fontaine, & Cheskin, 1997). The skills of physiotherapists position them to individualize exercise regimes within the limit of functional limitations experienced by obese clients to help

increase muscle strength, flexibility and endurance with graded mobilization and progressive rehabilitation programmes (Canadian Physiotherapy Association, 2008).

Through individualized exercise regimes, physiotherapists also play a major role in the management of secondary conditions associated with obesity in obese clients such as osteoarthritis, low back pain and those with joint replacement with the main goal of maintaining weight loss (Canadian Physiotherapy Association, 2008).

As health promoters, physiotherapists not only counsel and advise obese individuals in the promotion of healthy lifestyles but also educate other members of the community on the health risks associated with obesity. With the complex aetiology of obesity, physiotherapists and other members of rehabilitation team should work in a multidisciplinary team in the prevention and management of obese individuals.

## **2.6 SUMMARY**

The literature reviewed highlighted the increasing prevalence of obesity in both developed and developing countries. Knowledge of obesity and attitudes towards obese individuals by health care professionals were further highlighted. The lack of literature regarding studies pertaining to the knowledge, beliefs, and attitudes of physiotherapy students specifically was clear. The study will thus attempt to determine the knowledge of and attitudes to obesity among students of physiotherapy.

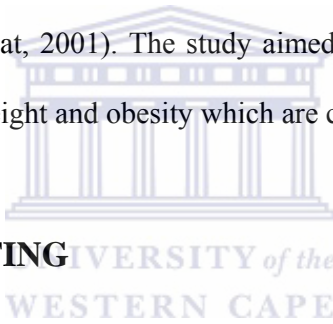


## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 INTRODUCTION**

This chapter describes the research setting in which the study was based. The study design, study population, sampling method and instrument used to collect data are also described together with the validity and reliability of the instrument. As a point of departure, the ethical considerations regarding the study are also discussed. According to Alston and Bowles (2003), belief is in the ideology where reality can be measured objectively, and knowledge is based on observation and measurement that is systematically applied (Seedat, 2001). The study aimed at describing knowledge of, and attitudes towards overweight and obesity which are concepts of abstract nature.



#### **3.2 RESEARCH SETTING**

The study was conducted at the University of the Western Cape (UWC). UWC is located in the northern suburbs of Cape Town, a cosmopolitan city in the Western Cape Province, South Africa. The University is readily accessible by car, taxi, bus or train and even has its own railway station, Unibell, on the southern boundary of the campus. The University of the Western Cape has a rich history of creative struggle against apartheid and oppression and extensive practical engagement in helping the historically marginalized group to fully participate in the intellectual, social, and economic life of the nation. It has been in the fore front of South Africa's history change, playing a unique role in disseminating knowledge that is dynamic and relevant to the challenges of a modern world and a transforming society.

There are seven (7) faculties at the UWC. These include Arts, Community and Health Sciences, Dentistry, Economic and Management Sciences, Education, Law, and Natural Sciences. Both undergraduate and postgraduate students are enrolled in those faculties. For the 2008 academic year an estimated 15,000 students were enrolled at UWC (UWC Prospectus, 2007-2008).

### **3.3 RESEARCH DESIGN**

To address the research problem the study utilized a quantitative research method employing a descriptive cross-sectional research analysis. According to Polit, Beck and Hungler (2001) “cross-sectional designs are especially appropriate for describing the status of phenomena or relationships among phenomena at a fixed point”. The main approach technique developed in social psychology to study attitudes is by using a questionnaire (Oppenheim, 2000). The cross-sectional design was deemed appropriate for this study as the knowledge and attitudes of students were examined at a specific point in time.

### **3.4 STUDY POPULATION AND SAMPLE**

The Community and Health Sciences (CHS) Faculty of UWC consists of ten (10) departments of which the Physiotherapy department is one. According to the student profile of 2008, the physiotherapy department had 220 (full time) students enrolled during 2008 academic session. Of the total numbers of students, 79.5% were undergraduates and 20.5% postgraduate students, 75% were females and 25% were males.

The population for this study included all current (2008) full-time, undergraduates and postgraduate students. A convenience sampling was specifically used for this study in tune with what was used in previous studies to assess attitudes of exercise Science students (Chambliss *et al.*, 2004), dietetics students (Berryman *et al.*, 2006) and nutrition students (McArthur, 1995) respectively. All physiotherapy students willing to participate were included in the study. A total number of one hundred and seventy five (175) students completed and returned the questionnaire. Five questionnaires were invalid because more than 50% of the items were left unfilled so could not be used for analysis. The overall response rate was thus 77.3%.

### **3.5 METHODS OF DATA COLLECTION**

Data was collected by means of a structured, self administered questionnaire including items measuring attitudes towards and knowledge of obesity. Below follows a brief motivation for the choice of instruments and its properties.

#### **3.5.1 Research instruments**

The instrument used was a self-administered questionnaire with closed-ended questions (Appendix E). The questionnaire was divided into two sections. The first section of the questionnaire measured socio-demographic characteristics of the study participants. The following variables were assessed; age, gender, year of study, height and weight, any formal training received regarding management of obese individuals, where the training was received and finally perceived responsibility in the management and counseling for obese individuals.

The second section of the questionnaire consisted of three scales that measured beliefs about the causes of obesity and notion of personal control of obesity, knowledge of health risks associated with obesity and finally attitudes towards obese individuals.

An adopted Fat Phobia Scale (FPS) designed by Bacon, Scheltema, and Robinson (2001) was used to determine students' attitudes towards obesity. Participants were requested to complete the 14-item validated FPS. Items were rated using a 5-point Likert scale ranging from 1 to 5 with some items reverse scored so that higher scores reflect greater bias towards obese people. Based on the score design, a score of 2.5 indicates neutral attitudes about obese individuals. A score of more or less than 2.5 indicates a more negative or positive attitudes respectively.

The Belief About Obese Person scale (BAOP) including eight items, designed by Allison, Basile and Yucker (1991) was used to assess the beliefs about the causes of obesity. Participants were requested to complete the eight-item validated BAOP on a 4-point Likert rating scale ranging from strongly disagree to strongly agree. Higher numbers indicate a stronger belief that obesity is *not* under the obese person's control.

The third scale, the Obesity Risk Knowledge (ORK-10) scale designed and validated by Swift, Glazebrook, and Macdonald (2006) was used to measure participant's knowledge of the health risks associated with obesity. The scale is designed to be self-completed with participants being required to judge whether statements are 'True' or 'False'. Scores on the ORK-10 scale range between 0 and 10 with higher scores indicating higher levels of knowledge.

### 3.5.2 Validity and reliability

Validity and reliability are the two most important criteria by which a quantitative instrument's adequacy is evaluated (Polit *et al.*, 2001). Validity refers to the extent to which an instrument measures what it is supposed to be measuring. Reliability is the degree of consistency with which it measures the attributes it is supposed to measure (Bless & Higson-Smith, 2000). All the scales included in the research instruments have been used in prior research and demonstrated good reliability. The Fat Phobia Scale which measures attitudes towards obesity developed by Bacon *et al.* (2001) demonstrated excellent reliability (Cronbach's  $\alpha=0.91$ ). The BAOP scale which measures the beliefs about the causes of obesity developed by Allison *et al.* (1991) has  $\alpha$  reliability of 0.63-0.82. The ORK-10 scale has good internal consistency (Cronbach's  $\alpha = 0.7$ ) and has proved to be a reliable measure of knowledge regarding health risks associated with obesity (Swift *et al.*, 2006).

Unlike reliability, validity of an instrument is extremely difficult to establish. To ensure validity of the instrument, the scales were adopted from previous studies with established and standardized questionnaires.

A pilot study was carried out prior to the study. The piloting was conducted among five postgraduate students of the department of physiotherapy whose results were not included in the final study. This was done to ascertain clarity, understanding of the questionnaire and the amount of time needed to complete the questionnaire. It was indicated that the questionnaire was clear and understood by the students and it took 15-20 minutes for students to complete the questionnaire. A discussion followed the completion of the questionnaire. The results indicated that the instrument was relevant to the population and was easily used by the students.

### **3.5.3 Procedure**

Permission and ethical clearance was granted from the UWC Senate Research Grant and Study Leave Committee to conduct the study (Appendix A). Furthermore, permission was sought from the Registrar of the University of Western Cape and the HOD, of the Physiotherapy department (Appendix B).

The questionnaires were administered to participants in a class setting. At the beginning of each session the purpose of the study was clearly explained by the researcher to the participants. Signed, written consent (Appendices C and D, respectively)) was required from each participant. Detailed instructions on how to complete the questionnaire followed. All this information was also available on the front page of the questionnaire. This procedure was done towards the end of each class period to maximize the participation rate. The students were asked to work individually, honestly and as quickly as possible and collection was done after 20 minutes allocated for completion of the questionnaire. The questionnaires were administered during the first semester of 2008.

### **3.5.4 Data Analysis**

Completed data was captured on a spreadsheet using the Microsoft Excel programme in preparation for analysis. The data were coded and relevant sections were scored from question responses. Double data entering was done to ensure data quality. The data was then transferred into the Statistical package for Social Sciences (SPSS) version 16.0.

Descriptive statistics were employed to summarize the demographic data of the study sample. The demographic data were presented using frequency tables and was expressed as percentages, means, and standard deviations.

Cross tabulations were used to determine the distributions of cases or frequency counts in the various groups defined in the objectives. The differences between socio-demographic factors specific variables (knowledge, beliefs about causes of obesity, and attitudes towards obese individuals) were tested using the t-test, ANOVA and Chi-square. The correlation co-efficient was used to test the strength of the relationship between knowledge and attitudes. Alpha level was set at  $p < 0.05$ .

### **3.5.5 Ethical Considerations**

Following approval of the research proposal by the Senate Research Grant and Study Leave Committee of the University of the Western Cape, further permission was requested from the HOD Physiotherapy and Registrar University of the Western Cape. Students were reminded that their participation in the study was voluntary and that they retained the right to withdraw at any time without any consequences. Participants were assured of strict confidentiality of information provided, and informed about the ways in which the results will be made available to the physiotherapy department. Anonymity was achieved by having students complete questionnaires without their names or identifying information on the questionnaire. Students were assured that there are no known risks associated with participating in the study.

### **3.5.6 Summary**

In this chapter, the research setting, study population, study design and sampling procedure are described. Furthermore relevant methodological issues such as methods of data collection, reliability and the validity of the study and a brief outline of the analysis of the data were outlined. The results of this analysis were tabulated and are presented in Chapter 4.





## **CHAPTER FOUR**

### **RESULTS**

#### **4.1 INTRODUCTION**

This chapter describes the results of the statistical analysis that attempted to answer the research objectives stated in chapter one. Firstly the socio-demographic characteristics of the study sample are described, followed by the knowledge of the study sample regarding health risks associated with obesity and beliefs about the causes of obesity among the participants. Finally the attitudes of the participants towards obese individuals are described.

#### **4.2 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS**

One hundred and seventy five (175) participants completed and returned the questionnaires. Five questionnaires were invalid because more than half of the items were left unfilled. The overall response rate was thus 77.3%. The final sample consisted of 73.5 % (n=125) females and 26.5% (n=45) males as illustrated in table 4.1. The participants' ages ranged from 17-49 years with a mean age of 21.54 years (S.D=4.903). The majority of the participant (67.6 %; n=115) indicated their father as the head of the household and the majority's (61.5%; n= 104) head of household's educational level was at tertiary level. The BMI of the participants ranged from 14.02 kgm<sup>-2</sup> to 39.38 kgm<sup>-2</sup> with a mean of 22.76 (SD = 4.35).

**Table 4.1 Distribution of selected socio-demographic characteristics of the study sample (n= 170)**

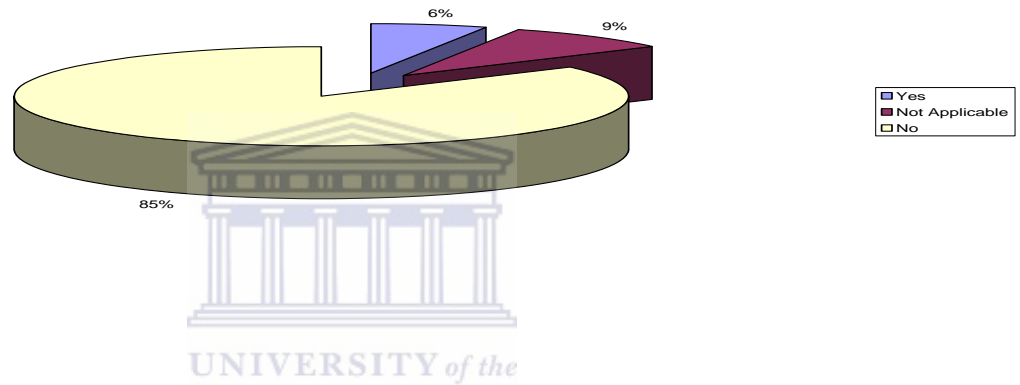
<b>Demographic variables</b>	<b>Characteristics</b>	<b>Frequency (n)</b>	<b>(%)</b>
<b>Gender</b>	Female	125	73.5
	Male	45	26.5
<b>Age (Years)</b>	<20	97	57.1
	21-30	59	34.7
	31-40	12	7.1
	>40	2	1.2
<b>Year of study</b>	1	41	24.1
	2	31	18.2
	3	41	24.1
	4	40	23.5
	Post graduate	17	10
<b>Ethnicity</b>	Coloured	91	53.5
	White	30	17.6
	Black	27	15.9
	Others*	21	12.4
<b>BMI</b>	<18.5	22	14.1
	Normal	95	55.9
	Overweight	30	17.6
	Obese	9	5.3
<b>Head of Household</b>	Father	115	67.6
	Mother	40	23.5
	Others**	13	7.6
<b>Education level of head of household</b>	Primary	6	3.7
	Secondary	54	32.9
	Tertiary	104	61.2

\* Include: Indian and Malay

\*\* Include: Self, Husband, Uncle.

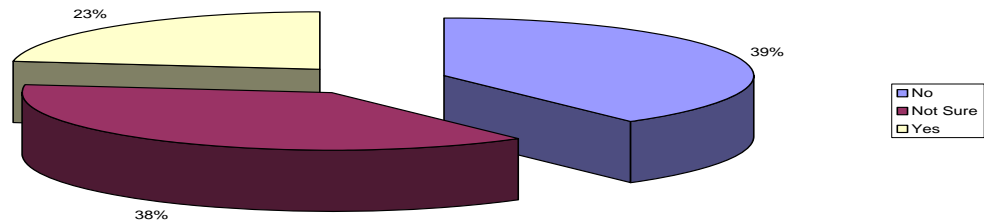
#### 4.2.1 Obesity Education

Figure 4.1 summarizes the percentage of students who received education regarding obesity among the study sample. The majority (85 %) of the study participants reported they did not receive education pertaining to obesity; while 9 % of the study participants were not sure if obesity education is applicable to them. Approximately 6% reported to have received formal education regarding obesity.



**Figure 4.1** Percentage of students who reported receiving formal education regarding obesity (n = 170).

Figure 4.2 indicates that the majority of the participants felt they were not well informed to address the issues of obesity. Nearly 40% of the participants felt that they were not well informed to give advice to obese people and 38% were not sure. Only 23% of the participants reported they could give advice as illustrated in Figure 4.2



**Figure 4.2 Percentage of study sample well informed to give advice regarding obesity (n =170).**

#### **4.3 KNOWLEDGE OF STUDY SAMPLE REGARDING HEALTH RISKS ASSOCIATED WITH OBESITY.**

Table 4.2 illustrates responses to the general knowledge questions (ORK-10) concerning health risks associated with obesity. Participants could select ‘True’ or ‘False’ for the different statements. The majority of the participants (96.5%) knew that obesity is a risk factor for hypertension. Furthermore, 89% of the participants agreed that there is a health benefit for obese individual to lose weight and 67.1% of the participants underestimated the risk of breast cancer after menopause in obese individuals.

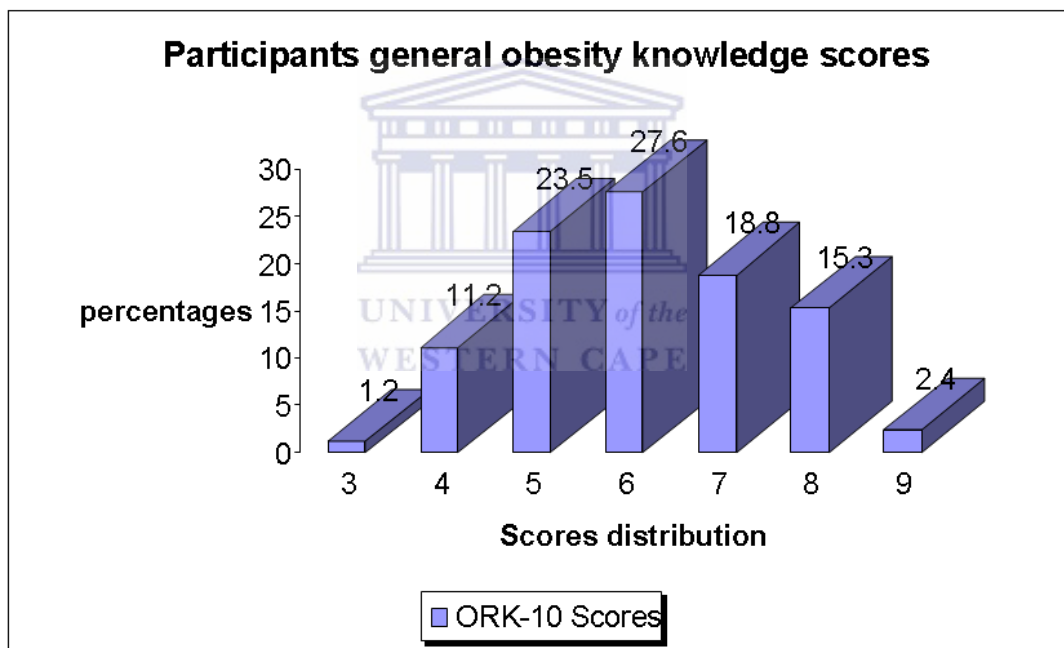
**Table 4.2 Knowledge of health risks associated with obesity of study sample (n=170).**

Questions	Correct (%)	Incorrect (%)
Obesity does not increase the risk of developing high blood pressure (False)	96.5	3.5
Obese people can expect to live as long as non-obese People (False)	90.0	10.0
There is no health benefit if an obese person who gets diabetes, loses weight (False)	89.4	10.6
Obesity increases the risk of getting food allergy (False)	77.2	22.8
Obesity increases the risk of getting bowel cancer (True)	65.9	34.1
A person with a 'beer belly' shaped stomach has an increased risk of getting diabetes (True)	65.7	34.3
It is better for a person's health to have fat around the hips and thighs than around the stomach & waist (True)	54.7	45.3
Obesity increases the risk of getting breast cancer after the menopause (True)	32.9	67.1
An obese person who gets diabetes needs to lose at least 40% of their body weight for clear health benefits (False)	24.3	75.7
Obesity is more of a risk to health for people from South-Asia (e.g. India) than it is for White Europeans (True)	14.1	85.9

All responses expressed as percentages.

The ORK-10 is 'norm-referenced' as opposed to 'criterion referenced'. There is no cut-off point to say knowledge is high or low. However higher scores indicate higher levels of knowledge regarding the health risks associated with obesity.

Figure 4.3 summarizes the scores of the participants on the ORK-10. The scores of the participants ranged from 3 to 9 (mean score = 6.08; SD = 1.35). The majority of the participants (87.6%) achieved scores of 5 and more on the scale of 10 and 12.4% of the participants achieved scores of less than 5.



**Figure 4.3 Study participants' knowledge of the health risks associated with obesity (n = 170).**

#### **4.4 ASSOCIATIONS BETWEEN DEMOGRAPHIC VARIABLES AND KNOWLEDGE OF HEALTH RISKS OF OBESITY.**

##### **4.4.1 Gender**

Table 4.3 illustrates the participants' knowledge of health risks associated with obesity by gender. The association between knowledge items and the gender was very low and not statistically significantly ( $\chi^2=0.78$ ,  $p< 0.05$ ).

Very few individual knowledge questions had significant associations with gender. There was a significant difference between males and females with regards to the notion that obese people can expect to live as long as non-obese person ( $\chi^2 =10.16$ ,  $p< 0.05$ ) with females less likely to endorse this.

##### **4.4.2 Year of study**

Table 4.4 illustrates the knowledge the participants in the different year of study group had about health risks associated with obesity. The association between knowledge items and the year of study was very low and not statistically significantly ( $\chi^2 =1.07$ ,  $p< 0.05$ ). Very few individual knowledge questions had significant associations with the year of study. There was a significant association between the year of study and the notion that obesity increases the risk of getting bowel cancer with postgraduate participants less likely to recognize this ( $\chi^2= 17.18$ ,  $P = 0.05$ ). Furthermore, participants in their final year were more likely to think correctly that it is better to for a person's health to have fat around the hip and thighs than around the stomach and waist ( $\chi^2= 13.33$ ,  $P = 0.05$ ) as presented in Table 4.4.

**Table 4.3 Associations between gender and knowledge of health risks of obesity  
(n = 170)**

Items	Male (%)	Female (%)
<b>A person with a ‘beer-belly’ shaped stomach has an increased risk of getting diabetes.</b>		
True (correct response)	68.9	64.5
False	31.1	35.5
<b>Obesity increases the risk of getting bowel cancer.</b>		
True (correct response)	60	68
False	40	32
<b>An obese person who gets diabetes needs to lose at least 40% of their body weight for clear health benefits.</b>		
True	68.9	78.2
False (correct response)	31.1	21.8
<b>Obese people can expect to live as long as non-obese person. **</b>		
True	22.2	5.6
False (correct response)	77.8	94.4
<b>Obesity increases the risk of getting breast cancer after menopause.</b>		
True (correct response)	28.9	34.5
False	71.1	65.6
<b>Obesity is more of a risk to health for people from South-Asia (e.g. India and Pakistan) than it is for White European.**</b>		
True (correct response)	31.1	8
False	68.9	92
<b>There is no major health benefit if an obese person who gets diabetes loses weight.</b>		
True	13.3	9.6
False (correct response)	86.7	90.4
<b>Obesity does not increase the risk of developing high blood pressure**</b>		
True	8.9	1.6
False (correct response)	91.1	98.4
<b>It is better for a person’s health to have fat around the hips and thighs than around the stomach and waist.</b>		
True (correct response)	53.3	55.2
False	46.7	44.8
<b>Obesity increases the risk of getting a food allergy.</b>		
True	29.5	18.7
False (correct response)	70.5	81.3

\*\* Significant differences between groups at P< 0.05



**Table 4.4 Associations between the year of study and knowledge of health risks of obesity (n = 170)**

	Yr. 1	Yr. 2	Yr.3	Yr.4	PG (%)
<b>A person with a ‘beer-belly’ shaped stomach has an increased risk of getting diabetes.</b>					
True (correct response)	70.7	67.7	65.9	66.7	47.1
False	29.3	32.3	34.1	33.3	52.9
<b>Obesity increases the risk of getting bowel cancer. **</b>					
True (correct response)	75.6	74.2	71.8	61.5	23.5
False	24.4	25.8	28.2	38.5	76.5
<b>An obese person who gets diabetes needs to lose at least 40% of their body weight for clear health benefits.</b>					
True	85.4	63.3	82.9	65	82.4
False (correct response)	14.6	36.7	17.1	35	17.6
<b>Obese people can expect to live as long as non-obese person. **</b>					
True	4.9	16.1	4.9	5	35.3
False (correct response)	95.1	83.9	95.1	95	64.7
<b>Obesity increases the risk of getting breast cancer after menopause.</b>					
True (correct response)	29.3	31	35.9	36.8	29.4
False	70.7	69	64.1	63.2	70.6
<b>Obesity is more of a risk to health for people from South-Asia (e.g. India and Pakistan) than it is for White European. **</b>					
True (correct response)	4.9	12.9	14.6	12.5	41.2
False	95.1	87.1	82.9	87.5	58.8
<b>There is no major health benefit if an obese person who gets diabetes loses weight.</b>					
True	9.8	19.4	7.3	5	17.6
False (correct response)	90.2	80.6	92.7	95	82.4
<b>Obesity does not increase the risk of developing high blood pressure**</b>					
True	0	0	0	5	23.5
False (correct response)	100	100	100	95	76.5
<b>It is better for a person’s health to have fat around the hips and thighs than around the stomach and waist.*</b>					
True (correct response)	43.9	51.6	41.5	75	70.6
False	56.1	48.4	58.5	25	29.4
<b>Obesity increases the risk of getting a food allergy.</b>					
True	31.7	16.7	9.8	28.2	18.8
False (correct response)	68.3	83.3	85.4	71.8	81.2

\*\* Significant differences between groups at P< 0.05. All responses are expressed as percentages.

#### **4.4.3 Body Mass Index**

Table 4.5 illustrates the knowledge the participants in the different body mass index groups had about health risks associated with obesity. The association between knowledge items and the body mass index was very low and not statistically significantly ( $\chi^2 = 0.56$ ,  $p < 0.05$ ). Very few individual knowledge questions had significant associations with the body mass index. Significantly more Underweight participants underestimated the health risks of obesity for people from South –Asia than it is for White Europeans as presented in Table 4.5.

#### **4.4.4 Ethnicity**

Table 4.6 illustrates the knowledge the participants in the different ethnic group had about health risks associated with obesity. The association between knowledge items and the ethnicity was very low and not statistically significantly ( $\chi^2 = 1.02$ ,  $p < 0.05$ ). Very few individual knowledge questions had significant associations with the ethnic group. The ethnic group was significantly associated with the knowledge item that obese people cannot expect to live long as non-obese people with Black participants less likely to answer correctly ( $\chi^2 = 21.92$ ,  $P = 0.05$ ). Furthermore, significantly more White participants were more likely to answer correctly that there were health benefits for obese person who decides to loose weight ( $\chi^2 = 10.44$ ,  $P = 0.05$ ).

**Table 4.5 Associations between the BMI group and knowledge of health risks associated with obesity by the body mass index (n = 170)**

	Underweight	Normal	Overweight	Obese (%)
<b>A person with a ‘beer-belly’ shaped stomach has an increased risk of getting diabetes.</b>				
True (correct response)	54.5	66.3	73.3	66.7
False	45.5	33.7	26.7	33.3
<b>Obesity increases the risk of getting bowel cancer.</b>				
True (correct response)	59.1	67	63.3	77.8
False	40.9	33	36.7	22.2
<b>An obese person who gets diabetes needs to lose at least 40% of their body weight for clear health benefits.</b>				
True	86.4	73.4	73.3	88.9
False (correct response)	13.6	26.6	26.7	11.1
<b>Obese people can expect to live as long as non-obese person.</b>				
True	13.6	9.5	13.3	11.1
False (correct response)	86.4	90.5	86.7	88.9
<b>Obesity increases the risk of getting breast cancer after menopause.</b>				
True (correct response)	38.1	36.3	30	33.3
False	61.9	63.7	70	66.7
<b>Obesity is more of a risk to health for people from South-Asia (e.g. India and Pakistan) than it is for White European.**</b>				
True (correct response)	9.1	11.6	13.3	55.6
False	90.9	87.4	86.7	44.4
<b>There is no major health benefit if an obese person who gets diabetes loses weight.</b>				
True	4.5	11.6	10	11.1
False (correct response)	95.5	88.4	90	88.9
<b>Obesity does not increase the risk of developing high blood pressure</b>				
True	0	4.2	3.3	0
False (correct response)	100	95.8	96.7	100
<b>It is better for a person’s health to have fat around the hips and thighs than around the stomach and waist.</b>				
True (correct response)	40.9	60	46.7	55.6
False	59.1	40	53.3	44.4
<b>Obesity increases the risk of getting a food allergy.</b>				
True	38.1	19.1	16.7	22.2
False (correct response)	61.9	80.9	83.3	77.8

\*\* Significant differences between groups at  $P < 0.05$ . All responses expressed in percentages.

**Table 4.6 Associations between the ethnic group and the knowledge of health risks associated with obesity (n = 170)**

	White	Coloured	Black	others.
<b>A person with a ‘beer-belly’ shaped stomach has an increased risk of getting diabetes.</b>				
True (correct response)	66.7	63.3	74.1	61.9
False	33.3	36.7	25.9	38.1
<b>Obesity increases the risk of getting bowel cancer.</b>				
True (correct response)	72.4	68.5	51.9	61.9
False	27.6	31.5	48.1	38.1
<b>An obese person who gets diabetes needs to lose at least 40% of their body weight for clear health benefits.</b>				
True	66.7	77.8	88.9	61.9
False (correct response)	33.3	22.2	11.1	38.1
<b>Obese people can expect to live as long as non-obese person. **</b>				
True	3.3	3.3	29.6	23.8
False (correct response)	96.7	96.7	70.4	76.2
<b>Obesity increases the risk of getting breast cancer after menopause.</b>				
True (correct response)	37.9	25.3	44.4	40.0
False	62.1	74.7	54.6	60.0
<b>Obesity is more of a risk to health for people from South-Asia (e.g. India and Pakistan) than it is for White European. **</b>				
True (correct response)	6.7	8.8	25.9	28.6
False	93.3	90.1	74.1	71.4
<b>There is no major health benefit if an obese person who gets diabetes loses weight. **</b>				
True	0	7.7	18.5	23.8
False (correct response)	100	92.3	81.5	76.2
<b>Obesity does not increase the risk of developing high blood pressure</b>				
True	0	2.2	11.1	4.8
False (correct response)	100	97.8	88.9	95.2
<b>It is better for a person’s health to have fat around the hips and thighs than around the stomach and waist.</b>				
True (correct response)	53.3	54.9	55.6	52.4
False	46.7	45.1	44.4	47.6
<b>Obesity increases the risk of getting a food allergy.</b>				
True	26.7	17.8	23.1	25.0
False (correct response)	73.3	82.2	76.9	75.0

\*\* Significant differences between groups at P< 0.05 .All responses expressed in percentages.

#### 4.5 BELIEFS ABOUT OBESITY

Participants rated a series of statements relating to the causes and consequences of obesity on a four-point Likert scale ranging from strongly disagree to strongly agree. The majority of the participants rated poor eating habits (88.8%) and lack of exercise (85.9%) as important causes of obesity as illustrated in Table 4.7. Approximately 73% of the participants viewed biological disorders as a very important cause of obesity. However, 38.7% of the study sample rated lack of willpower as a very important cause of obesity.

Table 4.8 summarizes the mean scores of the participants on the BAOP scale using t-test and ANOVA. The scores ranged from 9.6 (SD= 3.74) to 14.06 (SD= 4.22). A higher score indicates a stronger belief that obesity is not under the obese person's control. The result of the t-test indicated that there was significant difference in the BAOP mean scores for gender with male participants more likely to have a stronger belief that obesity is not under individual's control ( $t_{(168)} = 2.257, p = 0.025$ ).

As illustrated in Table 4.8, the results of the ANOVA indicated a significant difference in the mean scores of BAOP at the level of 0.05 for the year of study with postgraduate students ( $F = 3.862, d = 3, p = 0.005$ ) more likely to have a stronger belief that obesity is not under the control of obese people. The results showed a significant difference with regard to belief about the causes of obesity with Black participants ( $F = 4.662, d = 3, p = 0.002$ ) and Indian/Malay participant ( $F = 4.662, d = 3, p = 0.012$ ) more likely to view obesity as beyond individual's control. The result showed no significant difference with body mass index.

**Table 4.7 Percentages with various responses to beliefs about the causes of obesity among the participants (n = 170)**

Questions	Agree	Disagree	Correct (%)
The majority of obese people have poor eating habits that lead to their obesity.	88.8	11.2	11.2
Obesity is usually caused by overeating	85.9	14.1	14.1
Most obese people cause their problem by not getting enough exercise	85.9	14.1	14.1
People can be addicted to food just as others are addicted to drugs and these people become obese.	82.9	17.1	17.1
Obesity occurs when eating is used as form of compensation for a lack of love or attention.	75.1	24.9	24.9
Most obese people eat more than non-obese people.	24.8	89	24.8
In many cases obesity is a result of biological disorder.	72.8	27.2	72.4
Obesity is rarely caused by a lack of willpower.	38.7	61.3	38.7

For the clarity of the table, the responses 'strongly agree' and 'agree' were collapsed into 'agree' and the responses 'strongly disagree' and 'disagree' were collapsed into 'disagree'

**Table 4.8 Relationship between Sociodemographic factors and BAOP scales using t-test and ANOVA.**

Characteristics	Mean	SD	p-value
<b>Gender</b>			
Male	12.18	4.17	
Female	10.58	4.02	
			*0.025
<b>Year of study</b>			
Year 1	10.02	3.79	NS
Year 2	10.32	3.96	NS
Year 3	10.51	3.98	NS
Year 4	11.75	4.08	NS
Post graduate	14.06	4.22	**0.002
<b>Ethnic group</b>			
White	9.6	3.74	NS
Coloured	10.55	4.11	NS
Black	12.93	3.45	**0.002
Others	12.48	4.3	**0.012
<b>Body Mass Index</b>			
Underweight	10.05	3.63	NS
Normal	11.24	4.08	NS
Overweight	11.03	4.34	NS
Obese	12.78	3.19	NS
<b>Overall mean score</b>	<b>11.01</b>	<b>4.11</b>	

\*The mean difference is significant at the level of 0.05 for t-test.

\*\* The mean difference is significant at the level of 0.05 for ANOVA.

## 4.6 SOCIODEMOGRAPHIC FACTORS ASSOCIATED WITH BELIEFS ABOUT OBESITY.

### 4.6.1 Gender

Table 4.9 illustrates the beliefs the participants had about the causes of obesity by gender. A higher score indicates more agreement that each factor contributes to a person being obese. The association between the belief items and the gender was low and not statistically significant ( $\chi^2= 0.56, P = 0.05$ ).

There was a significant difference between the males and females with regards to the belief that obese people eat more than non-obese people ( $\chi^2= 7.74$ ,  $P = 0.05$ ) with the male participants less likely to endorse the notion.

#### **4.6.2 Year of study**

Table 4.10 illustrates the belief the participants in the different study years had about obesity. A higher score indicates more agreement that each factor contributes to a person being obese. The association between the belief items and the year of study was low and not statistically significantly ( $\chi^2= 2.12$ ,  $P = 0.05$ ).

Very few individual belief questions had significant associations with the year of study with the participants either agreed or disagreed about causes of obesity. There was a significant difference between the year of study and a belief that obesity occurs when eating is used as a form of compensation for lack of love ( $\chi^2= 34.68$ ,  $P = 0.05$ ). Participant in their first year of study were more likely to accept the notion that overeating is the primary cause of obesity ( $\chi^2= 13.52$ ,  $P = 0.05$ ) as presented in Table 4.10.



**Table 4.9 Associations between beliefs about the causes of obesity and gender (n=170)**

	Male (%)	Female (%)
<b>Obesity often occurs when eating is used as a form of compensation for lack of love or attention.</b>		
Disagree (correct response)	38.6	20
Agree.	61.4	80
<b>In many cases, obesity is the result of a biological disorder.</b>		
Disagree.	31.1	25.8
Agree (correct response).	68.9	74.2
<b>Obesity is usually caused by overeating.</b>		
Disagree (correct response).	22.2	11.2
Agree.	77.8	88.8
<b>Most people cause their problem by not getting enough exercise.</b>		
Disagree (correct response).	17.8	12.8
Agree.	82.2	87.2
<b>Most obese people eat more than non-obese people. **</b>		
Disagree (correct response).	40	19.4
Agree.	60	80.6
<b>The majority of obese people have poor eating habits that lead to their obesity.</b>		
Disagree (correct response).	17.8	8.9
Agree.	82.2	91.1
<b>Obesity is rarely caused by a lack of willpower.</b>		
Disagree.	59.1	62.1
Agree (correct response).	40.9	37.9
<b>People can be addicted to food just as others are addicted to drugs, and these people usually become obese.</b>		
Disagree (correct response).	20	16
Agree.	80	84

\*\*Significant differences between groups at  $P < 0.05$ . All responses expressed as percentages.

**Table 4.10 Association between beliefs about the causes of obesity by the year of study group (n = 170)**

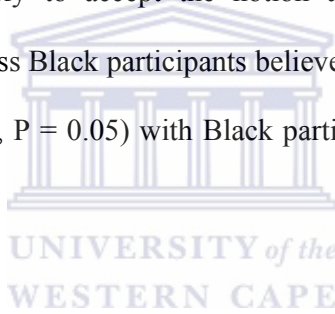
	Y1	Y2	Y3	Y4	Postgrad.
<b>Obesity often occurs when eating is used as a form of compensation for lack of love or attention.**</b>					
Disagree (correct response)	12.2	9.7	26.8	25	81.3
Agree	87.3	90.3	73.2	75	18.7
<b>In many cases, obesity is the result of a biological disorder.</b>					
Disagree	22	25.8	30	32.5	23.5
Agree (correct response)	78	74.2	70	67.5	76.5
<b>Obesity is usually caused by overeating. **</b>					
Disagree (correct response)	14.6	3.2	12.2	12.5	41.2
Agree.	85.4	96.8	87.8	87.5	58.8
<b>Most people cause their problem by not getting enough exercise.</b>					
Disagree (correct response)	4.9	22.6	9.8	17.5	23.5
Agree.	95.1	77.4	90.2	82.5	76.5
<b>Most obese people eat more than non-obese people**</b>					
Disagree (correct response)	12.2	25.8	25	25	52.9
Agree.	87.8	74.2	75	75	47.1
<b>The majority of obese people have poor eating habits that lead to their obesity.</b>					
Disagree (correct response)	14.6	12.9	7.3	5.1	23.5
Agree.	85.4	87.1	92.7	94.9	76.5
<b>Obesity is rarely caused by a lack of willpower.</b>					
Disagree	53.7	51.6	73.2	65	60
Agree (correct response)	46.3	48.4	26.8	35	40
<b>People can be addicted to food just as others are addicted to drugs, and these people usually become obese.</b>					
Disagree (correct response).	14.6	9.7	12.2	27.5	23.5
Agree.	85.4	90.3	87.8	72.5	76.5

\*\* Significant differences between groups at P< 0.05. All responses are expressed as percentages

### 4.6.3 Ethnicity

Table 4.11 illustrates the beliefs the participants in the different ethnic group had about obesity. A higher score indicates more agreement that each factor contributes to a person being obese. The association between the belief items and the different ethnic group was not statistically significant ( $\chi^2= 1.15$ ,  $P = 0.78$ ).

Very few individual belief questions had significant associations with the ethnicity with the participants incorrectly agreed about the causes of obesity. There was a significant difference between ethnic groups about the belief that obesity occurs when eating is used as a form of compensation for lack of love ( $\chi^2= 19.36$ ,  $P = 0.05$ ) with Black participants less likely to accept the notion as illustrated in Table 4.11. Furthermore, significantly less Black participants believed that obese individuals have poor eating habit ( $\chi^2= 14.13$ ,  $P = 0.05$ ) with Black participants less likely to endorse this notion.



### 4.6.4 Body Mass Index

Table 4.12 illustrates the beliefs the participants had about the causes of obesity by body mass index group. A higher score indicates more agreement that each factor contributes to a person being obese. The association between the belief items and the gender was low and not statistically significant ( $\chi^2= 2.56$ ,  $P = 0.78$ ).

There was no significant difference between the body mass index group and any of the individual belief items as presented in Table 4.12.

**Table 4.11 Associations between the beliefs about causes of obesity by ethnic group (n= 170)**

	White	Coloured	Black	Others
<b>Obesity often occurs when eating is used as a form of compensation for lack of love or attention.**</b>				
Disagree (correct response)	6.7	22	55.6	23.8
Agree.	93.3	78	44.4	76.2
<b>In many cases, obesity is the result of a biological disorder.</b>				
Disagree	31	27.5	29.6	19
Agree (correct response).	69	72.5	70.4	81
<b>Obesity is usually caused by overeating.</b>				
Disagree (correct response).	6.7	13.2	22.2	14.3
Agree.	93.3	86.8	77.8	85.7
<b>Most people cause their problem by not getting enough exercise.</b>				
Disagree (correct response)	10	15.4	11.1	19
Agree	90	84.6	88.9	81
<b>Most obese people eat more than non-obese people.</b>				
Disagree (correct response)	16.7	21.1	40.7	33.3
Agree.	83.3	78.9	59.3	67.4
<b>The majority of obese people have poor eating habits that lead to their obesity. **</b>				
Disagree (correct response).	3.3	6.7	29.6	19
Agree.	96.7	93.3	70.4	81
<b>Obesity is rarely caused by a lack of willpower.</b>				
Disagree.	80	57.1	48	66.7
Agree (correct response).	20	42.9	52	33.3
<b>People can be addicted to food just as others are addicted to drugs, and these people usually become obese.</b>				
Disagree (correct response).	20	12.1	29.6	19
Agree.	80	87.9	70.4	81

\*\* Significant differences between groups at  $P < 0.05$ . All responses are expressed as percentages.

**Table 4.12 Associations between the beliefs about causes of obesity and body mass index group (n = 170)**

	<18.5	Normal	Overweight	Obese
<b>Obesity often occurs when eating is used as a form of compensation for lack of love or attention.</b>				
Disagree (correct response)	13.6	25.5	33.3	44.48
Agree.	86.4	74.5	66.7	55.6
<b>In many cases, obesity is the result of a biological disorder.</b>				
Disagree	18.2	25.3	43.3	33.3
Agree (correct response).	81.8	74.7	56.7	66.7
<b>Obesity is usually caused by overeating.</b>				
Disagree (correct response).	4.5	16.8	13.3	22.2
Agree.	95.5	83.2	86.7	77.8
<b>Most people cause their problem by not getting enough exercise.</b>				
Disagree (correct response)	4.5	14.7	13.3	33.3
Agree	95.5	85.3	86.7	66.7
<b>Most obese people eat more than non-obese people.</b>				
Disagree (correct response)	22.7	22.3	43.3	22.2
Agree.	77.3	77.7	56.7	77.8
<b>The majority of obese people have poor eating habits that lead to their obesity.</b>				
Disagree (correct response).	13.6	10.5	13.3	11.1
Agree.	86.4	89.5	86.7	88.9
<b>Obesity is rarely caused by a lack of willpower.</b>				
Disagree.	59.1	64.5	60.0	44.4
Agree (correct response).	40.9	35.5	40.0	55.6
<b>People can be addicted to food just as others are addicted to drugs, and these people usually become obese.</b>				
Disagree (correct response).	13.6	17.9	13.3	22.2
Agree.	86.4	82.1	86.7	77.8

All responses are expressed as percentages.

#### 4.7 ATTITUDES TOWARDS OBESITY.

Participants rated a series of statements relating to the attitudes towards obese individuals on a five-point Likert scale ranging from 1-5. A higher score reflects greater bias towards obese people. A mean score of 2.5 indicates neutral attitudes about obese individuals. A mean score of more or less than 2.5 indicates a more negative or positive attitudes respectively. Female students had slightly more negative attitudes towards obese individuals than males as illustrated in table 4.13

**Table 4.13 Mean scores (SD) of the study samples on the Fat Phobia Scale (n = 170).**

Characteristics	Mean	SD
<b>Gender</b>		
Male	3.84	0.70
Female	3.99	0.55
<b>Year of study</b>		
Year 1	4.124	0.51
Year 2	4.08	0.688
Year 3	3.92	0.09
Year 4	3.80	0.49
Post graduate	3.69	0.59
<b>Ethnic group</b>		
White	3.98	0.65
Coloured	4.00	0.56
Black	3.88	0.60
Others	3.76	0.68
<b>Body Mass Index</b>		
Underweight	4.14	0.73
Normal	3.95	0.55
Overweight	3.91	0.49
Obese	3.69	0.59
<b>Overall sample score (n =170)</b>		
	3.95	0.60

## 4.8 SOCIO-DEMOGRAPHIC FACTORS AND ATTITUDE TOWARDS OBESITY

### 4.8.1 Gender

Table 4.14 illustrates the attitudes the participants had towards obese people by gender. A higher score indicates more negative attitude towards obese individuals. The association between the attitude items and the gender group was very low and not statistically significant ( $\chi^2= 0.005$ ,  $P = 0.05$ ). However, very few individual attitude items showed significant difference with the gender. There was a significant difference between males and females with regards to the attitudes towards obese people with females more likely to view obese people as having poor self control ( $\chi^2= 11.69$ ,  $p = 0.05$ ) and low self-esteem ( $\chi^2= 17.86$ ,  $p = 0.05$ ) respectively.

### 4.8.2 Year of study

Table 4.15 illustrates the attitudes the participants in the different study years had towards obese people. A higher score indicates more agreement to the negative adjective sometimes used to describe obese individuals. The association between the attitude items and the year of study was very low and not statistically significant ( $\chi^2= 2.64$   $P = 0.05$ ). However, very few individual attitude items showed significant difference with the year of study group. There was a significant difference between the year of study group with regards to the attitudes towards obese people with participants in their first year more likely to view obese people as lazy ( $\chi^2= 26.95$ ,  $p = 0.05$ ), overeats ( $\chi^2= 32.43$ ,  $p = 0.05$ ), inactive ( $\chi^2= 44.47$ ,  $p = 0.05$ ), weak ( $\chi^2= 33.65$ ,  $p = 0.05$ ) and low self-esteem ( $\chi^2= 33.92$ ,  $p = 0.05$ ).

**Table 4.14 Percentages with various responses to attitude questions for gender.**

Adjectives	Men	Women	$\chi^2$
Lazy	62.2	60.8	
No willpower	55.6	65.3	
Unattractive	57.8	57.3	
Poor self-control	62.2	78.2	11.69**
Slow	77.8	86.3	
Having no endurance	71.1	72.4	
Inactive	71.1	83.7	
Weak	42.2	51.6	
Self-indulgent	40.9	54.8	
Likes food	80.0	80.8	
Shapeless	64.4	56	
Overeats	68.9	84.8	
Insecure	73.3	85.6	
Low self esteem	71.1	85.6	17.86**

\*\* Significant difference between groups at  $p < 0.05$ .

All values represent the percentage of participants who endorsed each category (1 to 5). The higher the score the more the adjective endorsed by participants.



**Table 4.15 Percentages with various responses to attitude questions for year of study (n = 170).**

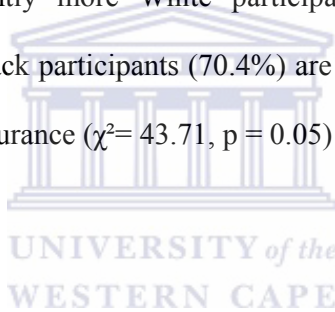
<b>Adjective</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	$\chi^2$
Lazy	65.9	64.5	61	55	58.8	26.95**
No willpower	70.7	64.5	63.4	59	47.1	
Unattractive	73.2	64.5	51.2	41	58.8	36.72**
Poor self-control	85.4	71	78	64.1	64.7	
Slow	92.7	83.9	85.4	76.9	76.5	
Having no endurance	65.9	71	78	84.2	58.8	
Inactive	92.7	77.4	78	84.2	52.9	44.47**
Weak	63.4	48.4	48.8	41	35.3	33.65**
Self-indulgent	58.5	61.3	53.7	48.7	12.5	
Likes food	87.8	83.9	82.9	75	64.7	
Shapeless	65.9	74.2	56.1	37.5	64.7	
Overeats	90.2	87.1	85.4	75	47.1	32.43**
Insecure	97.6	90.3	78	72.5	64.7	
Low self esteem	95.1	87.1	75.6	75	70.6	33.92**

\*\* Significant difference between groups at  $p < 0.05$ .

All values represent the percentage of participants who endorsed each category (1 to 5). The higher the score the more the adjective endorsed by participants. (1: Year 1, 2: Year 2, 3: Year 3, 4: Year 4, 5: postgraduate)

### 4.8.3 Ethnicity

Table 4.16 illustrates the attitudes the participants in the different ethnic group had towards obese people. A higher score indicates more agreement to the negative adjective sometimes used to describe obese individuals. The association between the attitude items and the ethnic group was very low and not statistically significant ( $\chi^2=1.308$  P = 0.05). However, very few individual attitude items showed significant difference with the ethnic group. There was a significant difference between the ethnic group with regards to the attitudes towards obese people with White participants more likely to accept the view that obese people are lazy ( $\chi^2= 29.84$ , p = 0.05). Moreover, significantly more White participants (83.3%) than Coloured participants (69.7%) and Black participants (70.4%) are more likely to endorse obese individuals as having no endurance ( $\chi^2= 43.71$ , p = 0.05) as illustrated in Table 4.16



### 4.8.4 Body Mass Index

Table 4.17 illustrates the attitudes the participants in the different BMI group had towards obese people. A higher score indicates more agreement to the negative adjective sometimes used to describe obese individuals. The association between the attitude items and the BMI group was very low and not statistically significant ( $\chi^2=1.584$  P = 0.05). However, very few individual attitude items showed significant difference with the BMI group. A significantly lower prevalence of obese participant (33.3%, 22.2%) than underweight participants (77%, 68.2%) and normal weight participants (75.8%, 45.3%) will characterized obese people as having no endurance ( $\chi^2= 14.79$ , P = 0.05) and self-indulgent ( $\chi^2= 12.41$ , P = 0.05) respectively.

**Table 4.16 Percentages with various responses to attitude questions for ethnicity (n = 170)**

Adjective	White	Coloured	Black	Others	$\chi^2$
Lazy	73.3	56.0	66.7	57.1	29.84**
No willpower	63.3	65.6	63.0	52.4	
Unattractive	66.7	52.2	66.7	57.1	
Poor self-control	76.7	76.7	59.3	76.2	
Slow	86.7	86.7	77.8	76.2	
Having no endurance	83.3	69.7	70.4	66.7	43.71**
Inactive	86.7	84.3	77.8	61.9	
Weak	46.7	50.0	55.6	42.9	
Self-indulgent	63.3	55.6	26.9	42.9	
Likes food	83.3	80.2	77.8	81.0	
Shapeless	53.3	54.9	70.4	66.7	
Overeats	83.3	89.0	59.3	66.7	
Insecure	86.7	81.3	74.1	90.5	
Low self esteem	83.3	82.4	74.1	90.5	

\*\* Significant difference between groups at  $p < 0.05$ .

All values represent the percentage of participants who endorsed each category (1 to 5). The higher the score the more the adjective endorsed by participants.

**Table 4.17 Percentages with various responses to attitude questions for body mass index.**

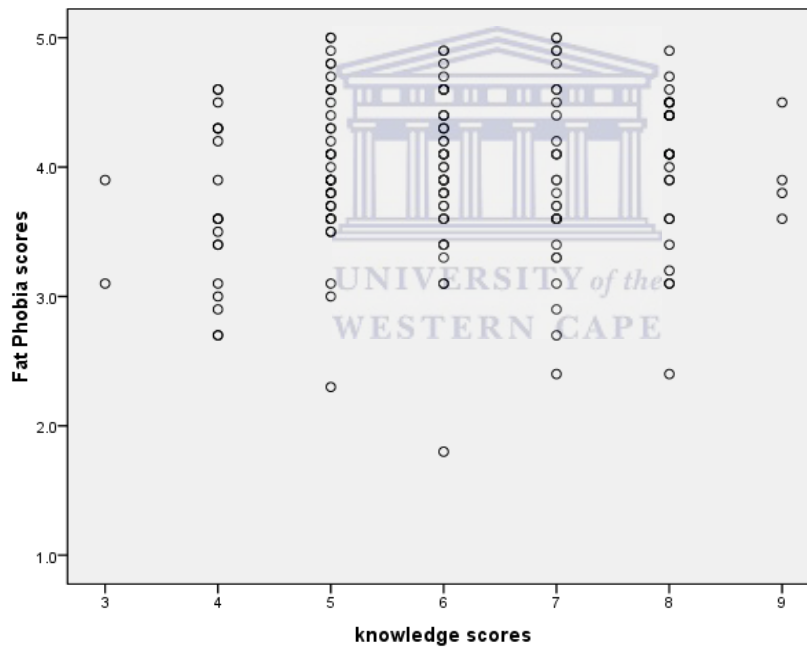
Adjective	Under	Normal	Over	Obese	$\chi^2$
Lazy	81.8	58.9	56.7	55.6	
No willpower	63.6	66.3	62.1	44.4	
Unattractive	59.1	56.8	58.6	55.6	
Poor self-control	86.4	77.9	69.0	55.6	
Slow	91.0	86.3	82.8	77.8	
Having no endurance	77.3	75.8	75.0	33.3	29.37**
Inactive	81.8	82.1	89.7	44.4	27.43**
Weak	68.2	45.3	51.7	22.2	25.16**
Self-indulgent	63.6	52.1	41.4	22.2	
Likes food	90.9	77.8	83.3	77.8	
Shapeless	72.7	53.7	63.3	66.7	
Overeats	81.8	82.1	80.0	66.7	
Insecure	90.9	85.3	76.7	55.6	
Low self esteem	90.9	85.3	73.3	77.8	

\*\* Significant difference between groups at  $p < 0.05$ .

All values represent the percentage of participants who endorsed each category (1 to 5). The higher the score the more the adjective endorsed by participants.

## 4.9 RELATIONSHIP BETWEEN KNOWLEDGE AND ATTITUDES

Figure 4.4 illustrates the relationship between the participant's knowledge of obesity and their attitudes towards obese people. The correlation between knowledge and attitudes was very weak and no significant correlation was found between the knowledge of obesity and attitudes towards obese people ( $r = 0.094$ ,  $p = 0.22$ )



**Figure 4.4 Correlation between knowledge of obesity and attitudes towards obesity**

#### **4.10 SUMMARY**

The current study aimed to assess the knowledge of, and attitudes towards obese people among the students of physiotherapy. A vast majority of the students are not well informed about the issues of obesity and also nearly all the participants hold more negative attitudes towards obese individuals. This underpins the need to introduce education regarding obesity in the current curriculum to promote positive attitudes among the students. The next chapter will present an integrated discussion of the data outlined in this chapter.



## **CHAPTER FIVE**

### **DISCUSSION**

#### **5.1 INTRODUCTION**

This chapter discusses the findings of the current study and compares the results with similar studies. The discussion follows a thematic approach rather than a discussion of individual objectives as stated in chapter one. Three themes are discussed: knowledge of risk of obesity, beliefs about causes of obesity and attitude towards obese people.

#### **5.2 KNOWLEDGE OF RISKS OF OBESITY**

There is a growing concern that despite healthcare professionals recognizing obesity as a life-threatening medical condition, they are often confused about the effectiveness of their interventions. Several studies have concluded that lack of knowledge of causes of obesity among healthcare professionals is known to mitigate the capacity to effectively intervene in obesity management. The present study highlights that students of physiotherapy demonstrated average levels of knowledge regarding obesity. This classification was based on the Obesity Risk Knowledge (ORK-10) with higher scores indicating professionals to be in better positions to direct the future of obesity prevention and intervention (Swift *et al.*, 2006). And the success of this role depends on the ability to recognize the consequence of obesity and show willingness to engage in obesity interventions (Kristeller & Hoerr, 1997).

In the current study participant's knowledge scores range from 3 to 9 on a scale of 10 with a mean score of 6.05 which is interpreted as an average level of knowledge. Analysis of individual's items showed that, 96.5% of the study participants knew that obesity increases the risk of developing high blood pressure, 24.5% knew that obese patients do not need to lose at least 40% of their body weight for clear health

benefits. While approximately 33% are aware that obesity increases the risk of breast cancer after menopause and item with the lowest percentage of correct responses (14.1%) was increased health risks associated with obesity in people from South Asia to European decent.

The results of the current study are consistent with the findings from the study of Swift, Sheard, and Rutherford (2007) conducted in the United Kingdom, which found that dietetic students achieved higher levels of knowledge with a mean score of 7.4 and showed an average level of knowledge in medical students (mean = 6.5), postgraduate nursing (mean = 6.0) and Diploma Nursing (mean = 5.7). The findings however differ from findings of Swift *et al.* (2006) which found median scores of 9 among experts in the field of obesity groups. The big discrepancy between the current study and that of Swift *et al.* (2006) could be attributed to the fact that their study had practicing experts in the field of obesity, who could be more knowledgeable and have more patient-client experience than the current participants.

Similarly, the current study is in agreement with the study of Swift *et al.* (2006) in the analysis of individual items, which found that among the non-expert group, 85% knew that obesity increases the risk of developing high blood pressure and 12% knew that an obese individual does not need to lose at least 40% of their body weight for clearer health benefits.

That the majority of the participants in the current study not recognize the risks and health consequences of obesity, are not surprising as these same findings were achieved among the non-expert group in the study of Swift *et al.*(2006). This however indicates that participants in the current study may not be well equipped to offer advice to obese patients. The findings highlight the need for introducing education



regarding obesity in the training programme for students. It further highlights the need to improve the existing education so as to increase knowledge about obesity and hence increase students' contributions in addressing health risks associated with obesity. This is important not only to increase knowledge and skills regarding obesity interventions but also to help overcome negative attitude against the people who are obese. Moreover, it is clear from the findings above that when the data was compared with previous studies of other professionals; dieticians were noted to be better informed to manage obesity, it is imperative to involve integration of other healthcare professionals / departments such as dieticians and nurses for comprehensive training programme.

The results of the current findings indicated that knowledge of risks of obesity showed an independent association with gender, year of study, ethnic group, and body mass index group. This finding concurs with the study of Parmenter, Waller, and Wardle (2000), which found that gender has no association with both general health-related and nutrition knowledge scores. Similarly, Swift *et al.* (2006) opined that the ORK-10 was not developed on the basis of separate gender sample. This is consistent with a study which found that gender has no correlation with general health related knowledge (Beier & Ackerman, 2003).

It could be assumed that professionals such as physicians, dietitians, physiotherapists and nurses all have a role to play in the management of obesity but the extent of their interventions regarding knowledge of obesity is independent of their gender, ethnic group and personal body weight.

### 5.3 BELIEF ABOUT CAUSES OF OBESITY

Studies have shown that the belief that healthcare professional endorse, to a large extent, affect the outcomes of the intervention towards the management of obesity. Furthermore, healthcare professionals who believe that the cause of obesity is under the personal control of obese people are more likely to express negative towards obese clients (Crandall, 1994). The current study employed the Beliefs About Obese Person Scale (BAOP) with higher scores indicating that obesity is beyond the control of individual and lower scores showing tendency to hold obese people responsible for their own weight (Allison *et al.*, 1991). The BAOP scores for the participants in the current study ranged from 3 to 23 on a scale of 32, with a mean score of 11.01. However, the findings of the study differ from that of Harris, Sandoval, and Cortese (1998) which reported an average mean score of 16.15 in a range of 2 to 34. The discrepancy between the current study and that of Harris *et al.* (1998) could be due to the fact that these authors employed nutrition students who may have received formal education regarding obesity in their training programme and as such have higher levels of knowledge about the causes of obesity.

The results of the current study also indicated that majority of the participants (88.8 %) viewed behavioural factors (overeating and lack of exercise) as major causes of obesity. Approximately 73 % rated biological disorder while 38.7 % rated psychological (lack of willpower) factors as important cause of obesity. These findings was consistent with several studies (Ogden & Flanagan, 2008; Foster *et al.*, 2003; Hankey *et al.*, 2004; Harvey & Hill, 2001) all of which established that healthcare professionals rated behavioural factors (overeating and physical exercise) as the most important cause of obesity.

The present study also provides evidence that participants show a greater endorsement of behavioural factors. Study has shown that health professionals who believe solely in behavioural causes of obesity are more likely to hold obese clients responsible for their weight. Pendleton, Schofield, & Havelock (1984) advised that the success of intervention strategies depends to a large extent on the agreement between professional-patient relationships about the nature of the problem. This however raises the issues concerning blame and responsibility which is associated with more negative attitudes when causes of obesity are linked to behavioural factors (Brownell, 1991). Moreover, this disagreement between healthcare professionals and patient has been attributed to the failure of obesity intervention in primary health care in identifying the cause of obesity (Wadden, 1993).

The current study showed that in terms of demographic influences on belief factors, gender was not statistically associated with the causes of obesity. This finding is in agreement with the study of Covic *et al.* (2007) which found no significant association between gender and belief factors. Similarly, this is also consistent with the study of Harris *et al.* (1998) which found that beliefs were not significantly associated with gender.

However, the data from the current study showed that gender difference was found across one behavioural factor, obese people eat more than non-obese people with female participants more likely to endorse this belief. This finding is consistent with the study of Covic *et al.* (2007) which found gender differences across the belief factors which were endorsed strongly by females than males. Similarly, these results are similar to other findings which emphasize that women feel more societal pressure

to be slim as mediated by media and the general public more than the males (Harris, Walters, Waschull, 1991).

The finding of this current study could mean that the tendency to hold obese individuals responsible for their own weight is stronger in female participants than their male counterparts.

#### 5.4 **ATTITUDES TOWARDS OBESE PEOPLE**

Research has concluded that negative attitudes towards obese people are endemic in our society. Several researchers have shown that obese individuals are discriminated against in workplace, school, employment, and other public interactions (Puhl & Brownell, 2001, 2003). Negative attitude is linked to the belief that obesity is under individual personal control as obese people are thought to be lazier and lack self-discipline (Loomis *et al.*, 2001).

The current study explored the attitudes of the participants towards obese people using Fat Phobia Scale, which measures a person's attitude about obese people using (Bacon *et al.*, 2001). The results highlighted the fact that a substantial number of students are less receptive towards obese people. Approximately 2.4% of the study participants achieved a score of less than 2.5 indicating positive attitudes while about 97.6% had score of greater than 2.5 indicating negative attitudes. This result is of great concern as it highlights that the vast majority of study participants being health professionals students possess negative attitudes towards obese individuals. Nevertheless, this finding is consistent with the study of Berryman *et al.* (2006) which found a similar prevalence (3%) of non-dietetics students in their study indicating positives towards obese individuals. However, the proportion of students with positive

attitudes (score of less than 2.5) in the current study (2.4%) is significantly lower than 13% of students with a major in dietetics indicating the positive attitudes (Berryman *et al.*, 2006). This difference could mean that dietetics students are better prepared to manage obesity than other health care professionals as shown in the studies of (Swift *et al.*, 2007) and (Campbell & Crawford, 2000).

Assessing individual attitude statements in the current study, the participants characterized an obese person as lazy, insecure, having a low self-esteem, poor self-control and having no endurance. In the current study, the majority of the participants (>60%) characterized obese people as slow, insecure, having low self-esteem, poor self-control, lazy and unattractive. These findings are consistent with numerous international studies (Berryman *et al.*, 2006; Wang *et al.*, 2004; Foster *et al.*, 2003; Wigton & McGaghie, 2001; Loomis *et al.*, 2001; Maddox & Liederman, 1969) which found that health care professionals exhibit negative attitudes towards obese individual. However, with the exception of Berryman *et al.*(2006), the current study found significantly higher proportions of participants with negative attitudes than the studies mentioned. This difference is not surprising as the studies mentioned had practicing professionals as their sample, which could be attributed to them being more knowledgeable with regards to the issue of obesity.

In summary, it is evident that the study participants strongly endorse this negative attitude towards obese individuals like other health care professionals as illustrated previously. Bacon *et al.* (2001) emphasized that the Fat Phobia Scale (FPS) could be used as a simple screening device to alert the healthcare providers who score high on the scale to be aware of their own negative attitudes towards obese people and design

intervention strategies to develop empathy to address the needs and concerns of obese clients.

The current study also explored the influence of participants own personal characteristics (body mass index, gender, and ethnic group) on the attitudes towards obese people. The findings showed that attitudes varied with gender, year of study, ethnic group and body mass group.

#### **5.4.1. Gender**

Attitude varied significantly with gender in the present study with some individual attitude items. Significantly, more female than male participants, were likely to characterize an obese person as insecure, to overeat, and with low self-esteem. Approximately 85 % of females and 69% of males labelled obese people as individuals that overeat. This was further supported with 86.3 % of females and 77.8% of males endorsing obese people as slow. The gender differences found in this study is consistent with the views of Chambliss *et al.* (2004) that women are less receptive towards obese people than their male counterparts. This is further supported by Latner *et al.* (2005) that women are more concerned about their weight and likely to show more weight bias than men. In contrast to current study, Glen and Chow (2002) found that women had more positive attitudes towards obese individuals. The discrepancy between the current study and that of Glen and Chow (2002) could be attributed to fact that different instruments were used to measure attitudes towards obese patients.

Allison *et al.* (1991) was in agreement with Glen and Chow (2002) in that the former's study in a developed country found that men had more positive attitudes towards obese individuals than their male counterparts.

### **5.4.2. Ethnicity**

Generally, several studies have confirmed that ethnicity is associated with negative attitudes towards obese persons (Latner *et al.*, 2005). Blacks are generally less likely to hold negative views towards people who are obese than their White counterparts. The present study extends prior findings by showing that Black participants were less likely to characterize obese people as inactive and as people who overeats than their White counterparts. For instance, approximately 63.3% of White participants endorsed obese people as self-indulgent with only 26.9% of Black participants holding the same view. These findings concurred with several studies conducted in the United States (Latner *et al.*, 2005; Perez-Lopez *et al.*, 2001; Straus, 2000). In one study conducted in the United States, Black women felt more attractive with a higher body weight than their White counterparts of the same body weight (Padgett & Biro, 2003). This study is consistent with one study conducted in South Africa which found that obesity is less stigmatized because it is attributable to riches and negative HIV status (Mvo *et al.*, 1999).

### **5.4.3. Body mass index**

Studies have shown that a negative attitude towards the obese person is in part influenced by an individual's body weight (Shoroff & Thompson, 2004; Davison & Birch, 2002). The findings from the present study showed that participants with a lower BMI portrayed more negative attitudes towards obese persons than participants with higher BMI. Approximately 77.3% of the participants with a lower BMI characterized obese people as having no endurance as against 33.3% in the group with a higher BMI. The result of these findings is in agreement with studies conducted in developed nations which found that people with a lower BMI are less receptive to

obese individuals than people with higher body weight who are found to more positive attitudes towards obese people (Shoroff & Thompson, 2004; Davison & Birch, 2002; Oberrieder *et al.*, 1995). However, the findings of this study differ from studies which found that individual's body mass index has no influence on the attitudes towards obese people (Berryman *et al.*, 2006; Chambliss *et al.*, 2004; McArthur & Ross, 1997). The lack of consistent finding on this aspect could possibly be due to different measures used for body mass index. For example, this study employed self-reported body weight and height for BMI while the study of Berryman *et al.* (2006) employed the use of measured weight and height for BMI.

#### **5.5 RELATIONSHIP BETWEEN KNOWLEDGE OF OBESITY AND ATTITUDES TOWARDS OBESE INDIVIDUALS**

The current study explores the influence of knowledge of study participants on issues regarding obesity and attitudes towards obese persons. The current study demonstrated that, relationship between knowledge of causes of obesity and attitudes towards obese person was not significant. This finding concurs with studies which found that general practitioners were aware of risks factors for obesity but such knowledge did improve attitudes towards obese person (Fogelman *et al.*, 2002; Campbell *et al.*, 2000). This could imply that knowledge of obesity is not enough to promote positive attitudes but has a role to play in providing accurate information about causes of obesity and may influence beliefs of individual responsibility of causes of obesity.



## 5.6 IMPLICATIONS FOR TRAINING/ CURRICULUM

The prevalence of overweight and obesity continue to rise astronomically despite the public health outcry. There is growing evidence that obese people are at a higher risk of health problems such as type 2 diabetes, hypertension, dyslipidemia, coronary heart disease, back pain, osteoarthritis, and some forms of cancers. Despite steady progress among the healthcare professionals to effectively manage obesity, efforts to improve health outcomes are overwhelmed by inability of practitioners to provide accurate information about causes of obesity and unfavourable attitudes towards obese individuals. This has led to delaying or underutilization of health care services by obese patients (Drury & Louis, 2002).

In the current study, 85% of the study participants did not receive formal information regarding obesity and 9% reported that information regarding obesity was not applicable to them. This is not surprising a study conducted in the United States indicated that 91 % of the internal medicine residents reported they did not receive special training in obesity management (Block *et al.*, 2003). Several other studies have shown that one of the barriers to effective management of obesity among healthcare professionals is the perceived inability or being ill-equipped to treat obese patients partly due to lack of formal education regarding obesity.

Participants in the current study demonstrated mixed responses to the question regarding responsibility towards obese patients. Approximately 40% of the respondents did not feel qualified to give advice to obese individuals while about 38 % were not sure if they are competent enough to provide advice regarding the management of obesity and obesity related conditions. The majority of the respondents in the current study noted they were not well prepared to offer

professional advice to obese patients indicating their possible desire to play a role in the current fight against the high prevalence of overweight and obesity. To discharge this role effectively, an insight into the current training programme must be improved to address the issues of obesity.

The findings of the current study might be an indication that the emphasis on education related to obesity in the physiotherapy curriculum is limited. It is therefore seems as if there is a need to improve physiotherapy curriculum to address obesity and other chronic diseases of lifestyles. Training should thus emphasize that being overweight and obese is caused by many factors and should encourage multiple interventions rather than one-way approach treatment.

Of concern is the fact that health professionals involved in the care of obese individuals fail to recognize that obesity is a product of many factors. Many a times, obesity is seen as a predominantly behavioural problem with physical inactivity and overeating as the most important cause putting it under the personal control of obese individuals. Similarly, a substantial proportion of the study participants in the present study believed that obesity is mainly caused by a lack of exercise and overeating. Unfortunately, this belief is not always true as various studies have shown that individual motivation to lose weight may be overwhelmed by biological and environmental factors (Lumeng, Appugliese, Cabral, Bradley, & Zuckerman, 2006). One study found that people are less likely to express negative attitudes towards obese people if they view the cause of obesity to be beyond the control of obese person (Crandall, 1994).

The current study findings have shown that the study participants, like other health professionals specializing in obesity and health professional students tends to endorse

negative attitudes towards people who are obese. These participants characterized obese people as lazy, slow, self-indulgent, insecure, and with no self-endurance consistent with the previous studies. It is striking to note that the level of negative attitudes towards obese people was higher than what was found in previous studies based on the results of Fat Phobia Scale and this reinforces the pervasive nature of obesity attitudes in the society. The purpose of the study is not to legitimize these negative attitudes towards obesity among the participants but to fashion out a way forward on how to promote positive attitudes among the health professional that will be specializing in obesity issues. It has been observed that health professional students are the future generations of obesity prevention and management and to do this effectively there is a need to increase education regarding obesity and the management there of. There are ongoing studies on different ways of promoting positive attitudes, most especially among the healthcare professionals. The first step in ensuring this is for providers to be aware of their own negative attitudes and how it affects the quality of treatment.

## **5.7 LIMITATIONS OF THE STUDY**

The results of the present study should be interpreted in the light of the following limitations:

- The sample of the study was selected conveniently. Furthermore, the sample included physiotherapy students attending one institution. Because of this, generalization to other physiotherapy students is thus limited.
- Data were analysed cross-sectionally, thereby limiting the ability to make causal inferences. An individual currently displaying negative/positive

attitudes to obese individuals will not necessarily continue to do so. Therefore caution should be exercised in interpreting the results of a cross-sectional study in the absence of a longitudinal data.

- Direct and parallel comparison with results of the study with those conducted in other parts of the world should be done with caution due to environmental, sampling and methodological variations between the different studies.



## **CHAPTER SIX**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **6.1 INTRODUCTION**

This chapter gives a summary and conclusion of the study. The major findings are highlighted and finally, recommendations made from the study are provided at the end of the chapter.

#### **6.2 SUMMARY AND CONCLUSION**

The aim of this study was to determine the knowledge and attitudes of physiotherapy students towards obesity at the University of the Western Cape, South Africa. To achieve this, knowledge of health risks associated with obesity, beliefs about the causes of obesity, and attitudes towards obese people were determined.

Literature surveyed has established the increasing numbers of overweight and obese people in both the developed and developing countries, South Africa inclusive. The prevalence is rising significantly, not only in the industrialized countries, but also in countries undergoing rapid economic transitions like South Africa. Health care professionals have been identified to have a role to play in directing the future of obesity management. However, literature surveyed has demonstrated that failure to identify the complex causes and consequences of obesity and negative attitudes towards obese individuals by health care professionals, have been identified to hamper the effective treatment of obesity and obesity related conditions.

The motivation for this study was based on the need to identify the knowledge of, causes of obesity and attitudes towards obese individuals among physiotherapy students. Data gotten from this study have the potentials of being useful for the improvement of the physiotherapy curricula, with regards to obesity, and to devise strategies to promote positive attitudes towards obese individuals among physiotherapy students.

The Department of Physiotherapy at the University of the Western Cape was chosen as the research setting. A descriptive quantitative study was then carried out to determine the knowledge and attitudes towards obesity among physiotherapy students. A cross-sectional study was used to collect information. One hundred and seventy five students took part in this study using a convenient sampling. A self-administered questionnaire consisting of close-ended questions was used to collect data. The questionnaire was adopted from three valid and reliable questionnaires, and a pilot study was conducted to further ensure its reliability and validity. Data was analysed using descriptive and inferential statistics. Descriptive statistics were used to determine the knowledge of obesity, beliefs about obesity, and attitudes towards obesity. Inferential statistics were used to test the association between students own socio-demographic factors, and knowledge, beliefs and attitudes.

Participants' age ranged from 17 to 48 years, with the mean age for both gender being 21.5 years. The majority of the study sample (73.5%) was female. Furthermore, the majority of the participants (85%) did not receive education regarding obesity, and only a few (23%) reported they could advise obese clients.

The questionnaire assessed the obesity risk knowledge, beliefs about the causes of obesity, and attitudes towards obesity using ORK-10, BAOP, and FPS respectively.

The results of the study showed that participants achieved a mean score of 6.05, which is interpreted as an average level of knowledge regarding risks of obesity. Furthermore, an overwhelming majority of the participants (88.8%) viewed obesity as largely a behavioural problem while nearly all the participants (97.6%) endorsed negative attitudes towards obese individuals.

Significant differences in the attitude items were found between gender, year of study, ethnic group, and body mass index. Similarly, the results revealed negligible/very weak correlation between knowledge regarding risks of obesity and attitudes towards obese individuals.

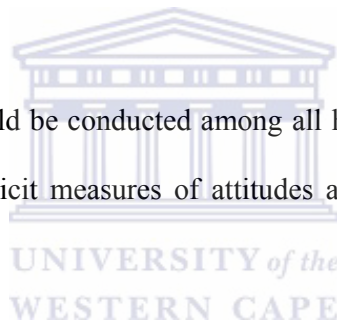
The aim and objectives of this study were achieved and the findings indicated most participants associate obesity with behavioural factors and largely endorse negative attitudes towards obesity. These findings are consistent with similar studies done in various other countries. This highlights the need to improve information regarding obesity in the training programme for physiotherapy students.

### **6.3 RECOMMENDATIONS**

- Physiotherapy training must include information regarding obesity, conditions related to obesity, and the management of obese individuals. The training must recognize not only the behavioural factors, but also other factors beyond the control of obese people.
- Students' negative attitudes towards obese individuals must be addressed because of its potential impact on practice. Training should accommodate a client-centred approach, recognizing the potential limitations and physical

needs of obese clients, in the promotion of exercise prescription for obese clients.

- Obesity should be managed with a team approach, rather than a single professional.
- The Health Professional Council of South Africa should include weight bias on the patients' rights policy. Furthermore, training with special emphasis on the management of obesity and obesity related conditions should be made compulsory for all institutions training health care professionals in South Africa.
- Future research should be conducted among all health care professionals with the use of both explicit measures of attitudes and Implicit Association Test (IAT).





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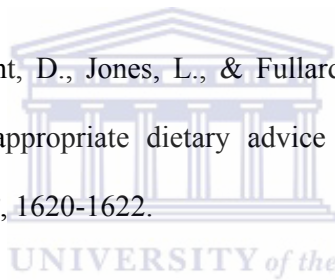


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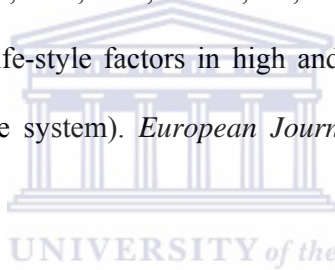
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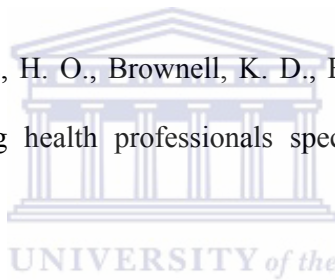
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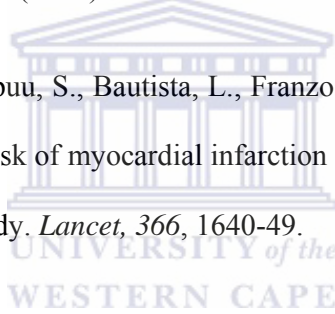
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# APPENDICES



UNIVERSITY *of the*  
WESTERN CAPE

## APPENDIX E

### QUESTIONNAIRE

#### SECTION A

#### SOCIAL DEMOGRAPHIC

1. GENDER  MALE  FEMALE

2. AGE IN YEARS \_\_\_\_\_

3. YEAR OF STUDY \_\_\_\_\_

4. WEIGHT (kg) \_\_\_\_\_ (please specify)

5. HEIGHT (m) \_\_\_\_\_ (please specify)

6. ETHNIC GROUP  WHITE  COLOURED  BLACK  OTHERS  
(Specify) \_\_\_\_\_

7. WHO IS THE HEAD OF YOUR HOUSEHOLD?

FATHER  MOTHER  OTHER (Specify) \_\_\_\_\_

8. THE HIGHEST QUALIFICATION OF THE HEAD OF HOUSEHOLD

PRIMARY EDUCATION  SECONDARY EDUCATION  TERTIARY  
EDUCATION.

9. DID YOU UNDERGO ANY FORMAL TRAINING IN OBESITY MANAGEMENT?

YES  NO  NOT APPLICABLE

10. IF THE ANSWER TO QUESTION 9 IS YES, WHERE DID YOU RECEIVE THE  
TRAINING?

UWC PHYSIOTHERAPY DEPT.  WORKSHOPS  CERTIFICATE COURSE  
 OTHERS

11. DO YOU FEEL ADEQUATELY INFORMED TO GIVE ADVICE ON OBESITY MANAGEMENT?

YES       NO       NOT SURE

**BELIEF ABOUT OBESE PERSONS SCALE**

**Please mark each statement below according to how much you agree or disagree with it.**

**Please do not leave any blank.**

1. Obesity often occurs when eating is used as a form of compensation for lack of love or attention.

Strongly Disagree     Disagree     Agree     Strongly Agree

2. In many cases, obesity is the result of a biological disorder.

Strongly Disagree     Disagree     Agree     Strongly Agree

3. Obesity is usually caused by overeating.

Strongly Disagree     Disagree     Agree     Strongly Agree

4. Most obese people cause their problem by not getting enough exercise.

Strongly Disagree     Disagree     Agree     Strongly Agree

5. Most obese people eat more than non-obese people.

Strongly Disagree     Disagree     Agree     Strongly Agree

6. The majority of obese people have poor eating habits that lead to their obesity.

Strongly Disagree     Disagree     Agree     Strongly Agree

7. Obesity is rarely caused by a lack of willpower.

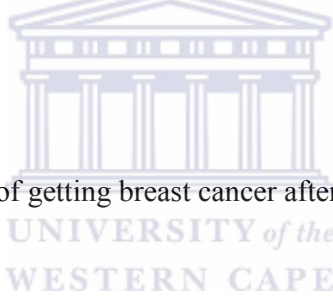
8. People can be addicted to food, just as others are addicted to drugs, and these people usually become obese.

Strongly Disagree     Disagree     Agree     Strongly Agree

## KNOWLEDGE

Please judge whether these statements are TRUE or FALSE by ticking the appropriate box.

1. A person with a 'beer-belly' shaped stomach has an increased risk of getting diabetes.  
 TRUE     FALSE
  
2. Obesity increases the risk of getting bowel cancer.  
 TRUE     FALSE
  
- 3 An obese person who gets diabetes needs to lose at least 40% of their bodyweight for clear health benefits.  
 TRUE     FALSE
  
4. Obese people can expect to live as long as non-obese person.  
 TRUE     FALSE
  
5. Obesity increases the risk of getting breast cancer after the menopause.  
 TRUE     FALSE
  
6. Obesity is more of a risk to health for people from South Asia (e.g. India and Pakistan) than it is for White Europeans.  
 TRUE     FALSE
  
7. There is **no** major health benefit if an obese person who gets diabetes loses weight.  
 TRUE     FALSE
  
8. Obesity does **not** increase the risk of developing high blood pressure.  
 TRUE     FALSE
  
9. It is better for a person's health to have fat around the hips and thighs than around the stomach and waist.  
 TRUE     FALSE



10. Obesity increases the risk of getting a food allergy.

TRUE     FALSE

**F-Scale**

**Directions: Listed below are 14 pairs of adjectives sometimes used to describe obese or fat people. For each adjective pair, please place an X on the line closest to the adjective that you feel best describes your feelings and beliefs.**

- |                                  |   |                   |
|----------------------------------|---|-------------------|
| 1. lazy                          | 5 _____ 4 _____ 3 _____ 2 _____ 1 _____ | industrious       |
| 2. no will power                 | 5 _____ 4 _____ 3 _____ 2 _____ 1 _____ | has will power    |
| 3. attractive                    | 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ | unattractive      |
| 4. good self-control             | 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ | poor self-control |
| 5. fast                          | 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ | slow              |
| 6. having endurance<br>endurance | 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ | having no         |
| 7. active                        | 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ | inactive          |
| 8. weak                          | 5 _____ 4 _____ 3 _____ 2 _____ 1 _____ | strong            |
| 9. self-indulgent                | 5 _____ 4 _____ 3 _____ 2 _____ 1 _____ | self-sacrificing  |
| 10. dislikes food                | 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ | likes food        |
| 11. shapeless                    | 5 _____ 4 _____ 3 _____ 2 _____ 1 _____ | shapely           |
| 12. undereats                    | 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ | overeats          |
| 13. insecure                     | 5 _____ 4 _____ 3 _____ 2 _____ 1 _____ | secure            |
| 14. low self-esteem              | 5 _____ 4 _____ 3 _____ 2 _____ 1 _____ | high self-esteem  |

**THANK YOU VERY MUCH FOR YOUR PARTICIPATION.**