BODY IMAGE AND ATTITUDE TOWARDS WEIGHT CONTROL OF BLACK WOMAN (25-44 YEARS) IN MANGAUNG

F C VENTER

BODY IMAGE AND ATTITUDE TOWARDS WEIGHT CONTROL OF BLACK WOMAN (25-44 YEARS) IN MANGAUNG

Francina Cornelia Venter

Dissertation submitted in fulfillment of the requirements for the degree

MAGISTER TECHNOLOGIAE:
FOOD AND CONSUMER SCIENCES

In the
Faculty of Management
School for Tourism, Hospitality and Sport

At

Technikon Free State

Supervisor: Dr CM Walsh, Ph D
Co-supervisors: Prof FJ Veldman, Ph D
Prof MS Slabber, Ph D

BLOEMFONTEIN

January 2003

Central University of Technology, Free State

Declaration of independent work:

DECLARATION WITH REGARD TO INDEPENDENT WORK

I, FRANCINA CORNELIA, identity number [redacted] and student number [redacted], do hereby declare that this research project submitted to the Technikon Free State for the Degree MAGISTER TECHNOLOGIAE: FOOD & CONSUMER SCIENCES, is my own independent work; and complies with the Code of Academic Integrity, as well as other relevant policies, procedures, rules and regulations of the Technikon Free State; and has not been submitted before to any institution by myself of any other person in fulfilment (or partial fulfilment) of the requirements for the attainment of any qualification.

SIGNATURE OF STUDENT

2003-03-10
DATE

ACKNOWLEDGEMENTS

This study would not have been possible without the assistance of the following persons:

- My supervisor, Dr CM Walsh, for her valuable assistance, advice and encouragement;
- My co-supervisors, Dr FJ Veldman and Prof M S Slabber for their input, advice, and guidance:
- The Department of Biostatistics, University of the Free State, for the valuable input regarding the statistical analysis of the data;
- The National Research Foundation (NRF) for the financial support in the execution of the study;
- The respondents for taking part in the study;
- My family and friends for their interest and moral support. Special thanks to my husband, without whom I could not have completed this task;
- My Heavenly Father, for giving me the ability to undertake this study.

SUMMARY

Many scientists today view obesity not only as one of the major risks to health, but also as a complicated phenomenon. Many factors seem to play a role in the aetiology of obesity, such as socio-economic status, biological variables, psychological differences and culture. As far as culture is concerned, various researchers have noted that obesity among South African women is more prevalent in the black population.

International studies suggested that black women tend to view themselves different than white women in terms of their body shape and size. Not only does culture seem to play a role in how these women view their own shape and size, but also in the satisfaction that individuals display with their bodies. African Americans, for instance, seem more satisfied with their bodies than their white counterparts.

The main objective of this study was to determine the body image and attitude towards weight control of black women in the Mangaung area situated in the central Free State, South Africa. A representative sample of 500 African women, (age groups 25-34, and 35-44 years), from the Mangaung area of Bloemfontein, was selected for the study. The study focused on how this population viewed obesity, as well as general attitude towards weight control. The sample was subjected to anthropometrical measurements to determine fat percentage, waist-hip-ratio, weight and height of each respondent. Body image was determined by having the subjects respond to a series of five photographs, each depicting one of five calculated body mass index categories. Attitude towards weight control was determined with a 21-item attitude scale. The respondents were required to respond to each of the items during an interview with the researcher.

More than fifty percent of the target population had a body mass index above 25kg/m^2. Fat percentage was very high, with mean percentages of 36.6% and 38.5% for the younger and older women respectively. More than 90 percent of the respondents had a high fat percentage (above 25%).

Almost a third of the respondents viewed the overweight body as healthiest. Obese people were also considered to be more wealthy. Results with regard to the relationship between body size and physical attractiveness were contradictory. Although black women considered obesity to be healthy it was often not seen as attractive. Although the overweight body was viewed by many respondents as attractive, many women also considered the lower normal body weight as attractive. Thus most women in the target population viewed either the overweight or lower normal weight body as most attractive. Bodies that were viewed as attractive were often not seen as healthy by the same respondent.

The body image of respondents and related satisfaction with larger bodies seems to influence eating behavior. Unlike the western view, this population was not motivated to control eating due to health concerns, as health was not considered by the respondents to be related to body size. Attitude towards weight control was not associated with percentage lifetime spent in an urban area.

Culture seemed to have a strong influence on the population's attitude towards weight control. Addressing cultural, social and socio-economical aspects should form an integral part of health education programmes aimed at obesity management in black South African women.

OPSOMMING

Tans beskou wetenskaplikes vetsug nie net as 'n hoof gesondheidsrisiko nie, maar ook as 'n komplekse verskynsel. Verskeie faktore soos onder andere sosio-ekonomiese status, biologiese veranderlikes, psigologiese verskille en kultuur blyk 'n rol te speel in die etiologie van vetsug. Verskeie navorsers het aangedui dat vetsug onder Suid-Afrikaanse vroue meer onder die swart populasie voorkom.

Internasionale studies suggereer dat swart vroue neig om hulself anders te beskou as die blanke vroue ten opsigte van hul liggaamsvorm en grootte. Kultuur blyk egter nie net 'n rol te speel in welke mate die vroue hul liggaamsvorms en grootte beskou nie, maar ook in die graad van tevredenheid wat individue ten opsigte van hulle liggame het. Afrikaan-Amerikaners, byvoorbeeld, blyk meer tevrede met hul liggame te wees as hul blanke eweknie.

Die hoofdoelwit van hierdie studie was om insig te verkry aangaande die persepsie van liggaamsgrootte en houding teenoor massabeheer in swart vroue in die Mangaung area, sentraal Vrystaat. 'n Verteenwoordegende steekproef van 500 swart vroue, (ouderdomsgroepe 25-34 en 35-44 jaar oud) was geselekteer vanuit die Mangaung area in Bloemfontein. Die studie het gefokus op die populasie se beskouing van vetsug, sowel as hul algemene houding teenoor gewigsbeheer. Antropometriese data van die respondente ten opsigte van vetpersentasie, heup-middelverhouding, gewig en lengte was versamel. Die liggaamsbeeld was bepaal deur die respondente te laat reageer op 'n reeks van vyf foto's, waarvan elkeen, een van vyf berekende liggaamsmassa-indeks kategorieë verteenwoordig. Houding teenoor gewigsbeheer was bepaal deur middel van

'n 21-item houdingskaal. Die respondente moes tydens 'n onderhoud op elk van die vrae antwoord.

Meer as vyftig persent van die teikenpopulasie het 'n liggaamsmassa-indeks bo 25kg/m^2 gehad. Vetpersentasie was hoog vir die jonger en ouer vroue onderskeidelik (36.6 % en 38.5 %). Meer as negentig persent van die respondente het 'n vet persentasie van bo 25% gehad.

Bykans een derde van die respondente het die oormassa-liggaam as die gesondste beskou. Die vetsugtige persone was ook beskou as die rykste. Resultate met betrekking tot die verwantskap tussen liggaamsgrootte en fisiese aantreklikheid was teenstrydig. Alhoewel swart vroue vetsug as gesond beskou het, was vetsug dikwels nie as aantreklik beskou nie. Die oormassa-liggaam was deur 'n groot persentasie (26.98% en 27.65% onderskeidelik) van respondente as aantreklik beskou, terwyl baie vroue (29.14% en 30.88%) die laer-normale-gewig liggaam as die mees aantreklike beskou het. Die meeste vroue in die teiken populasie het dus die oorgewig of laer-normaal-gewig liggaam as die aantreklikste beskou. Liggame wat as die mees aantreklikste beskou was, was egter dikwels nie waargeneem as gesond deur dieselfde respondente nie.

Die liggaamsbeeld van respondente en meegaande tevredenheid met groter liggaamsmassa blyk die eetgedrag te beïnvloed. Anders as die Westerse beskouing, was hierdie studiepopulasie nie gemotiveerd om hul eetgedrag te beheer weens gesondheidsoorwegings nie, en weens die feit dat gesondheid nie deur die respondente beskou is as verwant aan die liggaamsgrootte nie. Daar was geen verband tussen houding teenoor gewigsbeheer en die tydperk van verblyf in 'n stedelike gebied nie.

Uit die studie blyk dit dat kultuur nog steeds 'n sterk invloed op die populasie se houding teenoor gewigsbeheer het. Toekomstige gewigsbeheerprogramme om vetsug te bestuur in swart Suid-Afrikaanse vroue, behoort kulturele, sosiale en sosio-ekonomiese aspekte aan te spreek as 'n integrale deel van gesondheidsopvoeding.

TABLE OF CONTENTS PAGE

CHAPTER 3: METHODS

CHAPTER 5: DISCUSSION OF RESULTS

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

BMI	Body mass index
BRISK	Coronary Heart Disease Risk Factor Study in die African Population of the Cape Peninsula
CI	Confidence interval
cm	Centimeter
CORIS	Coronary Risk Factors Resurvey Study
CRISIC	Coronary Risk Factor Srudy
HIV	Human immunodeficiency virus
THUSA	Transition and Health during Urbanisation of South Africans
W/H^2	W is weight in kilograms and H is height in square meters
WHR	Waist-to-hip circumference ratio
>	Bigger than
<	Smaller than
≥	Equal to, and bigger than
≤	Equal to, and smaller than

LIST OF APPENDICES

CHAPTER 1

Introduction

1.1 Background and problem statement

Obesity is considered one of the most prevalent, yet preventable, health problems worldwide. The magnitude of the problem is indicated by the number of research projects, which have been completed and documented to determine the extent to which obesity is a health risk (Garfinkel, 1985; James, 1992; Lean *et al.*, 1998; Manson *et al.*, 1990; Ravussin, 2000; Seidell *et al.*, 1992). The South African society has also shown a great concern about obesity as a health risk (de Villiers *et al.*, 1988; Kruger *et al.*,1996; Meyer & van der Merwe, 1987; Walker & Segal, 1997). Obesity is associated with a wide range of pathological conditions such as hypertension, Type 2 diabetes mellitus, cardiovascular disease and early death (Björntorp, 2001; Bradshaw *et al.*, 1995; James, 1992; Lean *et al.*, 1998; Lew & Garfinkel, 1979; Popkin, 1998; Walker, 1995; Weich, 1995). Obesity can be classified as one of the major "cost drivers" in Western health-care systems due to the detrimental effect thereof on health status (Bradshaw *et al.*, 1995; Popkin, 1998).

Obesity appears to have been uncommon in western populations until the time of the Industrial Revolution. After the Industrial Revolution there was an increase in urbanisation (Walker, 1995). Urbanisation is associated with the availability of a wide variety of foods as well as processed foods, many of which are high in fat (Khan, 1996). Over the last decades the standard of living of most people has risen considerably in many countries. People that previously experienced food shortages have attained

dietary sufficiency (National Food Consumption Survey, 1998). In this period of change, the nutritional intakes of the general public have improved and energy intake has increased. As part of this "nutrition transition", less vegetable protein and more animal protein are consumed while less whole grain bread and more refined products, sugar, and fat are consumed. The nutrition transition generally involves a dietary shift away from high-fibre starchy foods towards more energy-dense fatty foods (Drewnowski & Popkin, 1997; Popkin *et al.*,1996). Simultaneously with a transition in nutrition, demographic and socio-economic changes have taken place. Levels of physical activity have decreased due to more sedentary occupations and readily available transportation (Popkin, 1998). The combination of all of these changes has caused an increasing level of obesity in developed countries, as well as in developing countries.

Nutritional patterns of the black population seem to be changing simultaneously with the adoption of a Western lifestyle. With urbanization, traditional societies usually adopt the eating habits of more affluent Western societies and they then enter the nutrition transition (Popkin, 1998). A combination of these changes has caused increasing levels of obesity in developing countries, such as Brazil (Monteiro *et al.*, 1995), Mauritius (Hodge *et al.*, 1996), Morocco (Chabir *et al.*, 1998) and South Korea (Kim *et al.*, 2000).

In South Africa the process of urbanisation is also associated with an increasing prevalence of obesity (Badenhorst & Walker, 1994). It is estimated that 75 percent of all South Africans are currently urbanised and the impact of this rapid urbanisation process on all aspects of health is a major problem (Prentice, 1997). This rapid urbanisation has become part of the process of under-development leading to considerable urban poverty (Yach *et al.*, 1990) and may be seen as a psychological and social process in which people of the rural areas adopt new ways of life (Fair, 1985).

Obesity is a serious health problem amongst African American women, and the prevalence of obesity is approximately twice as high in this group compared to white American women (Kumanyika, 1987; Rand & Kaldau, 1990). According to the Second National Health and Nutrition Examination Survey, 33.5 percent of African American women between 25 and 34 years, 40.8 percent between 35 and 44 years, and 61.29 percent between 45 and 54 years are "severely overweight" (National Center for Health Statistics, 1990).

The prevalence of obesity in South African populations is two to three times higher in black than in white women (Hoffman *et al.*,1997; Jooste *et al.*, 1988; Kalk, 2001; MacIntyre, 1998; Steyn *et al.*, 1991; Walker & Segal, 1997; Walker, 1995). Studies have indicated that approximately thirty percent of South African Black women have a BMI of higher than 30kg/m^2 (Mollentze *et al.*, 1995; Steyn *et al.*, 1991; Kruger *et al.*, 1994).

It has been suggested that one of the main reasons for the higher prevalence of obesity amongst black woman is that they tend to relate good health to increased body size. Reasons for this perception seem to include firstly that obese people will survive "lean" periods more effectively. A second reason for this perception is that obesity and financial wealth are considered related since obese people can afford more food. The literature further suggests that obesity is increasingly regarded as a sign of the absence of human immuno virus (HIV) (Prentice, 2000).

The Western view on the other hand differs greatly from views held by cultures in developing countries as far as the relationship between health and obesity is concerned. Traditionally, obesity carries a positive stigma in developing countries (Prentice, 1997) reflecting wealth and good living. In contrast, western cultures consider obesity to be

related to a decrease in physical attraction and health problems. This is evident by the typical images portrayed in fashion and health and fitness magazines. The western view of obesity and health is further demonstrated by the emphasis placed on eating habits and exercise such as sporting events and attendance of gymnasiums.

Health promotion is the first step towards the prevention of obesity. It would however, be difficult to design and implement programs without understanding the dimensions and boundaries of popular conceptions about obesity (Badura & Kickbush, 1991:191). Focus was originally placed on biological and biochemical factors involved in the development of obesity. More recently, however, psychological approaches such as psycho analysis and behaviourism have also attempted to explain the occurrence of obesity (Louw, 1995:457). Two factors that have received attention in recent years are body image and attitude towards weight control.

Parker *et al.* (1995) has revealed that African Americans are less likely to perceive themselves as overweight than their white counterparts. African American adolescents tend to perceive themselves as thinner than they actually are, while White American adolescents are prone to overestimate their body size. Social and cultural attitudes and beliefs are often given as reasons for non-compliance with information given during nutrition counseling (Craig & Caterson, 1991:421).

If a person views him or herself as thinner than they actually are, they would naturally tend to be less inclined to be involved in attempts to eat less or to alter their eating habits. It is therefore obvious that the perception one has of his/her body will have an impact on eating behaviour. Body perception and body image are terms generally used interchangeably in literature. The other factor which has received increasing attention, is

attitude towards weight control. The Oxford Advanced Learners Dictionary (1989:65) defines attitude as a way of thinking or behaving. A more elaborate definition is the tri-component approach. According to this approach attitude consists of cognitive, affective and behavioural components (Sears *et al.,* 1991:141). The cognitive component refers to one's beliefs and perception of facts. The affective component refers to the feelings and emotions with regard to something specific. In the determination of black women's attitude towards weight control, this component would refer to how they feel about weight control. The behavioural component relates to how people behave with regard to the target. In this study this component would refer to the tendency to exercise weight control.

The attitude-behaviour relationship has been thoroughly studied. Most studies yield positive results (Sears *et al.,* 1991:149). If there is a relationship between an attitude and behaviour, it can be assumed that people's attitude towards weight control will influence the probability to which they will alter their eating habits or maintain certain eating or dieting behaviours. According to Kruger *et al.* (1996), assessment of obese people's attitude towards weight control would clarify their behaviour in this respect.

Another important aspect related to body image and attitude is anthropometric status. Anthropometrical status is determined to verify the levels of obesity among women and these parameters give insight into the results of eating and dieting behaviour. Anthropometry can yield information on the relationship between how people perceive themselves (body perception) and actual body size. It may also give insight into the relationship between attitude towards weight control and the way that women perceive themselves. In a recent study by Slabber *et al.* (2000) it was shown that 96.2 percent of

South African black university students considered underweight and normal weight as most healthy.

By determining how women see themselves (body image), we may identify an important variable, which might influence eating behaviour. As already mentioned, studies in the United States suggest that black women tend to view themselves as thinner than they actually are. If this was the case in Mangaung, it might explain an important factor affecting attitude towards weight control among these women. By determining how these women feel about themselves (body dissatisfaction) we may be able to identify another variable affecting the way they eat. If these women, for instance, are happy with the way they appear, it might have an influence on their attitude towards weight control, or it could affect the way they eat and the resulting disease patterns.

Mangaung is an urban area where changes in diet and activity patterns have most likely occurred due to urbanisation and Westernisation. This makes Mangaung an ideal area to study body image and attitude towards weight control. Information of this nature is essential in understanding the association between lifestyle and health status and can make an indispensable contribution to the science of nutrition in developing countries.

It is important to fully understand the factors contributing to obesity. If these factors are not identified or their impact understood, public intervention will be ineffective.
Programs to decrease obesity among any cultural group should provide for the structuring of attitudes towards weight control. It would be futile to initiate efforts to control obesity if the members of the target group have a negative attitude towards weight control. It is obvious that if body image and attitude towards body weight are not

fully understood on a cultural level, costly mistakes could be made when efforts are made to address the problem.

The same holds true for body image. If a person considers him or herself to be obese and in fact attractive it would be very difficult to have such a person join a weight loss program. If the difference in body image across cultures is known, it might be less difficult to approach such a group more effectively in terms of healthy eating programs.

1.2 Objectives

The main objective of this study was to determine the body image and attitude towards weight control of black women aged 25-44 years in Mangaung.

The sub objectives were to determine:

1. Anthropometric status
2. Body image
3. Attitude towards weight control
4. The difference between attitude towards weight control of younger women (25-34) and older women (35-44)
5. The association between the BMI status and attitude towards weight control of black women
6. The association between percentage lifetime spent in an urban area and attitude towards weight control

1.3 Structure

This dissertation is presented in five main parts, namely an introduction, literature review, an empirical study, followed by conclusions and recommendations.

In the introduction a problem statement and objectives of the study are presented. The literature review summarises the factors affecting body image, and attitude towards weight control and describes different methods used by other researchers to the assess body image and attitude towards weight control. In the chapters on the empirical study the research methodology and results are presented. The results are discussed in Chapter 5. Conclusions and recommendations are made in the last chapter. The structure of the dissertation is shown in figure 1.1:

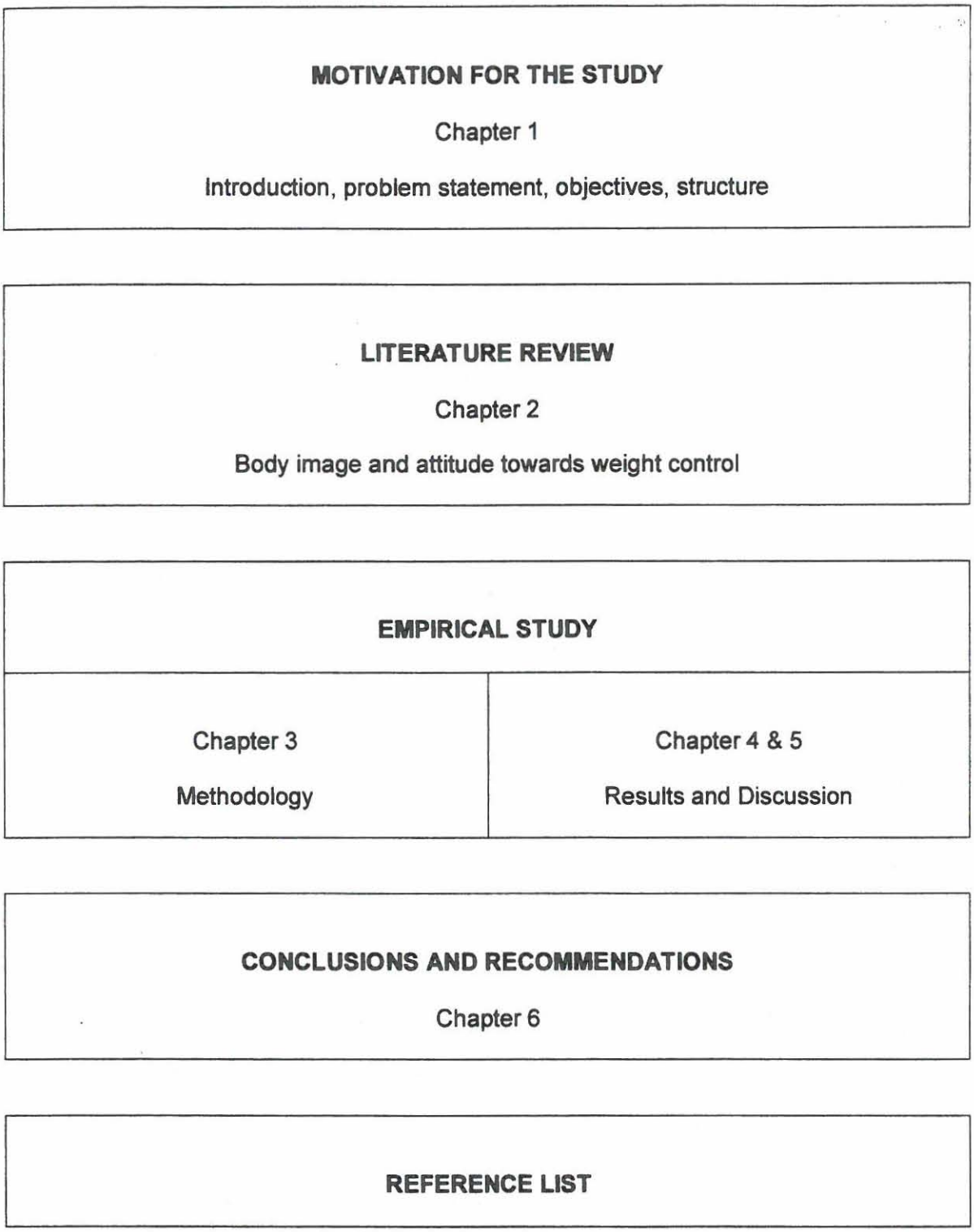


Figure 1.1: Structure of the dissertation

CHAPTER 2

LITERATURE REVIEW

2.1 Body image

The century-old concept of body image refers to one's psychological experiences of one's bodily appearance and functioning (Cash & Pruzinsky, 1990). The concept of body image has been called body precept, perceived body, body concept, body schemata, postural model, body ego and body boundary (Gellert *et al.,* 1971; Kolb, 1959:749-769; Zion, 1965). As far back as 1935, Schilder (1935:104 cited by Abood & Mason, 1997) defined body image as the picture a person has of his/her own body formed in the mind.

Body image includes two important components. The first is the way a person perceives or "sees" him or herself. More specifically it refers to the accuracy of his/her perception of his/her body. The "error" in their perception is referred to as body image distortion. In other words, body image distortion reflects the difference between the actual shape and size of his/her body and the shape and size they perceive their bodies to be. Some people who feel the need to diet may correctly perceive their body size to be undesirably large from the viewpoint of medical risk. People of similar body size, however may be less inclined to diet because they perceive their body size to be "just right". In literature (Combs & Snygg, 1991; King, 1981) it is also suggested that the more inaccurate people's body perception, the worse they feel about themselves.

Body dissatisfaction is the other component of body image. Body dissatisfaction refers to "negative" feelings about one's own body. Some people may for instance see themselves as slightly overweight but still feel attractive, while others who also view themselves slightly overweight feel unattractive. People with a high level of body dissatisfaction feel unhappy with the way they look (King, 1981).

One problem with a high level of body dissatisfaction is that it often has a negative influence on the individual's emotional life and inner happiness. In this regard, authors such as Cash & Pruzinsky, (1990) and Thompson *et al.*, (1991) have reported that a negative body image clearly decreases quality of life. Dissatisfaction with weight is the most silent source of a negative body image. Weight dissatisfaction is experienced by as many as 55 percent of women in America (Cash *et al.*, 1987).

In recent years, it has become clear that concerns about body image are important in understanding the aetiology and treatment of both eating disorders and obesity (Thompson *et al.*, 1996). Overemphasis on body weight and shape in self-evaluation is considered problematic and an indication of eating disorders (Fairburn & Wilson, 1993; Thomas, *et al.*, 1988; Wineman, 1980). Body dissatisfaction may make individuals more receptive to developing these disorders.

Understanding cultural differences with regard to body image can explain variance across cultures as far as eating behavior and anthropometric traits are concerned. For this reason it is important to understand the differences between cultures as far as body dissatisfaction and body image distortion are concerned (Stanhope & Lancaster, 1988:135).

A number of factors can affect body image. These include culture, socio-economic status, social perception of obesity, perceptions of overweight individuals, the relationship between body image and weight change behaviour, individual appearance, and perception of health as related to body size.

2.1.1 Contribution of culture to body image (obesity perception)

An increasing number of researchers argue persuasively that obesity should be conceptualized as a culture bound syndrome (Rittenbaugh, 1982; Stunkard & Sorensen, 1993).

A substantial segment of the Western population (Cash, 1985; Cash & Pruzinsky, 1990; Cash, *et al.,* 1986; Fallon, 1990) is dissatisfied with weight and body shape, especially females, as a result of cultural idealization of thinness (Polivy *et al.*, 1986). In the United States, fatness remains a stigmatized condition that can negatively affect a persons overall well-being (Powers, 1996). A national American body image survey (Cash *et al.,* 1986) found that 55 percent of female and 41 percent of males reported being dissatisfied with their weight. Studies showed that 40 percent of adult American women and 43 percent of female students were trying to lose weight at that time (Wardle & Marsland, 1990). Many people who did not need to lose weight were trying to do so. Studies indicated that normal-weight female adolescents often consider themselves to be overweight (Villarosa, 1994). In Western societies where thinness is a norm for beauty, young women are especially vulnerable to dissatisfaction with their shape and consequently are more prone to developing eating disorders (Cogan *et al.*, 1996; Cooper, 1995; Nasser, 1988).

In traditional Polynesian societies, obesity is seen as a sign of good health, wealth, prestige, beauty and high social ranking. Westernisation in Polynesian societies has brought with it not only the Western perception of a thin body size for women as ideal, but also increased problems of obesity and it's related diseases. In a study undertaken by Matangi *et al.* (1995) results indicated that older Cook Islanders perceived a larger body size as ideal. However the younger women had similar perceptions of ideal body size to Australian women. This suggested that there is a gradual adoption, by the young Cook Islands women of the Western norms of an ideal body size.

The studies that have examined race/ethnic differences consistently show that black American females are less likely to view themselves as overweight, are more satisfied with their body size and shape, and are less likely to be dieting compared to white females (Abrams et al., 1993; Desmond *et al.*, 1989; Gray et al., 1987; Kemper *et al.*, 1994; Wilson *et al.*, 1994). Research has found that African-American females are less concerned with weight, dieting, or being thin (Abrams, 1993; Akan & Grillo, 1995; Rucker & Cash, 1992). Sixty four percent stated that they would rather be "a little overweight" than " a little underweight." If they do diet, however, their attempts to lose weight are more realistic and less extreme than white women's attempts. These differences in body image may translate into healthier behaviour. While some research suggests that the gap is narrowing (Dacosta & Wilson, 1996; Hsu, 1987; Le Grange *et al*, 1997), most research (Abrams *et al.*, 1993; Akan & Grillo, 1995; Rucker & Cash, 1992; Pinkowish, 1995) acknowledges that eating disorders, especially anorexia and bulimia, are most prominently seen among white women. There are various reasons why African-American women as a cultural group seem to be better "protected" from body image distortions (Hsu, 1987; Root, 1990). Both groups of women partially base their judgements of their bodies on what men of their race desire (Parker *et al.*,1995). Since

African-American women believe that African-American males prefer larger women, they have less need to lose weigh and therefore, feel more attractive.

Ethnic differences have also been documented in relation to weight perception and weight loss behavior. As far back as 1979 Massara, reported that African American women's perceptions of what was normal weight greatly exceeded biomedical standards and that they associated large body size with health, sexuality, and economic and marital success. Massara's results (1979) are consistent with other reports that large, full-bodied women are accorded high status and considered healthy in traditional cultures (Cassidy, 1991; Messer, 1989).

The high prevalence of obesity in African American (Kumanyika *et al.*, 1993) and in black South African women (Kruger *et al.*, 1994) appears to be culturally more acceptable portraying a symbol of prosperity and dignity. In a study of 500 African-American women, approximately forty percent of the overweight women considered their figures to be attractive or very attractive, indicating a positive body image (Kumanyika *et al.*, 1993).

Findings in the United States suggest that African American females prefer a larger body size for themselves than do White American females (Kemper *et al.*, 1994; Parnell *et al.*, 1996; Wilson *et al.*,1994), and that African American males share this preference i.e., prefer larger bodied females (Maddox *et al.*, 1968; Thompson *et al.*, 1996).

2.1.2 Socio-economic status and body image

Throughout the nineteenth century, almost all societies associated heaviness with a high social status. During the twentieth century, however, these perceptions have been reversed in most developed countries. Research found the Western female body ideal as thin (Butler & Ryckman, 1993; Cohn & Adler, 1992; Garner & Garfinkel, 1980; Lamb *et al.*,1993; Myers & Biocca, 1992). In less-developed countries where the access to food is still uncertain, heaviness continues to be a sign of prestige.

Differences in social status and the prevalence of obesity have been well-documented in large epidemiological studies (Malina *et al.*, 1983; Stephenson *et al.*, 1987). Women of lower social status are three (Sobal, 1991) to six (Powers, 1988) times more likely to be obese than women of higher social status, regardless of ethnicity. Studies by Allan *et al.* (1993), indicated that black women in the USA of lower social status are heavier, view themselves as heavier, and perceive attractive body size as heavier than black women of higher social status.

According to Powers (1996), studies show that "people in higher socio-economic groups diet more, exercise more, and pay more attention to nutrition. They have the income, the time, and the values to stay thin." According to empirical studies, the media in Western countries have portrayed a thin female body as ideal (Stice & Shaw, 1994). These media messages promote thinness and being slender becomes a goal that women strive to achieve (Myers & Biocca, 1992).

Hesse-Biber (1996) has noted that for women of all socio-economic and ethnic backgrounds overeating is a response to stress. Given that poor women experience

more stress than others, it is no coincidence that obesity is more common in poor women than in those of higher socio-economic status (Powers ,1988).

In a study done by Mvo (1999), it was found that black, overweight South African women of a low socio-economic status also have a positive feedback regarding their attractiveness from significant people in their lives. Although there had been recognition of their weight gain by their peers, this acknowledgment was not associated with any negative social connotations.

2.1.3 Social perception of obesity

Recognizing the fact that cultural preoccupation with thinness has increased, researchers have also been interested in the social perception of obesity. In early research, obesity was conceptualized as a disability and findings consistently revealed that overweight persons were not liked (Matthews & Westie, 1966; Richardson *et al.*, 1961). Maddox *et al.* (1968), designed a semantic differential test and questionnaire to determine attitudes about obesity. To insure generalized results, researchers selected a multi-racial population, with a specific effort to include black respondents since it was believed that they have a more positive feeling towards a higher weight. Results showed that overweight was negatively stereotyped. However, a slight race difference was found: black females who wanted to be heavier themselves were less negative about higher weights. These negative attitudes towards obesity continue to be documented (Cooper & Taylor, 1988; Harris & Smith, 1982; Rucker & Cash, 1992, Thompson *et al.*, 1996).

Body image ideals between self and family have a strong correlation (Mossavar-Rahmani, 1996; Mvo, 1999). These findings reflect the fact that self-perception is a product of socialisation within the family, and that women measure themselves against their family's ideal. Dieting too appears to be closely related to perceptions of one's social group. It has been found that the more inaccurate a women's estimate of body size, the more likely she is to be dieting (Mossavar-Rahmani, 1996). Moreover, the family and male preference may help explain why African American females have more favourable body images, and are less concerned with weight loss and dieting (Cash, 1995). As Thompson *et al.* (1996) point out, self-perceptions of body attractiveness are influenced by the standards of attractiveness held by relevant others.

In most black cultures the health care system seems to have little influence on women's feelings about body size. The most frequently mentioned influence was close friends and family (Allan *et al.*, 1993). In contrast to the white experience of feeling pressure to be thin, black women described feelings influenced by friends and family to maintain a larger body size. They were cautioned not to lose too much weight, or told they looked too thin, or that they looked just fine being heavier. Body size and weight were not frequent topics of conversation among black women (Allan *et al.*, 1993).

As previously mentioned, among black women, obesity is perceived as a condition characterized by increased functional capacity as regards activity. It is not perceived as a risk for future health problems. Dawson (1988) suggested, that black women do not perceive themselves as overweight because they evaluate their body size, not in relation to the white ideal in the media, but in comparison to other black women in their social milieu. The wider normative weight range in black women may foster a different perception of weight.

2.1.4 Perceptions of obesity by overweight individuals

Various studies have indicated that there seems to be a difference in the way that overweight and non-obese people perceive their bodies. More specifically, obese individuals tend to overestimate their size. Wright & Whitehead, (1987) found that obese individuals increasingly overestimated their level of overweight as they lost weight. Some even perceived no loss of weight after significant weight loss. This perceived overweight image was called the " Phantom body size" by the investigators (Wright & Whitehead, 1987). These findings were supported by researchers such as Bruch, (1985) who found significant differences in the psychodynamics of overweight and non-overweight persons. The psychodynamics of obese persons remained constant even after weight loss.

Other investigators (Buch, 1985; Leon, 1982) did not find results that are consistent with the above. According to these researchers body image disturbances are not related to actual size but to a particular population instead. The inconsistency of results are further shown by some investigators who reported that obese individuals tend to underestimate their size in relation to non obese individuals. In general, the relationship between obesity and perception of body size does not seem to be clear. According to Klesges (1983) this relationship warrants further research as body image distortion may actually be a common phenomenon in the general population.

2.1.5 The relationship between body image and weight change behaviour

While investigations (Rucker & Cash, 1992; Thompson *et al.*, 1996) on body image disturbances and social perceptions of obesity have dominated the literature, few have sought to explore and clarify the interaction between body image and weight reduction attempts or success (Jalmeen *et al.,* 1995). Only a few studies could be found which addressed either directly or indirectly the interactive effect that body image may have on weight loss efforts.

Leitner and Grant (1982) studied the relationship between an individual's perceptual understanding of self, on weight related constructs (e.g. overweight versus not overweight) and on actual weight lost. Data revealed that the more respondents perceived themselves to be overweight, the less amount of weight they lost. In a study done by Cash & Pruzinsky (1990), it was found that overweight women, may have a helpless, "what's the use" attitude about fitness and weight reducing diets. Normal-weight people who regard themselves as too heavy may feel more capable of making a difference by losing weight. Believing oneself to be overweight when one is actually normal weight is a cognitive distortion. This distorted belief and associated negative body image are also evident among formerly overweight persons even after successful weight loss (Cash *et al.,* 1995).

Allon (1979) noted that overweight was viewed as an illness but not an individual responsibility. More importantly, she discovered a weight loss trend which was related to age and subjective attitudes and perceptions about the stigma of overweight. In the same study it was found that certain age groups had more difficulty in losing weight than others. She noted that self-blame, self-punishment and guilt were contributing

factors to a negative image and that the intensive focusing upon one's overweight as a major aspect of social interaction may have an influence on weight reduction efforts.

Attempting to further clarify the social psychological factors involved in obesity and factors that could influence weight reduction, other studies (Cash & Pruzinsky, 1990; Abrams *et al.,* 1993) found that body image was significantly correlated with weight loss.

2.1.6 Individual appearance

There is extensive literature dating back to Darwin (1874 cited by Furnham & Baguma, 1994) on cross-cultural differences in the idea of beauty. Although ideas of beauty appear to change over time it has been noted that within any given culture a consensus of opinion and taste prevails regardless of age, ethnic differences, and standards (Kalick, 1987).

According to Smith (1989), a striking finding is the difference between ethnic groups in their investment in appearance. In the USA, black women generally spend more on their appearance than white women. As previously mentioned overweight black women were generally more satisfied with their appearance than white women. Therefore, factors other than body size *per se* might influence black women's overall evaluation of their appearance. Other investigators (Kumanyika *et al.,* 1993; Stevens *et al.*, 1994) have found that black women consider themselves attractive even though they feel dissatisfied with their body size.

Throughout history, black women in Western Society have confronted two often conflicting standards of beauty. One standard suggested by the majority white culture

and one consistent with African American heritage. Okazawa-Rey *et al.*, (1987) argued that the African American women are twice victimized because they must respond to the desires and expectations of their own culture and to white cultural values and norms.

During slavery in the United States, blacks often received preferential treatment if they had Cuacasoid features such as light skin and straight hair (e.g. Hughes & Hertel, 1990; Neal & Wilson, 1989). After slavery was abolished, individuals with Cuacasoid features received acceptance into more affluent African American organised clubs and had more employment opportunities (Grier & Cobb, 1968 sited by Jalmeen, *et al.*, 1995; Okazawa-Rey *et al.,* 1987). This left many blacks incapable of reaching positions of higher status, and reinforced the importance of adherence to the White standard of beauty (Gatewood, 1988). Bond and Cash (1992), reported that lighter skin was considered more attractive than darker skin among many black women and most black women believed that black men found lighter skin to be more attractive (Hughes & Hertel, 1990; Neal & Wilson, 1989). The consequences of striving towards an unrealistic appearance standard were potentially devastating, resulting in feelings of low self-worth and potentially greater risk of eating disorders (Brownell, 1991; Hsu, 1987; Rosen *et al.*, 1991).

2.1. 7 Perception of health as related to body size

According to Allan *et al.* (1993) overweight black women do not view themselves at greater risk for hypertension because of their weight, but rather because of their consumption of the " Southern Diet" of high fat and high salt foods. The term "healthy" is associated with stamina, attractiveness, and being well-nourished, or a woman who "can handle the rough times better." In this study, health and slenderness were not linked together by most black women, even though the vast majority (67.7 %) selected a thin

body size as healthy (Allan *et al.*, 1993). In the same study the majority of black and white informants described extreme thinness as unhealthy. The majority of black women also stated that heaviness was a problem only if one was limited in carrying out daily activities.

Researchers (Root, 1990; Hsu, 1987) have suggested that the cultural milieu of African Americans offer "protective factors" against the development of eating disorders. Such factors include family and community appreciation of a fuller and physiologically healthier body size (Parker *et al.*, 1995). There has been some concern, however, that increased affluence of white cultures may result in higher incidence of eating disorders as African Americans seek to emulate white middle class ideals (Hsu, 1987).

In contrast to African Americans, weight has been identified as an important health concern, source of psychological stress, and measure of self-esteem among White American females (Molefi, 1988). Results of recent nationwide surveys have revealed that White and Hispanic girls perceived themselves to be overweight even when their weight for height fell within "normal" parameters as established by the National Center for Health Statistics. By comparison, African American adolescent females were found to be less likely to perceive themselves as overweight (Desmond *et al.*, 1989).

2.2 Attitude towards weight control

Traditional definitions (Allport, 1935 as cited by Robins, 1990) proposed that "an attitude is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related". In contrast, Krech and Cruthchfield (1948 as sited by Robins, 1990) defined an attitude as " an enduring organization of motivational, emotional,

perceptual, and cognitive processes with respect to some aspect of the individual's world". Today, the most common definition combines elements from both approaches. Attitude consists of three different components: a cognitive, affective and behavioral component (Sears *et al.*, 1991:141).

The cognitive component consists of all the thoughts the person has about a particular object, fact, knowledge and belief. One example for instance is the evaluation (cognitive) which a person makes with regard to their body shape or size. This component is largely related to perception. A person might for instance be overweight but still evaluate her/himself as normal in terms of body size.

The affective component consists of all the person's affects or emotions towards the object, specifically positive or negative. A person might for instance be overweight, realizes it on a cognitive level, but still has positive feelings about his/her body.

The behavioral component consists of the person's readiness to respond or his tendency to act regarding the object. An example of this component would be where a person perceives him or herself as overweight (cognitive component), feels negative about being overweight, and then goes on a weight-reducing diet. This change in eating behavior would represent the behavioral component.

The importance of all these components is evident. Apart from the fact that they are interrelated, behaviour is dependent on how a person feels towards something and this in turn affects how they view or perceive it. This implies that a lot can be learned about someone's feelings and perceptions related to something by watching their behaviour.

When determining people's attitude towards weight control, a good indicator would be to watch their eating behaviour and determine their anthropometrical status. This is especially true when cross-cultural differences want to be determined. Some studies (Serdula *et al.,* 1993) have shown that similar proportions of white (38.4 %) and black American women (38.6 %) reported current dieting to lose weight. Weight reduction was shown to be less effective for overweight black women, perhaps because cultural factors foster more positive body images and self-evaluation among these women (Abrams *et al.,*1993; Kumanyika *et al.*, 1993; Kumanyika, 1994; Wilson *et al.,* 1994).

Understanding body image concerns and satisfaction with body shape and weight in black and white adults is challenging because of several factors. Perceptions of one's own body as too large or too small may reflect an attitude towards obesity and may be related to dieting behaviour. Positive attitudes are also associated with less concern with body weight (Rosen & Gross, 1987).

Several authors (Brown, 1985; McBride, 1988; Woods, 1991) have called for a paradigm shift in the approach to weight and weight-related health interventions. This new paradigm involves challenging beliefs, for example, that being slightly overweight is unhealthy or that losing weight is a matter of willpower.

In the general population negative attitudes towards obese persons exist for children as young as age six, and are even more pronounced regarding women, adolescent girls, and the morbidly obese (Wadden *et al.*, 1988; Sobal, 1991; Rittenbaugh, 1982). Obese adults have been found to have lower physical self-concepts than normal weight women, but some studies have indicated that they do not differ from others significantly in terms of overall self-concept (Jacobs & Wagner, 1984). Other studies have reported that

obese adult females see themselves as lonelier than normal weight women (Schumaker *et al.*, 1985). Girls and women have shown a greater tendency towards negative reactions to their own bodies than have boys and men and are more likely to have distorted perceptions of their weight (Offer *et al.*, 1981; Worsley, 1981). Underweight women often perceive themselves as normal weight while normal weight adolescents and women often perceive themselves as overweight (O-Rourke *et al.*, 1984). Moreover, the more inaccurate the perception, the worse women feel about themselves (Thompson *et al.*, 1996).

2.3 Methods used to assess body image and attitudes.

Various instruments have been used for the assessment of body image. These include projective techniques (Fisher & Cleveland, 1958), drawings of the body (Tait & Ascher, 1955), schematic representations of body parts (Katcher & Levin, 1955), the aniseikonic lens technique (Wittreich, 1953), questionnaires (Secord, 1953), life size markings of body dimensions (Askevorld, 1975), estimations using calipers (Reitman & Cleveland, 1964), and the distorting photograph technique (Glucksman & Hirsch, 1969; Craig & Caterson, 1991).

Another form of assessing body image is The Figure Rating Scale, an instrument which includes nine schematic figures of women and men, ranging from underweight to overweight (Stunkard & Sorensen., 1983). The Figure Rating Scale is one of the most widely used assessment devices in body image research (Fallon & Rozin, 1985; Rozin & Fallon, 1988, Thompson, 1995) and has excellent psychometric characteristics (Thompson & Altabe, 1991).

In South Africa Kruger *et al.* (1996) developed a reliable attitude scale according to the combined Thurstone-, Likert- and Guttman-method as described by Edwards and Kilpatrick (1948). Nel (1978) investigated the merit of this method and came to the conclusion that it is one of the best methods for developing an attitude scale. The 21-item attitude scale of Kruger *et al.* (1996) has been developed specifically for the measurement of body image of South African black women.

Recently a visual tool (photographs) has been developed by Slabber *et al.* (submitted for publication) to provide information on body image of black South African Women. The distorting photograph technique (Massara, 1979) was modified and a graded set of photographs was developed, specifically to provide information on body size perceptions of black South African women.

2.4 Summary

In this chapter the psychological construct of body image as part of a person's perceptual framework about the self and more specifically the way people experience their bodies are defined.

The factors affecting the way a person sees her or his body have been discussed. These factors range across multi-disciplinary approaches including sociology, cultural and psychological influences. The factors that have a sociological nature include socio-economic, status and social perception. Psychological variables discussed include attitude towards weight change behaviour. Perception with regard to health, obesity and individual appearance are also included.

CHAPTER 3

Methods

3.1 Introduction

In this chapter the specific apparatus, techniques, test sample and procedures used for the study are discussed. The methods for statistical analysis of the data are also included.

This study formed part of a larger epidemiology study investigating nutritional health of black women in Mangaung. This sub-study investigated the relationship between anthropometry, body image and attitude towards weight control. The role of this study in the larger study will be put into context. Fig 3.1 represents the variables that were measured in the larger study. As part of the larger study other researchers investigated the socio-demographic status, dietary intake, activity levels, iron status, HIV status and cancer risk of women in Mangaung. The researcher was specifically responsible for determining body image, attitude towards weight control as well as anthropometry of the sample.

To determine body image a series of five standardised photographs developed by Slabber *et al.* (2003) combined with a body image questionnaire were administered. To measure the respondent's attitude towards weight control a questionnaire (Kruger *et al.*, 1996) was administered.

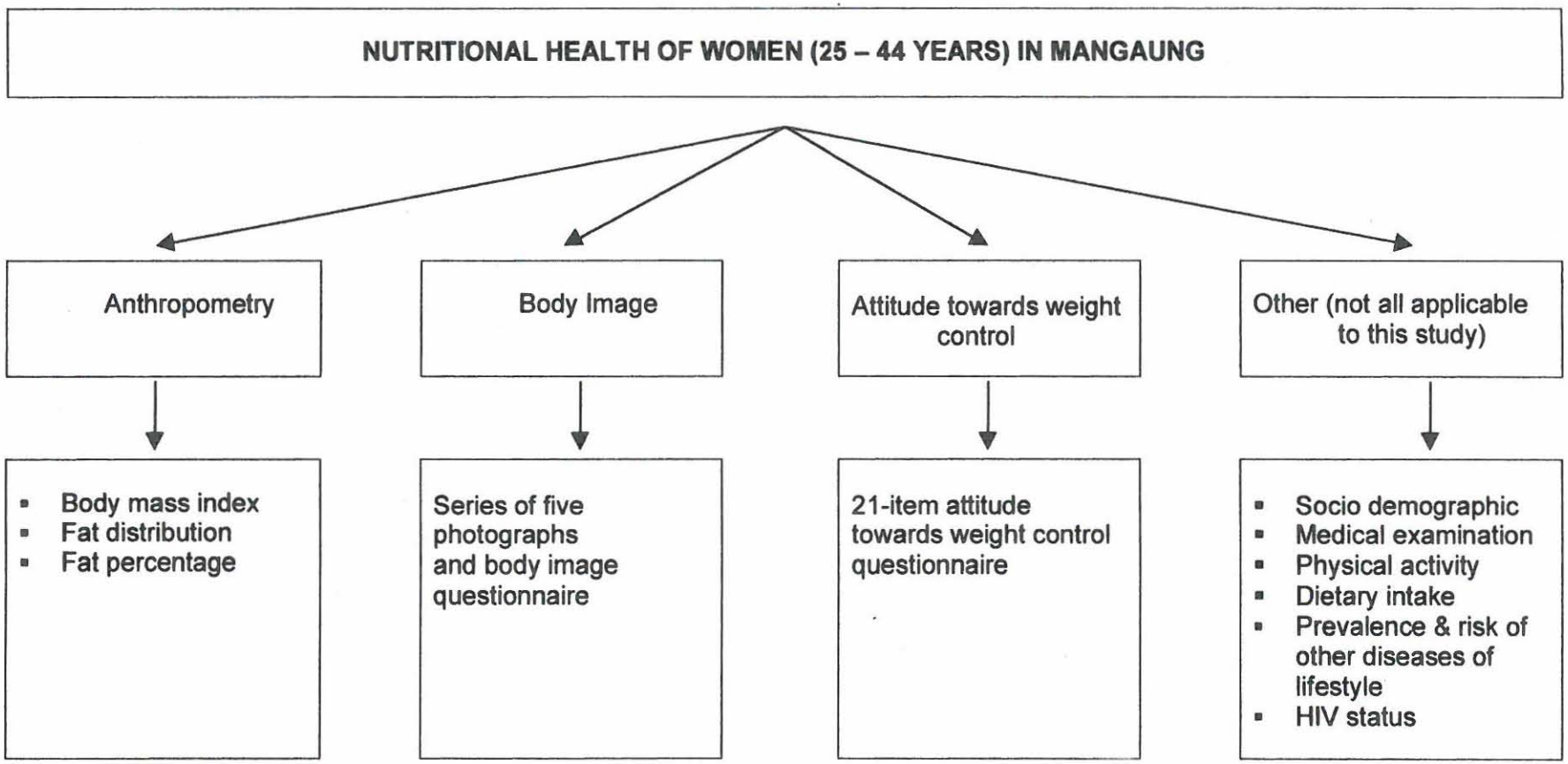


Figure 3.1: Study Framework to determine the nutritional health of black women (25-44 years) in Mangaung.

3.2 Operational definitions

Operational terms are defined as follows:

3.2.1 Anthropometry

Anthropometry involves obtaining physical measurements of an individual, and relating these measurements to standards that reflect the health and nutritional status of the subject (Lee & Nieman, 1996,p. 224; Hammond, 2000,p. 368). For the purpose of this study, BMI, Waist-hip-ratio and fat percentage was measured and were defined as follows.

3.2.1.1 Body mass index (BMI)

Body mass index (mass/length**2) was calculated by using the Quetelet Index and were categorised as follows (Slabber *et al.*, 2003):

Underweight BMI:	<18.5 (kg/m^2);
Lower normal weight BMI:	18.5<20(kg/m^2);
Normal BMI:	20<25(kg/m^2);
Overweight BMI:	25<30(kg/m^2);
Obese BMI:	≥30(kg/m^2).

3.2.1.2 Waist-hip-ratio (WHR)

Waist-hip-ratio refers to the ratio of the waist circumference and the hip circumference. Cut-off points used for this study were a waist-hip circumference ratio of ≥0.8 in the African women, indicating an android fat distribution, and a waist-hip-ratio of <0.8, indicating a gynoid fat distribution (Hammond, 2000:372).

3.2.1.3 Fat percentage

Fat percentage refers to the percentage of fat tissue in the body as measured by bio-impedance. Fat percentage between 20 & 25% was considered appropriate (Lee & Nieman, 1996:146).

3.2.2 Body image

For the purposes of this study body image refers to the opinions and views that the respondents showed regarding the series of five photographs developed by Slabber, *et al.* (2003) in Appendix A.

3.2.3 Attitude towards weight control

Attitude refers to one's beliefs and perceptions of statements related to weight control and how people behave with regard to these beliefs and perceptions.

3.2.4 Lifetime spent in an urban area

Lifetime spent in an urban area refers to the percentage of a respondent's total lifetime spent living in an urban area.

3.3 Choice and standardization of apparatus and techniques

All apparatus, techniques and procedures used in the study were standardized prior to its implementation. Methods were standardized to ensure validity and reliability.

3.3.1 Anthropometric measurements

The following apparatus were used for the anthropometric measurements. All apparatus used were calibrated prior to the study.

3.3.1.1 Digital electronic scale

The 770Seca digital electronic scale (Bizerba, 75860) was used for weighing the subjects. All subjects were weighed to the nearest 0.1kg.

3.3.1.2 Stadiometer

A stadiometer was used to determine the height of the subjects. The stadiometer consists of a light metal frame that is mounted on a stand with a right-angle headboard that can be moved up and down. The stadiometer can measure up to two meters.

3.3.1.3 Measuring tape

A measuring tape was used to measure the waist and hip circumferences. The use of a steel measuring tape is required because a measuring tape made of linen can stretch and give a false value (Lee & Nieman, 1996:245).

3.3.1.4 Bodystat

For the aim of this study die Bodystat® 1500MDD was used to determine body fat percentage via bio-impedance. The Bodystat® 1500MDD works by passing a safe, current through the body and measuring impedance at 50 kHz. The current is harmless and cannot be felt by the subject. The body's resistance to the current is measured by this instrument and body fat, lean body mass, dry lean mass and total body water are predicted.

3.3.2 Body image

3.3.2.1 Photographs

For the purpose of this study body image was determined by means of a series of five photographs based on the distorting photograph technique developed by Slabber *et al.* (2003) (Appendic C).

3.3.3 Attitude towards weight control

3.3.3.1 Questionnaire

The 21-item attitude scale developed by Kruger (Kruger *et al.*, 1996) was used to determine the subjects' attitude towards weight control during individual interviews. The above mentioned tool was also developed specifically to measure body image of black South African women (Appendix D).

3.4 Measuring techniques and procedures

All the measuring techniques were implemented according to standardised methods and are discussed in the following paragraphs.

3.4.1 Anthropometric measurements (Appendix B)

The researcher, who is a qualified anthropometrist, performed all anthropometrical measurements. Measurements were done according to standardised methods and procedures (Lee & Nieman, 1996:245). These measurements were performed after an overnight fast. Subjects did not exercise for 12 hours, consume alcohol or caffeine for 24 hours prior to measurements (Bodystat R1500 - Bodystat, Isle of Man, Limited). To determine the anthropometric status of the subjects, weight, height, waist and hip circumferences and bio-impedance were measured. For anthropometric measurement subjects were examined in an examination gown.

3.4.1.1 Weight

Weight was determined using a digital electronic scale to the nearest 0.1kg (Lee & Niemann, 1996:229). The subject stands still in the middle of the scale's platform with the body weight equally distributed on both feet.

3.4.1.2 Height

Height was determined by using a stadiometer to the nearest 0.5cm. Subjects were without shoes, standing upright against a flat surface, with the head in the Frankfort plane for height measurements. The headboard was then lowered upon the highest point of the head and the measurement was then read on eye level (Lee & Nieman, 1996:225-226).

3.4.1.3 Waist and hip circumferences

Waist and hip circumferences were determined with the subject standing erect, arms at the sides and feet together. The waist circumference was measured at the midpoint between the lower rib margin and the iliac crest, and the hip measurement at the maximal circumference of the buttock with a 7-mm wide flexible plastic tape. Circumferences were measured using the cross-hand technique with the tape at right angles to the body segment, which was being measured, and with no indentation of the skin (Lee & Nieman, 1996:245).

3.4.1.4 Fat percentage

Fat percentage was determined by bio-impedance and the following procedures were followed:

Elbow width was necessary for bio-impedance. It was determined using a slide ruler to the nearest 0.1 mm. The respondent stretched out the right arm, palm up and brought up the lower arm to a vertical position. The width between the protruding condiles of the elbow was measured with the slide ruler and the reading was recorded.

Subjects lay relaxed and flat on an examination bed, with the arms and legs slightly spread, but with no parts of the body touching one another. The self-adhesive disposable electrodes were attached to the right hand and the right foot. One red lead was placed behind the knuckle of the middle finger of the right hand. One black lead was placed on the wrist next to the ulna head of the right hand. The other red lead was placed behind the second toe next to the big of the right foot. The other black lead was placed on the ankle at the level of, and between the medial and lateral malleoli of the right foot. The machine was switched on, and when the reading had stabilised, the impedance reading was recorded (Bodystat *R*1500 Bodystat, Isle of Man, Limited).

3.4.2 Body image (Appendix C)

Body image was determined by using a series of five photographs, standardised according to five calculated BMI categories (see 3.2.1.1). These photographs were then placed randomly on eye-level and the subjects were interviewed by the researcher according to a structured standardised questionnaire based on these photographs.

The questionnaire consisted out of two parts. In the first part of the questionnaire the respondents had to answer questions on how they perceived healthy, attractive, overweight, normal weight and underweight persons, according to the five photographs shown to them. In the second part of the questionnaire the respondents had to answer questions about their view of how the community will react towards an overweight and underweight person.

3.4.3 Attitude towards weight control (Appendix D)

The 21-item attitude scale developed by Kruger (Kruger *et al.*, 1996) was used to determine the subjects' attitude towards weight control in interviews with each subject. Subjects had to answer questions concerning what they thought the family and friends' attitude were towards fat and thin people, feeling and emotional related questions, food- and exercise related questions. The subjects had a choice of three answers to each question namely: agree, do not agree and uncertain.

3.4.4 Percentage lifetime spent in an urban area (Appendix E: Socio-Demografic Questionnaire)

- The number of years living in an urban area was determined in the socio-demographic questionnaire.
- The age of the respondent on the day of the interview was also noted on the socio-demographic questionnaire.
- These 2 parameters were used to calculate the % lifetime spent in an urban area.

Percentage lifetime spent in an urban area was categorised as follows (Bourne *et al.*, 1993):

- < 20 % lifetime
- 21< 50 % lifetime
- 51 < 80 % lifetime
- >81 % lifetime

3.5 Validity and reliability

Validity of an instrument is an assurance that it measures what it is intended to measure. (Compton & Hall, 1974, p202). Reliability refers to the consistency of the instrument results when re-applied to the same individual (Compton & Hall, 1974, p204; Monsen & Cheney, 1992, p13).

3.5.1 Anthropometry

All measurements were determined in accordance with published recommendations (Lee & Nieman,1996, 225, 228-229, 244-245, 272-273) Bodystat R1500 Bodystat, Isle of Man, Limited) to ensure reliability of anthropometric results. Fever, electrolyte imbalance, obesity or hydration status of the patient may influence the reliability of measurements (Hammond, 2000:373). Dehydration due to insufficient water intake, excessive perspiration, heavy exercise or caffeine or alcohol use will result in overestimation of fat mass. To prevent this, subjects are to reframe from consuming caffeine and alcohol the day before testing, and avoid heavy exercise 12 hours before testing. BIA is a practical method for large demographic studies in comparison with other methods such as underwater weighing. BIA was shown to be as good as skinfold

measurements in prediction percent body fat. This method is safe, convenient to use, portable, rapid and noninvasive.

3.5.2 Body image

To evaluate reliability of the results, the questionnaire to determine body image was tested again on ten percent (49 women) in the original sample. The re-evaluation took place after one to four weeks after the first interview. One woman was excluded due to age.

3.5.3 Attitude towards weight control

As with the questionnaire to determine body image, the attitude towards weight control questionnaire was also re-tested on ten percent (49 women) in the original sample. Approximately ten percent op the sample was interviewed again between one and four weeks after completion of the interviews. For each question the answers obtained in the main survey were compared with those in the reliability survey. If the percentage of conflicting answers exceeded twenty percent, the question was considered unreliable and the question was then eliminated.

3.6 Population and sampling

3.6.1 Target population

This study was conducted in the Mangaung area of Bloemfontein. Mangaung is an area in the Free State where changes in diet and activity patterns have most likely occurred

due to urbanisation and westernisation. This makes Mangaung an ideal area to study body image and attitude towards weight control.

3.6.2 The sample size

A random sample of 500 Black pre-menopausal African women, in the Mangaung area of Bloemfontein, from two age groups of 25-34 and 35-44 years were selected by the Department of Bio-statistics, Faculty of Health Sciences, University of the Free State. A township map, obtained from the Greater Bloemfontein municipality, was used to make the selection. A sample of 500 women has been estimated to be representative of the whole Mangaung area. The age group categories had been selected in accordance with the categories selected for other studies undertaken in South Africa to make comparison of results possible. Women were post-pubertal and pre-menopausal and were selected out of two informal settlements namely Joe Slovo (1 359 plots) and Namibia (2 995 plots) and two formal settlements namely Phahameng (1 711plots) and Botschabela (2 308 plots). These plots were counted, numbered and 500 respondents were then selected proportionally and randomly.

3.6.3 Inclusion criteria

- Persons took part in the research study voluntarily;
- African female;
- Age group 25-44;
- Non-pregnant

3.7 Pilot study

A pilot study was undertaken in order to standardise the questionnaires, to make certain that terminology were clearly understood and to indicate the number of subjects who could be handled during one session. The body image and the attitude towards weight control questionnaires were pre-tested on a group of twenty black pre-menopausal women who were not part of the selected sample. In the pilot study it was determined that the photographs should be placed in random order to ensure that the respondents did not always choose the first photograph as the most underweight and the last photograph as the most obese.

3.8 Ethical approval

The Ethics Committee of the Faculty Health Sciences, University of the Free State, approved the study (Etovs, ref. Nr.02/00).

3.9 Implementation of the study

3.9.1 Study design

Prior to the study, a letter of approval was sent to the Community leaders in Mangaung, explaining the purpose and extent of the study (Appendix F). Four areas in Mangaung, namely, Joe Slov, Namibia, Phahameng and Botschabela were selected and two community health workers addressed a community meeting in each of the four areas. During these meetings the purpose and procedures of the study were explained to the

community. The researchers aimed to establish confidence and goodwill in the community towards the study. Members of the community were also given an opportunity to ask relevant questions. The study leader was also interviewed on a local radio station in an attempt to inform the local community about the study.

With the assistance of a biostatistician, study sites were randomly selected from the four geographical areas. Two community health workers were given detailed instructions in the recruitment of subjects as well as a map of twenty of the randomly selected plots on a weekly basis. On arrival at the plot the inhabitants were screened to determine if any of them conformed to the requirements for inclusion in the study. If no one on the selected plot conformed to these requirements, the community health worker moved to the residence situated to the left of the original selected residence. If still unsuccessful, they approached the residence situated to the right. If none of the three plots had any inhabitants that conformed to the inclusion requirements, the biostatistician selected a new plot.

The community health workers explained the purpose and procedure of the project to the selected subjects in their home language. They also explained the inclusion criteria after which written consent was obtained from all participants (Appendix G). One day per week for the period of 25 weeks, 20 subjects were transported in a mini bus, from a central point in the community to the research unit at Technikon Free State where all investigations were undertaken. Community health workers and subjects received remuneration to participate in the study.

All the subjects were issued with a nametag with their respondent number and a list of all the stations they had to visit. A medical examination was done, anthropometrical

measurements determined and blood samples were taken after which respondents were given tea and sandwiches. Questionnaires were administered after tea. Three translators (two Sotho and one Xhosa) were utilised to facilitate effective communication. A research assistant co-ordinated the procedures to ensure that each subject visited all of the stations. The stations were the following:

- Medical examination by a medical practitioner;
- Blood sampling;
- Anthropometric measurements;
- Photographs and body image questionnaire;
- Attitude towards weight control questionnaire;
- Other questionnaires not applicable to this study were administered.

3.10 Statistical analysis

The data were categorised into two age groups: 25 - 35 years and 35 - 44 years. For each group continuous variables were described by means and standard deviations or medians and percentiles as applicable. Frequencies and percentages described categorical variables.

3.10.1 Anthropometry

Body mass index, waist-hip-ratio and fat percentage were calculated and categorised according to the cut-off points discussed under 3.2.1. Frequencies and percentages described the categorised variables.

3.10.2 Body image and attitude towards weight control

Frequencies and percentages described the categorised variables.

3.10.3 Associations

Percentage lifetime spent in an urban area was calculated. For each age group the categorised variables were described by frequencies and percentages and the association between BMI and body image questions were calculated by kxk tables. To determine whether age is associated with attitude, 2x3 tables of age categories and attitude variables were constructed and the percentages of respondents who agreed to the answers were compared by Jefreys-Perks confidence intervals for the difference between independent percentages (Newcombe, 1998).

The association between percentage lifetime spent in an urban area and body image questions were calculated by kxk tables.

3.11 Summary

The aim of this study was to determine the relationship between anthropometry, body image and the attitude towards weight control of women in Mangaung. A sample of 500 pre-menopausal African women, in this area (age 25-44) was randomly selected for this study.

Body image of the respondents was determined by means of a series of five photographs, which were standardised according to five calculated BMI categories and was accompanied by a questionnaire.

Attitude towards weight control of the respondents was determined by means of a 21-item attitude scale were the subjects had to answer emotional-, food and exercise related questions.

Anthropometric measurements included BMI, fat percentage and waist-hip-ratio.

Associations between body image and BMI as well as body image and percentage lifetime spent in an urban area were determined.

CHAPTER 4

Results

4.1 Introduction

The results obtained from the anthropometric measurements, body image- and attitude towards weight control questionnaires as well as the associations between body image and percentage lifetime spent in an urban area are presented in this chapter. Furthermore the relationships between anthropometrical status and attitude towards weight control, and attitude towards weight control and percentage lifetime spent in an urban area are also presented in this chapter.

4.2 Distribution of age group

Initially it was planned that an equal number of women (250 younger and 250 older women) would be included in the study. This objective was not met. The age that the respondents indicated to the community health workers, who were involved in contacting the respondents, and the actual age according to their identification documents differed. The younger sample thus consisted of 279 women, and the older sample consisted of 217 women. Four subjects were found to be pregnant during the medical examination, and could not be included in the study.

4.3 Anthropometry

4.3.1 BMI of younger and older women

Table 4.1 shows the BMI of the younger (25 - < 35 years) and older women (≥ 35 - 44 years).

Table 4.1: Body mass index

BMI CATEGORY	25 - <35 YEARS N = 279		≥ 35 - 44 YEARS N = 217	
	n	%	n	%
< 18.5 (kg/m^2)	7	2.51	9	4.15
≥ 18.5 < 20 (kg/m^2)	14	5.02	17	7.83
20 < 25 (kg/m^2)	109	39.07	79	36.41
25 <30 (kg/m^2)	84	30.11	60	27.65
≥ 30 (kg/m^2)	65	23.30	52	23.96

The BMI of a large percentage of the subjects fell in the category 20 < 25 indicating normal weight (39.07% .of younger group and 36.41% of older group). A large percentage of subjects in both groups were overweight (30.11% and 27.65% respectively) or obese (23.30% and 23.96% respectively). The scores for the two age groups were distributed quite similarly. Both groups share the characteristic of most subjects falling in the overweight and obese BMI categories.

4.3.2 Fat distribution of younger and older women

Table 4.2 shows the fat distribution of younger and older women.

Table 4.2: Fat distribution

	25 - <35 YEARS N = 279		≥35 - 44 YEARS N = 217	
	n	%	n	%
<0.8 (gynoid)	233	83.5	136	62.7
≥ 0.8 (android)	46	16.5	81	37.3

The majority of women in both age groups had a gynoid fat distribution (83.5% in younger group and 62.7% in older group). Noteworthy is the difference in fat distribution between the two groups, with a greater percentage of older women in the android group (37.3%) than the younger group (16.5%). The mean fat percentage of women were 36.6 percent and 39 percent for younger and older women respectively.

4.3.3 Fat percentages of younger and older women

The majority of subjects (92.47% and 94.01% for the younger and older groups respectively) had an high fat percentage (>25%). The mean fat percentage was 66.6 for the younger- and 38.5 for the older women respectively. This phenomena also varies very little across age groups.

The fat percentages of the two age groups is represented in Table 4.3.

Table 4.3: Fat percentage

FAT %	25 - <35 YEARS N = 279 n	%	≥ 35 - 44 YEARS N = 217 N	%
Low (<20%)	3	1.08	3	1.38
Appropriate (20 < 25%)	18	6.45	10	4.61
High (>25%)	258	92.47	204	94.01

4.4 Body image

The body image of the women were determined by means of a questionnaire. The validity, reliability and the results are given in the attached article (Appendix A).

4.4.1 Validity and reliability of body image

The validity and reliability of the photographs depicting different BMI categories are discussed in the attached article (Appendix A).

4.4.2 Main study: Body image

Responses of the sample to questions related to body image of the women in the two age groups are given in Table 4.4.

Table 4.4: Body Image

BMI CATEGORY	25 - <35 YEARS N = 278		≥ 35 - 44 YEARS N = 217	
	n	%	n	%
1. Which person looks the healthiest?				
Underweight	27	9.71	21	9.68
Lower normal weight	64	23.02	62	28.57
Normal weight	48	17.27	21	9.68
Overweight	87	31.29	63	29.03
Obese	52	18.71	50	23.04
2. Which person's body is the most attractive?				
Underweight	21	7.55	25	11.52
Lower normal weight	81	29.14	67	30.88
Normal weight	69	24.82	39	17.97
Overweight	75	26.98	60	27.65
Obese	32	11.51	26	11.98
3. Which person looks overweight?				
Underweight	1	0.36	0	0.00
Lower normal weight	5	1.80	2	0.92
Normal weight	5	1.80	5	2.30
Overweight	22	7.91	19	8.76
Obese	245	88.13	191	88.02
4. Which person looks acceptable (normal weight)?				
Underweight	44	15.83	26	11.98
Lower normal weight	62	22.30	73	33.64
Normal weight	87	31.29	50	23.04
Overweight	79	28.42	66	30.41
Obese	6	2.16	2	0.92
5. Which person looks underweight?				
Underweight	236	84.89	198	91.24
Lower normal weight	27	9.71	14	6.45
Normal weight	6	2.16	3	1.38
Overweight	9	3.24	2	0.92
Obese	0	0	0	0

When asked, " Which person looks the healthiest?" 28.57% of respondents in the older group chose the photo depicting a BMI of ≥ 18.5 to < 20, which indicates the lower range of normal weight. The largest percentage of respondents in both age groups chose the photo depicting overweight (31,29% and 29,03% respectively) to be the healthiest.

When the respondents had to choose the most attractive body image, 29.14% of the younger women and 30.88% of the older women chose the photo depicting the range of lower normal weight (BMI of ≥18.5 < 20). In addition, 24.82% and 26.98% of the younger women also chose a BMI of 20 < 25 (normal weight) and 25 < 30 (overweight) respectively. In the older group 27.65% of the women chose the photo depicting overweight as the most attractive. Very few (7.55% of younger and 11.52% of older women) chose the underweight photo as most attractive. The majority of the respondents in both the younger and older groups chose the photo depicting an obese body image (BMI ≥ 30) as a person looking overweight (88.13 and 88.02 respectively). The same was found when asked, "which person looks underweight?", where 84.89% and 91.24% of the younger and older women chose a BMI <18.5.

When asked, " Which person looks acceptable" the largest percentage of respondents in the younger group (31.29%) chose normal weight, while 33.64% of the older group chose the range of lower normal weight. A high percentage (22.30%) of the younger group also chose lower normal weight (22.30%) and overweight (28.42%) while the older group chose normal weight (23.04%) and overweight (30.41%). It is interesting to note that more women indicated that overweight bodies are healthy but that the range of lower normal weight is more attractive. This implies that health and attractiveness of bodies are not always viewed as parallels. It must also be noted that the overweight body size was also viewed as attractive by many women.

Table 4.5 shows the perception that the women had towards the body size representing obesity.

Table 4.5: The reaction of the community towards an obese person.

BMI CATEGORY	25 - <35 YEARS N = 278		≥ 35 - 44 YEARS N = 217	
	n	%	n	%
6. What is the reaction of your community towards an obese (BMI ≥30) person?				
Think they are rich.				
YES	133	47.84	108	49.77
NO	145	52.16	109	50.23
Think they are healthy.				
YES	153	55.04	109	50.23
NO	125	44.96	108	49.77
Think they are attractive.				
YES	110	39.57	91	41.94
NO	168	60.43	126	58.06
Think they are the same as other people.				
YES	110	39.57	104	47.93
NO	168	60.43	113	52.07

Respondents were asked to indicate how their community viewed obese people. When asked whether the community viewed an obese person as rich or not, 47,84% of the younger women said that obese people are viewed as rich while 52.16% disagreed. For older women this differences were smaller (49.77% and 50.23% respectively). Most young women (55.04%) thought that obese people are healthy. As far as obesity and attractiveness are concerned, most women in the younger group (60.43%) and older group (58.06%) viewed obese persons as less attractive in the eyes of the community. The percentage of young women that considered the community to view obese people the same as other people was the same as those that viewed obese persons as attractive (39.57%).

Table 4.6: The reaction of the community towards an underweight person.

BMI CATEGORY	25 - <35 YEARS N = 278		≥ 35 - 44 YEARS N = 217	
	n	%	n	%
7. What is the reaction of your community towards an underweight (BMI < 18.5) person?				
Think they are rich.				
YES	47	16.91	50	23.04
NO	213	83.09	167	76.96
Think they are healthy.				
YES	106	38.13	70	32.26
NO	172	61.87	147	67.74
Think they are attractive.				
YES	106	38.13	73	33.64
NO	172	61.87	168	66.36
Think they are the same as other people.				
YES	128	46.04	101	46.54
NO	150	53.96	116	53.46

The same questions were asked about the body size representing underweight. When asked whether the community views thin people as rich, the vast majority of younger women (83.09%) and older women (76.96%) responded that the community viewed thin persons not to be rich.

The majority of respondents also indicated that the underweight body size is considered healthy (61.87% of younger women and 67.74% of older women). Underweight is also considered to be less attractive. This was the view expressed by 61.87% of the younger group and 66.36% of the older group. These results correspond well with those of table 4 where they had to choose the photo that depicted the most attractive body. Very few (7.55% of younger women and 11.52% of older women) felt that the photo depicting underweight was most attractive (Table 4.6).

4.5 Attitude towards weight control

4.5.1 Validity and reliability of attitude towards weight control

The attitude towards weight control questionnaire was validated by Kruger *et al.* (1996).

The reliability of the questions (Table 4.7) were determined by repeating the questionnaire in 50 women. One woman was excluded due to age and the information of 49 women could be used.

Table 4.7: Reliability of attitude towards weight control questions for 49 women.

QUESTIONS	%DIFFERING
1. Fat people have more friends.	24.5
2. Children do not like fat mothers.	30.6
3. The clothes of fat people do not fit well.	4.1
4. Fat people cannot work hard.	14.3
5. Fat people are people who eat too much.	16.3
6. Thin women get jobs easier.	12.2
7. Foods for reducing diets are cheaper.	22
8. Thin people can wear more fashionable clothes.	12.3
9. Thin women are beautiful.	6.1
10. When one eats less to lose weight, one feels hungry all day.	18.4
11. Men prefer fat women.	18.4
12. Foods for reducing diets are tasty.	22.5
13. Fat people feel unhappy.	18.4
14. People who eat healthy foods, are thin.	20.4
15. If one exercises daily, one feels healthy	8.2
16. When one eats less to lose weight, one always wants to eat something tasty.	34.7
17. It is difficult to lose weight.	6.2
18. Fat women are well cared-for by their husbands.	14.3
19. If one loses weight, one feels proud.	18.4
20. I enjoy bodily exercise.	4.1
21. If one loses weight, one looks unattractive with loose skin.	28.5

For each question, the answers obtained in both surveys were compared and where the percentage of conflicting answers exceeded twenty percent, the reliability of the answers to the question was considered uncertain and the question was then eliminated. The results of six questions in the questionnaire were not reliable and were not used in the study. The researcher suspects that the reliability on the questions "Fat people have more friends" and "Children do not like fat mothers" are low because the respondents manipulated their responses to be in line with what they believed the perception of the researcher would be. Various respondents were not acquainted with the concepts of diet and health foods therefore questions 12, 14 and 16 also led to unreliable responses. The question " If one loses weight, one looks unattractive with loose skin" was unreliable, possibly due to the fact that the respondents did not understand the term "loose skin".

4.5.2 Main study: Attitude towards weight control

The results of the attitude towards weight control questionnaire are shown in Table 4.8. Where significant differences between the percentage of younger and older women that agreed were found, these are indicated by the percentage difference and the CI.

Table 4.8 shows the attitude towards weight control

Table 4.8: Attitude towards weight control.

QUESTIONS	25 - <35 YEARS N = 279		≥ 35- 44 YEARS N = 217		% Difference *
	n	%	n	%	C I
The clothes of fat people do not fit well.					
AGREE	213	76.34	177	81.57	-
DO NOT AGREE	60	21.51	36	16.59	
UNCERTAIN	6	2.15	4	1.84	
Fat people cannot work hard.					-
AGREE	214	76.70	157	72.35	
DO NOT AGREE	64	22.94	58	26.73	
UNCERTAIN	1	0.36	2	0.92	
Fat people are people who eat too much.					
AGREE	180 *	64.52	167*	76.96	12.4
DO NOT AGREE	86	30.82	41	18.89	(4.4;20.2)
UNCERTAIN	13	4.66	9	4.15	
Thin women get jobs easier.					
AGREE	202*	72.40	182*	83.87	11.4
DO NOT AGREE	69	24.73	28	12.29	(4.2;18.4)
UNCERTAIN	8	2.87	7	3.23	
Thin women are beautiful.					
AGREE	215*	77.06	187*	86.18	9.2
DO NOT AGREE	60	21.51	24	11.06	(2.2;15.8)
UNCERTAIN	4	1.43	6	2.76	

QUESTIONS	25-<35 YEARS N = 279		≥ 35-44 YEARS N = 217		% Difference * CI
	n	%	n	%	
When one eats less to lose weight, one feels hungry all day.					-
AGREE	167	59.86	131	60.37	
DO NOT AGREE	99	35.48	68	31.34	
UNCERTAIN	13	4.66	18	8.29	
Men prefer fat women.					-
AGREE	100	35.84	83	38.25	
DO NOT AGREE	167	59.86	116	53.46	
UNCERTAIN	12	4.30	18	8.29	
Fat people feel unhappy.					-
AGREE	181	64.87	151	69.59	
DO NOT AGREE	86	30.82	53	24.42	
UNCERTAIN	12	4.30	13	5.99	
If one exercises daily, one feels healthy					-
AGREE	259	93.17	205	94.47	
DO NOT AGREE	17	6.12	11	5.07	
UNCERTAIN	2	0.72	1	0.46	
It is difficult to lose weight.					-
AGREE	179	64.14	157	72.35	
DO NOT AGREE	91	32.62	55	25.35	
UNCERTAIN	9	3.23	5	2.30	
If one loses weight, one feels proud.					8.2 (0.0;16.2)
AGREE	211*	75.63	182*	83.87	
DO NOT AGREE	58	20.79	29	13.36	
UNCERTAIN	10	3.58	6	2.76	
I enjoy bodily exercise.					8.2 (1.2;15.2)
AGREE	182*	65.23	167*	76.96	
DO NOT AGREE	85	30.47	43	19.82	
UNCERTAIN	1	4.30	7	3.23	

*Difference between number of subjects that agree

To determine the target populations' attitude towards weight control, the subjects were asked various questions. When asked whether or not fat people's clothes fit well, the majority of the younger group (76.34%) as well as the older group (81.57%) responded that fat people's clothes do not fit well. Both groups indicated that they perceive fat people as not being able to work hard (76.7% and 72.35% for the younger and older groups respectively).

The younger and older groups differed significantly with regard to several of the questions. For instance, a larger proportion of the older group (76.96%) felt that fat people are people who eat too much while only 64.52% of the younger group felt this way (CI 4.4;20.2). Another difference was that 83.87% of older females felt that thinner people get jobs more easily while only 72.4% of younger females felt this way (CI 4.2;18.4). Significantly different results were found when respondents reacted to the statement that thin woman are beautiful. While 86.18 % of the older women agreed, only 77.06% of the younger women agreed (CI 2.2;15.8). These results are in conflict with previous questions on body image (table 4) where most of these women indicated that thinner women are not viewed by the community to be attractive.

Most younger women (59.86%) and older women (53.46%), did not agree with the statement that men prefer fat women. Both groups agreed that the community viewed fat people as unhappy (64.87% of the younger group and 69.59% of the older group). Both groups also agreed overwhelmingly with the statement that one feels healthy if one exercises daily. More that 90% of all respondents agreed with this statement. No significant difference in the responses of the younger and older groups to this question was found.

Most of the respondents felt that it is difficult to lose weight (64.14%of younger women and 72.35% of older women). No significant difference was found between die two groups. On the question " If one loses weight, one feels proud" a large percentage had a positive response (75.63% of younger women and 83.87%). There was a significant difference between the percentage women that agreed in the two age groups (CI 0.0;16.2).

4.6 Associations

The results of the relationship between attitude towards weight control and BMI status as well as the relationship between attitude towards weight control and percentage lifetime spent in an urban area are shown in tables 4.9 – 4.17.

4.6.1 The relationship between attitude towards weight control and BMI status

The relationship between BMI status and attitude towards weight control was determined by comparing the responses from the different BMI categories to various questions relating to attitude towards weight control. The categories included in this discussion are underweight (BMI <18.5), lower normal weight (BMI ≥18.5 <20), normal weight (BMI ≥ 20 <25), overweight (BMI ≥ 25 <30) and obese (BMI ≥30).

4.6.1.1 Underweight (BMI <18.5)

Table 4.9 represents the relationship between attitude towards weight control and underweight status. Only 7 women in the younger group and 9 women in the older group were underweight. It must be noted that the number of respondents with a BMI of less than 18.5 and thus underweight was very low which makes it difficult to draw conclusions.

Table 4.9: The relationship between attitude towards weight control and underweight status

UNDERWEIGHT (BMI <18.5)	25 - <35 YEARS N = 7		≥ 35 - 44 YEARS N = 9	
	n	%	n	%
Which person looks the healthiest?				
Underweight	2	28.57	1	11.11
Lower normal weight	2	28.57	3	33.33
Normal weight	1	14.29	0	0.00
Overweight	2	28.57	1	11.11
Obese	0	0.00	4	44.44
Which person's body is the most attractive?				
Underweight	1	14.29	3	33.33
Lower normal weight	1	14.29	2	22.22
Normal weight	1	14.29	2	22.22
Overweight	3	42.86	2	22.22
Obese	1	14.29	0	0.00
Which person looks overweight?				
Underweight	0	0.00	0	0.00
Lower normal weight	0	0.00	0	0.00
Normal weight	1	14.29	1	11.11
Overweight	0	0.00	1	11.11
Obese	6	85.71	7	77.78
Which person looks acceptable?				
Underweight	0	0.00	1	11.11
Lower normal weight	2	28.57	6	66.67
Normal weight	4	57.14	1	11.11
Overweight	1	14.29	1	11.11
Obese	0	0.00	0	0.00
Which person looks underweight?				
Underweight	5	71.43	9	100
Lower normal weight	0	0.00	0	0.00
Normal weight	0	0.00	0	0.00
Overweight	2	28.57	0	0.00
Obese	0	0.00	0	0.00

4.6.1.2 Lower Normal Weight (BMI ≥18.5 <20)

The relationship between attitude towards weight control and lower normal weight status is shown in Table 4.10.

Table 4.10: The relationship between attitude towards weight control and lower normal weight status

LOWER NORMAL WEIGHT (BMI ≥18.5 <20)	25 - <35 YEARS N = 14		≥35 - 44 YEARS N = 17	
	n	%	n	%
Which person looks the healthiest?				
Underweight	2	14.29	3	17.65
Lower normal weight	4	28.57	5	29.41
Normal weight	2	14.29	2	11.76
Overweight	3	21.43	5	29.41
Obese	3	21.43	2	11.76
Which person's body is the most attractive?				
Underweight	1	7.14	2	11.76
Lower normal weight	3	21.43	7	41.18
Normal weight	5	35.71	3	17.65
Overweight	2	14.29	4	23.53
Obese	3	21.43	1	5.88
Which person looks overweight?				
Underweight	0	0.00	0	0.00
Lower normal weight	1	7.14	0	0.00
Normal weight	1	7.14	0	0.00
Overweight	1	7.14	0	0.00
Obese	11	78.57	17	100.00
Which person looks acceptable?				
Underweight	5	35.71	5	29.41
Lower normal weight	2	14.29	5	29.41
Normal weight	4	28.57	4	23.53
Overweight	3	21.43	3	17.65
Obese	0	0.00	0	0.00

Table 4.10: The relationship between attitude towards weight control and lower normal weight status

(Continued)

LOWER NORMAL WEIGHT (BMI ≥18.5 <20)	25 - <35 YEARS N = 14		≥35 - 44 YEARS N = 17	
	n	%	n	%
Which person looks underweight?				
Underweight	10	71.43	15	88.24
Lower normal weight	1	7.14	2	11.76
Normal weight	1	7.14	0	0.00
Overweight	2	14.29	0	0.00
Obese	0	0.00	0	0.00

Only fourteen women in the younger group and seventeen in the older group had a BMI between ≥18.5 and <20, indicating normal weight (Table 4.12). In the younger age group, the category viewed mostly as looking the healthiest was the lower normal weight body (28.57%). In the older age group the body considered to look most healthy was the lower normal weight and the overweight bodies, both at 29.41 %. With regard to the question about which body was considered more attractive, the normal weight body was mostly preferred by the younger group (35.71%). The lower normal weight body was mostly preferred by the older age group in this BMI category (41.18%). The younger group considered the underweight body to look most acceptable (35.71%). The bodies mostly considered by the older group to look acceptable were the underweight and lower normal weight bodies (29.41% in both categories).

4.6.1.3 Normal Weight (BMI 20 <25)

Table 4.11 represents the relationship between attitude towards weight control and normal weight status. One hundred and nine women in the younger group and 79 women in the older group had a normal BMI. Of the 109 younger normal weight subjects 33.94% preferred the overweight body as looking the healthiest while the older normal weight females considered the lower normal weight to be most healthy looking (30.38%).

Both the younger and older respondents in this BMI category considered the lower normal weight body as most attractive (31.19% and 30.38% respectively). A large proportion of women also viewed overweight as attractive (28.44% and 26.58% respectively). Both these groups of respondents however indicated that the overweight body looks acceptable (34.86% and 30.38%). A large percentage also chose normal weight (31.19% and 29.11%) as acceptable.

Table 4.11: The relationship between attitude towards weight control and normal weight status.

NORMAL WEIGHT (BMI 20 <25)	25 - <35 YEARS N = 109		≥ 35 - 44 YEARS N = 79	
	n	%	n	%
Which person looks the healthiest?				
Underweight	9	8.26	9	11.39
Lower normal weight	22	20.18	24	30.38
Normal weight	20	18.35	14	17.72
Overweight	37	33.94	13	16.46
Obese	21	19.27	19	24.05
Which person's body is the most attractive?				
Underweight	8	7.34	8	10.13
Lower normal weight	34	31.19	24	30.38
Normal weight	23	21.10	12	15.19
Overweight	31	28.44	21	26.58
Obese	13	11.93	14	17.72
Which person looks overweight?				
Underweight	0	0.00	0	0.00
Lower normal weight	1	0.92	2	2.53
Normal weight	2	1.83	1	1.27
Overweight	9	8.26	9	11.39
Obese	97	88.99	67	84.81
Which person looks acceptable?				
Underweight	13	11.93	10	12.66
Lower normal weight	21	19.27	20	25.32
Normal weight	34	31.19	23	29.11
Overweight	38	34.86	24	30.38
Obese	3	2.75	2	2.54
Which person looks underweight?				
Underweight	97	88.99	72	91.14
Lower normal weight	7	6.42	6	7.59
Normal weight	2	1.83	1	1.27
Overweight	3	2.75	0	0.00
Obese	0	0.00	0	0.00

4.6.1.4 Overweight (BMI 25<30)

Table 4.12 shows the relationship between attitude towards weight control and overweight status.

Table 4.12: The relationship between attitude towards weight control and overweight status

OVERWEIGHT (BMI 25<30)	25 - <35 YEARS N = 83		≥35 - 44 YEARS N = 60	
	n	%	n	%
Which person looks the healthiest?				
Underweight	4	4.82	2	3.33
Lower normal weight	26	31.33	17	28.33
Normal weight	14	16.87	3	5.00
Overweight	26	31.33	22	36.67
Obese	13	15.66	16	26.67
Which person's body is the most attractive?				
Underweight	6	7.23	6	10.00
Lower normal weight	26	31.33	13	21.67
Normal weight	21	25.30	12	20.00
Overweight	21	25.30	23	38.33
Obese	9	10.84	6	10.00
Which person looks overweight?				
Underweight	1	1.20	0	0.00
Lower normal weight	2	2.41	0	0.00
Normal weight	1	1.20	2	3.33
Overweight	8	9.64	6	10.00
Obese	71	85.54	52	86.67
Which person looks acceptable (Normal weight)?				
Underweight	20	24.10	3	5.00
Lower normal weight	27	32.53	27	45.00
Normal weight	17	20.48	10	16.67
Overweight	17	20.48	20	33.33
Obese	2	2.41	0	0.00
Which person looks underweight?				
Underweight	65	78.31	54	90.00
Lower normal weight	13	15.66	4	6.67
Normal weight	3	3.61	2	3.33
Overweight	2	2.41	0	0.00
Obese	0	0.00	0	0.00

As seen in Table 4:14, eighty three women between the age of 25 and 35 had a BMI between 25 and 30. Sixty of the older respondents fell in the same BMI category. Of the 83 younger women 26 (31.33%) considered the lower normal weight body to look the healthiest. The same number (31.33%) viewed the overweight body to look most healthy. The overweight body was the category most preferred by the older group (36.67%).

The younger women mostly viewed the lower normal weight body to be most attractive (31.33%). Twenty three older women (38.33%) viewed the overweight body to be most attractive. Both age groups in this BMI category responded to the question about which body looks acceptable that they preferred the lower normal weight (32.53% of the younger group and 45% of the older group).

4.6.1.5 Obese (BMI ≥30)

The relationship between attitude towards weight control and obese status is represented in Table 4.13. Sixty five of the younger and fifty two of the older respondents fell within the obese category. Of the younger obese women, 29.23% considered the overweight body to look most healthy while 42.31% of the older women also preferred the overweight body to look the healthiest. The distribution of responses were spread more evenly among the younger women with regard to which body they considered to be most attractive. Seventeen (26.15%), nineteen (29.23%) and eighteen (27.69%) considered the lower normal weight, normal weight and overweight body most attractive, respectively. The lower normal weight body was by far the most popular among the older obese women (40.38%). Twenty eight (43.08%) of younger women

considered the normal weight body to look normal (acceptable) while 34.62% of older respondents considered the overweight body most normal.

Table 4.13: The relationship between attitude towards weight control and obese status.

OBESE (BMI ≥30)	25 - <35 YEARS N = 65		≥ 35 - 44 YEARS N = 52	
	n	%	n	%
Which person looks the healthiest?				
Underweight	10	15.38	6	11.54
Lower normal weight	10	15.38	13	25.00
Normal weight	11	16.92	2	3.85
Overweight	19	29.23	22	42.31
Obese	15	23.08	9	17.31
Which person's body is the most attractive?				
	5	7.69	6	11.54
Underweight	17	26.15	21	40.38
Lower normal weight	19	29.23	10	19.23
Normal weight	18	27.69	10	19.23
Overweight	6	9.23	5	9.62
Obese				
Which person looks overweight?				
Underweight	0	0.00	0	0.00
Lower normal weight	1	1.54	0	0.00
Normal weight	0	0.00	1	1.92
Overweight	4	6.15	3	5.77
Obese	60	92.31	48	92.31
Which person looks acceptable (Normal weight)?				
Underweight	6	9.23	7	13.46
Lower normal weight	10	15.38	15	28.85
Normal weight	28	43.08	12	23.08
Overweight	20	30.77	18	34.62
Obese	1	1.54	0	0.00
Which person looks underweight?				
Underweight	59	90.77	48	92.31
Lower normal weight	6	9.23	2	3.85
Normal weight	0	0.00	0	0.00
Overweight	0	0.00	2	3.85
Obese	0	0.00	0	0.00

4.6.2 The relationship between attitude towards weight control and percentage lifetime spent in an urban area.

To determine the relationship between attitude towards weight control and lifetime spent in an urban area the respondents were divided into four groups:

- Those who spent 0 – 20% of their lives in an urban areas
- Those who spent 20 < 50% of their lives in an urban area.
- Those who spent 50 < 80% of their lives in an urban area.
- Those who spent > 80% of their lives in an urban area.

These four groups were once again divided into the older and younger age groups. These eight groups were then compared in terms of their responses with regard to questions related to attitude towards weight control.

4.6.2.1 Less than twenty percent lifetime spent in an urban area

Eighty of the younger women spent less than 20% of their lives in an urban area while 64 of the older women spent less than 20 % of their life time in a urban area thus representing the least urbanized group. In the younger group 30% considered the overweight body to look the most healthy. The overweight body was the body considered most healthy among the older women in this group (31.25%), while a large percentage of older women (28.13%) also viewed the overweight body as healthy. The body considered most attractive by both age groups was the lower normal weight body (38.75 of younger women and 32.8% of older women).The body that was considered to look most normal by the younger groups who spent 0 – 20% of their lifetime in an urban area was the overweight body (33.75%). As far as the older group is concerned, 37.5% chose the lower normal weight as acceptable (Table 4.16).

Results of the respondents who spent less than twenty percent of their life in an urban area are shown in Table 4.14.

Table 4.14: 0 - 20% Lifetime spent in an urban area

	25 - <35 YEARS N = 80		≥ 35 - 44 YEARS N = 64	
	n	%	n	%
Which person looks the healthiest?				
Underweight	9	11.25	5	7.81
Lower normal weight	20	25.00	15	23.44
Normal weight	14	17.50	6	9.38
Overweight	24	30.00	18	28.13
Obese	13	16.25	20	31.25
Which person's body is the most attractive?				
Underweight	5	6.25	8	12.50
Lower normal weight	31	38.75	21	32.81
Normal weight	19	23.75	11	17.19
Overweight	19	23.75	18	28.13
Obese	6	7.50	6	9.38
Which person looks overweight?				
Underweight	1	1.25	0	0.00
Lower normal weight	0	0.00	1	1.56
Normal weight	3	3.75	2	3.13
Overweight	9	11.25	2	3.13
Obese	67	83.75	59	92.19
Which person looks acceptable(Normal weight)?				
Underweight	16	20.00	7	10.94
Lower normal weight	12	15.00	24	37.50
Normal weight	24	30.00	16	25.00
Overweight	27	33.75	16	25.00
Obese	1	1.25	1	1.56
Which person looks underweight?				
Underweight	65	81.25	56	87.50
Lower normal weight	13	16.25	6	9.38
Normal weight	1	1.25	0	0.00
Overweight	1	1.25	2	3.13
Obese	0	0.00	0	0.00

4.6.2.2 Twenty to 49 percent of lifetime spent in an urban area

Table 4.15 shows the results of the respondents who spent twenty to fifty percent of their lifetime in an urban area.

Table 4.15: 20 - 49% Lifetime spent in an urban area

	25 - <35 YEARS N = 79		≥35 - 44 YEARS N = 75	
	n	%	n	%
Which person looks the healthiest?				
Underweight	8	10.13	12	16.00
Lower normal weight	17	21.52	26	34.67
Normal weight	17	21.52	4	5.33
Overweight	23	29.11	18	24.00
Obese	14	17.72	15	20.00
Which person's body is the most attractive?				
Underweight	7	8.86	12	16.00
Lower normal weight	19	24.05	22	29.33
Normal weight	16	20.25	14	18.67
Overweight	25	31.65	20	26.67
Obese	12	15.19	7	9.33
Which person looks overweight?				
Underweight	0	0.00	0	0.00
Lower normal weight	1	1.27	0	0.00
Normal weight	0	0.00	1	1.33
Overweight	4	5.06	7	9.33
Obese	74	93.67	67	89.33
Which person looks acceptable (Normal weight)?				
Underweight	10	12.66	8	10.67
Lower normal weight	21	26.58	25	33.33
Normal weight	23	29.11	14	18.67
Overweight	22	27.85	27	36.00
Obese	3	3.80	1	1.33
Which person looks underweight?				
Underweight	71	89.87	97.33	97.33
Lower normal weight	6	7.59	2.67	2.67
Normal weight	0	0.00	0.00	0.00
Overweight	2	2.53	0.00	0.00
Obese	0	0.00	0.00	0.00

As can be seen in Table 4.17, 79 of the respondents in the younger age group spent between 20 to 50% of their lives in an urban area. Seventy five respondents in the older age group spent between 20 to 50% of their lifetime in an urban area.

For the younger women who spent 20 to 50% of their lives in an urban area the overweight body was considered to appear most healthy (29.11%) while for the older women 34.67% considered the overweight body to appear most healthy.

The body that was considered to be most attractive by the younger group was the overweight body (31.65%). In the older group 29.33% and 26.67% considered lower normal weight and overweight as most attractive.

The distribution of responses with regard to which body they considered to be of normal weight were spread more evenly among younger women. Twenty three percent, 22% and 21% considered normal weight, overweight and lower normal weight to be acceptable. The overweight body was most popular among the older women (36%).

4.6.2.3 Fifty to 79 percent of lifetime spent in an urban area

Results of the respondents who lived in an urban area between fifty and 79 percent of their lifetime are shown in Table 4.16.

Table 4.16: 50 - 79 % Lifetime spent in an urban area

	25 - <35 YEARS N = 17		≥ 35 - 44 YEARS N = 9	
	n	%	n	%
Which person looks the healthiest?				
Underweight	2	11.76	2	22.22
Lower normal weight	1	5.88	1	11.11
Normal weight	1	5.88	2	22.22
Overweight	9	52.94	3	33.33
Obese	4	23.53	1	11.11
Which person's body is the most attractive?				
Underweight	1	5.88	1	11.11
Lower normal weight	2	11.76	2	22.22
Normal weight	6	35.29	1	11.11
Overweight	7	41.18	4	44.44
Obese	1	5.88	1	11.11
Which person looks overweight?				
Underweight	0	0.00	0	0.00
Lower normal weight	0	0.00	0	0.00
Normal weight	0	0.00	0	0.00
Overweight	0	0.00	1	11.11
Obese	17	100.00	8	88.89
Which person looks acceptable (Normal weight)?				
Underweight	0	0.00	2	22.22
Lower normal weight	5	29.41	1	11.11
Normal weight	8	47.06	4	44.44
Overweight	4	23.53	2	22.22
Obese	0	0.00	0	0.00
Which person looks underweight?				
Underweight	16	94.12	7	77.78
Lower normal weight	0	0.00	2	22.22
Normal weight	0	0.00	0	0.00
Overweight	1	5.88	0	0.00
Obese	0	0.00	0	0.00

Only 17 of the younger and 9 of the older respondents spent more than 50% but less than 79% of their lifetime in an urban area. It must be noted that the number of respondents in this category was very low, making it difficult to draw conclusions.

For the younger women who spent 50 to 79% of their lives in an urban area the overweight body was considered to appear most healthy, (52.94%) while for the older women 33.33% considered the overweight body to appear most healthy.

The body that was considered to be most attractive by the younger group was the overweight body (41.18%), while the older women viewed the overweight body as most attractive (44.44%). On the question which person looks acceptable, 47,06% of the younger and 44.44% of the older women considered normal weight as acceptable.

4.6.2.4 Eighty percent or more of lifetime spent in an urban area

Table 4.17 shows the results of the respondents who spent eighty percent or more of their lifetime in an urban area.

Table 4.17: ≥ 80 % Lifetime spent in an urban area

	25 - <35 YEARS N = 102		≥ 35 - 44 YEARS N = 69	
	n	%	n	%
Which person looks the healthiest?				
Underweight	8	7.84	2	2.90
Lower normal weight	26	25.49	20	28.99
Normal weight	16	15.69	9	13.04
Overweight	31	30.39	24	34.78
Obese	21	20.59	14	20.29
Which person's body is the most attractive?				
Underweight	8	7.84	4	5.80
Lower normal weight	29	28.43	22	31.88
Normal weight	28	27.45	13	18.84
Overweight	24	23.53	18	26.09
Obese	13	12.75	12	17.39
Which person looks overweight?				
Underweight	0	0.00	0	0.00
Lower normal weight	4	3.92	1	1.45
Normal weight	2	1.96	2	2.90
Overweight	9	8.82	9	13.04
Obese	87	85.29	57	82.61
Which person looks acceptable (Normal weight)?				
Underweight	18	17.65	9	13.04
Lower normal weight	24	23.53	23	33.33
Normal weight	32	31.37	16	23.19
Overweight	26	25.49	21	30.43
Obese	2	1.96	0	0.00
Which person looks underweight?				
Underweight	84	82.35	62	89.86
Lower normal weight	8	7.84	4	5.80
Normal weight	5	4.90	3	4.35
Overweight	5	4.90	0	0.00
Obese	0	0.00	0	0.00

One hundred and two younger women and 69 older women spent more than 80% of their lifetime in an urban area, representing the most urbanized section of the sample.

For the younger women who spent 80% and more of their lives in an urban area the overweight body was considered by 30.39% to appear most healthy, while 34.78% of the older women considered it to appear most healthy.

The body that was considered to be most attractive by the younger group was the lower normal weight body (28.43%). Almost the same percentage of women (27.45%) also viewed normal weight as most attractive. In the older group the overweight body (31.88%) was viewed as most attractive.

The body that was considered to look most normal by the younger groups was the overweight body (31.37%) and for the older group it was the lower normal weight body (33.33%).

4.7 Summary

Results of the study are presented in this chapter. Anthropometric measurements included BMI, fat distribution and fat percentages. In the younger group, 53.41%, and in die older group, 51.61% had a BMI $\geq$ 25. Fat distribution indicated that most women (83.5% of the younger women, and 62.7% of the older women) had a gynoid fat distribution. A high percentage of women (92.47% and 94.01% for the younger and older groups respectively) had a body fat percentage higher than 25 percent.

A high percentage of respondents, 31.29% of the older group and 29.03% of the younger group, chose the photo depicting overweight to be the healthiest. In addition they largely chose the photo depicting lower normal weight as attractive (29.14% and 30.88% respectively). A large percentage of the younger respondents perceived the

normal weight photo as a normal weight body, while the older respondents chose the lower normal weight photo to be a normal weight body.

A large percentage of respondents indicated that they perceive the community to view obese people as being rich. As far as obesity and attractiveness are concerned, most women in the younger group (60,43%) and older group (58.06%) viewed obese persons as less attractive in the eyes of the community, but they also thought that obese people are healthy.

The younger and older groups differed significantly with regard to several of the questions, such as, fat people are people who eat too much, thinner people get jobs more easily and thin woman are beautiful.

The relationship between BMI status and attitude towards weight control was also determined. The normal weight younger group largely preferred the overweight body as looking healthy while the older group considered the lower normal weight to be most healthy looking. The overweight and obese younger respondents responded to the question about which body looks acceptable that they preferred the lower normal weight while the obese older respondents chose the overweight body to be acceptable.

The relationship between attitude towards weight control and lifetime spent in an urban area was determined. Eighty younger woman and 64 older women spent less than 20% of their lifetime in an urban area thus representing the least urbanized group, while 102 younger and 69 older women spent more the 80% of their lifetime in an urban area, representing the most urbanized group.

CHAPTER 5

Discussion of results

5.1 Introduction

In this chapter, the results obtained in the study are discussed. Limitations of the study are pointed out and the effect that they could have had on the study is discussed. Where possible, reasons for findings are given and results are compared to those of other relevant studies.

5.2 Limitations of the study

There was an unequal division of the sample as discussed under 4.2 under "Distribution of age group". This unequal division had no effect on the results of the study since the sample was quite large and there were still a large number of respondents in each age group.

Unfortunately a question relating to the subjects perception of her own BMI status (according to the five photographs depicted) was not included. For this reason it was not possible to make conclusions regarding the actual antropometrically derived BMI of each respondent and that perceived by the respondent.

5.3 Discussion of results: Main study

5.3.1 Anthropometry

5.3.1.1 Body Mass Index

The high incidence of overweight women in the study group (younger and older women) was an outstanding anthropometric feature, with more than fifty percent of the women in both age groups having a BMI greater than 25 kg/m^2. The prevalence of obesity in this group ranged between 23.3 and 24 percent for the two age groups respectively. These results are in contrast to findings from the QwaQwa - Mangaung study by Mollentze *et al.* (1995), in which prevalence ranged from 31.1 to 54.3 percent in Mangaung women. Although the percentage of the obese women in this study were slightly lower than the figures reported by Mollentze *et al.* (1995), the percentage of overweight women should also be a matter of concern, as overweight may eventually lead to obesity.

Statistics reported from the Coronary Heart Decease Risk Factor Study in the African population of Cape Peninsula (BRISK) study performed on African women in the Cape Peninsula (Steyn *et al.*, 1991) showed that the mean percentage of African women with a BMI above thirty was found to be 30.6 percent, and 47.7 percent respectively for women of the same age groups used in our study. Data obtained from three other large South African studies on coloured women in the Coronary Risk Factor Study (CRISIC) among the coloured population of the Cape Peninsula study (Steyn *et al.*, 1990), Indian women (Seedat *et al.*, 1990) and White women in the Coronary Risk Factors Resurvey Study (CORIS study) (Jooste *et al.*, 1988), were all lower than figures reported for African women.

5.3.1.1 Waist-Hip-Ratio

Gynoid fat distribution in women is defined as a waist-hip-ratio (WHR) higher than 0.80 (Hammond, 2000,p.372). In this study, most women in both age groups had a WHR below 0.8, indicating a gynoid fat distribution. In the older group 37.3 percent of women had a WHR equal to or above 0.8, indicating an android fat distribution. Mollentze *et al.* (1995), who studied the indigenous African populations of QwaQwa and Mangaung, found that a subgroup of obese persons with central or android obesity are at greater risk of developing cardiovascular disease. The mean WHR of women in both these populations, and for all age groups, exceeded 0.8 (Mollentze *et al.,* 1995). A study performed in urban Africans in Cape Town, however showed a mean WHR of 0.8 for women above the age of thirty years (Levitt *et al.,*1993). Van der Merwe *et al.* (1999) obtained similar results in a study amongst obese black and white women. Fat distribution is affected by a number of conditions, such as gender and ethnicity. Women in general have less central fat than men do. This difference in gender might be an important contributor to the greater prevalence of diseases associated with central obesity in men compared with pre-menopausal women (Pi-Sunyer & Albu, 1999). A peripheral fat distribution shows relationships with less serious problems, such as joint disease and varicose veins due to mechanical problems associated with increased weight (Björntorp, 2001). Different ethnic groups might also accumulate abdominal fat differently as they gain weight (Pi-Sunyer & Albu, 1999). Conway *et al.* (1995) however reported mean WHR's of 0.86cm and 0.84cm for black and white women respectively, indicating that there were no significant differences between races. Treatment of overweight in particularly women in the older age group, where 37.3 percent of respondents had WHR equal to or exceeding 0.8 should receive high priority to decrease the risk of cardiovascular disease, type 2 diabetes, stroke, certain cancers,

and premature mortality (Björntop, 2001). An increase in physical activity might also have a favourable effect on body fat distribution, resulting in a reduction in the WHR (Walker, 1995) and abdominal obesity (Björntop, 2001).

5.3.1.2 Fat percentage

Almost all the subjects had a fat percentage higher than the recommended 25 to thirty percent (92.5 percent and 94 percent for the two age groups respectively). The mean fat mass percentage of white and African obese women studied by Van der Merwe *et al.* (1999), was reported as 42.1 and 45 percent respectively. Although it is difficult to compare the results, the figures reported by Van der Merwe *et al.* (1999) also indicated fat percentages much higher than the normal percentage of twenty to 25 percent.

5.4 Body image

Most studies on obesity and body image have been conducted in America. Han *et al.* (1998) found that white men and women (28–67 years) perceived overweight as unhealthy and believed that it leads to a shorter life span. Black women in the USA were more satisfied with their body size than white women (Stevens *et al.*, 1994). A similar study by Kemper *et al.* (1994), also showed a significant difference between black and white adolescent's perceptions of body size. This might be explained by the fact that black women are not under the same cultural pressure to maintain a lower body weight as White women (Dolan, 1990).

In order to determine how the target population of Mangaung viewed body shape and size they were exposed to the photographs discussed in chapter 3. Their responses are

presented in chapter 4.

5.4.1 Perception on health, attractiveness and weight.

The photograph that was mostly chosen when asked which person looks the healthiest, was the picture of an overweight body (BMI 25<30). Other studies done in South Africa also reported that black women perceived obesity as normal and healthy (Kruger *et al.*, 1994). The picture depicting the range of normal weight person was fairly unpopular in terms of health. Even the picture depicting a lower normal weight was chosen more often. Twenty nine percent of respondents from the older group considered the lower normal weight person healthier while 63 (29%) of the respondents in the same age group chose the overweight body as being healthier. One would expect that the younger women would rather choose the normal or lower normal weight bodies as being most healthy due to exposure to western lifestyle (media, gym) but this was not the case. Only 17 percent of younger women chose the normal weight photo as the one depicting the healthiest person.

When respondents had to choose the body they perceived as most attractive, the distribution of responses were similar to those chosen to depict health. Again the majority of respondents in both age groups chose the lower normal weight and overweight bodies as most attractive. Slightly more individuals in both age groups indicated that the lower normal weight body was attractive. This implies that all members in the target population do not view health and attractiveness as "synonymous".

A number of studies have shown that, compared to white women, non-westernised and some groups of westernised black women have adopted a larger ideal body size. They do not necessarily perceive overweight as unattractive, and are therefore less likely to

aspire to thinness (Abrams, *et al.*, 1993; Cogan *et al.*, 1996; Dolan, 1990; Greenberg & La Porte, 1996; Melnyk & Weinstein, 1994; Stiegel-Moore *et al.*, 1995; Toriola *et al.*, 1996; Wilfley *et al.*, 1996).

When asked which person in the photographs looks overweight, acceptable or normal weight, the body size representing normal weight was not a popular choice. When asked which photograph depicted overweight, the majority of respondents in both age groups chose the photograph representing obesity (80% in both age groups). Most respondents could also correctly identify the photo depicting underweight (85% and 91% in the younger and older groups respectively). A large proportion of women however, felt that the photo depicting overweight looked most acceptable (28 and thirty percent in the younger and older group respectively). Similarly 22 percent of younger women and 34 percent of older women felt that the lower normal weight photo looked most acceptable.

Research has shown that African-American females are less concerned with weight, dieting, or being thin (Abrams *et al.*, 1993; Akan & Grillo, 1995; Rucker & Cash, 1992). They found the the females would rather be "a little overweight" than "a little underweight". There are various reasons for the perception. African American women are more culturally "protected" from body image distortions (Hsu, 1987; Root, 1990). Social and cultural attitudes and beliefs are often given as reasons for non-compliance with imformation given during nutrition counseling (Caterson, 1998). The results of this study seem to support this data from America, indicating that culture plays an important role in body image perception.

5.4.2 Perception on how the community reacts towards under- and overweight persons.

In this section a discussion on how respondents viewed their community's reaction towards people of various body size will follow. The first question of whether people in the community viewed obese people as rich yielded some surprising results. Almost half of both age groups considered this to be the case. By western standards this is astonishing since the western view on health and wealth is totally different. One possible reason for this phenomenon is that many respondents view being rich as being able to afford a lot of food. In a study done amongst black South African women (18-36) in peri-urban Cape Town, an increased body mass was also perceived by some as an indication of well being (Mvo,1999). Powers (1980) has suggested that in some cultures obesity is admired and these cultures value obesity as a symbol of success and economic security.

When respondents were asked whether obese people are thought to be healthy by their community more than half of respondents affirmed (Table 5). Once again this is not in accordance with western standards. This also supports the belief that health and body size are not associated with each other.

When respondents were asked whether the community saw obese people as attractive 40 % agreed. This is also very different from the western viewpoint where obesity is considered to be unattractive. Beauty norms differ in societies and the stigma of fatness as ugly is far from a universal value. Kumanyika *et al.* (1993), drawing from a sample of 25-64 year old African American women (n=500), found that about forty percent of the women in the overweight categories (based on BMI) considered their figures to be

attractive.

Most respondents felt that communities considered thinner people to be poor. Traditionally, a wide waist was seen as a sign of prosperity and health, while a skinny frame meant that a person was too poor to afford enough to eat (Powers, 1996). During the twentieth century these views have been reversed in most developed countries. However, in less-developed countries where access to food is frequently still uncertain, fatness seems to still be a sign of prestige (Powers, 1996).

Underweight people are also considered to be in poor health in the eyes of the community (62 percent and 68 percent of younger and older respondents respectively). The same pattern of responses was obtained when respondents were asked how their community felt about the attractiveness of underweight persons. This result is in contrast to the results of the weight control questionnaire (table 7) where the vast majority of respondents agreed that thin women are beautiful. Perhaps respondents view thin women in the media and thin women in the community differently. Wilfley *et al.* (1996) has found that black women are not immune to the mainstream image dissatisfaction. This is supported by the fact that when persons of different cultures come together the Western norms of thinness will prevail (Akan & Grillo, 1995; Cogan *et al.*, 1996; Lee *et al.,* 1996; O'Dea, 1995; O'Dea, 1998). This acculturation process can occur during westernisation and or urbanisation especially through the increased exposure to Western advertising, marketing, entertainment and fashions (O'Dea, 1995).

If the responses of the women with regard to the communities' reaction towards underweight people are considered, they are generally negative. These women

overwhelmingly viewed the community as perceiving underweight bodies as undesirable not only in terms of attractiveness but also in terms of health and wealth.

5.5 Attitude towards weight control

As was mentioned in Chapter 2 the attitude of a person has behavioral, cognitive and affective components. In this part of the investigation efforts were made to determine respondent's beliefs with regard to obesity as well as the corresponding feelings or emotions.

The Western society experiences obesity negatively as the result of overeating. Obesity is also seen as a self-inflicted problem, and obese people are typically classified as "lazy" lacking in self-control and will power (Agell & Rothblum, 1991). The obese are often unable to work and enjoy life, they are even predisposed to sudden death (Mason, 1981). Obese find it difficult to find clothes in appropriate size ranges, at reasonable prices (Allon, 1982:30-31).

When respondents in this study were asked whether obese people's clothes fit well both age groups indicated the perception that it is not the case. Most also believe that fat people do not have the ability to work hard, and that thin people find jobs more easily. From these data it may be deducted that most of the respondents view obesity as detrimental to job related success such as productivity and employment.

In a study done in South Africa (Khayelitshia in Cape Town) amongst overweight black women (18-45 years) the women who expressed their discontentment with their shape,

gave two main reasons for their unhappiness. Firstly they found that they were unable to wear the clothes they previously enjoyed wearing, secondly they expressed difficulty moving around. The women who were unhappy about their obesity gave practical reasons for their dissatisfaction. None of the women identified potential health reasons as a motivation to lose weight (Mvo *et al.* 1999).

One response that yields an unexpected finding is the amount of younger respondents who did not consider fat people to be eating too much (30.82%). A study done by Gore (1999) on African American women with a mean age of 36.4 years found the respondents viewed weight, body size and attitude towards weight control in a cultural context. This culture includes the foods they ate, the family, and the social context of family gathering where food was the central focus. Foods high in fats and carbohydrates have a filling effect and they developed a taste for these kinds of foods. This can imply that the relationship between eating habits and body size is not so clear in the belief system of many of the respondents. Apart from biological dysfunction, diseases or lack of exercise and poor eating habits are directly correlated with obesity.

More than three out of every four respondents perceived thin women to be beautiful. As mentioned this is surprising considering the way they believed that the community reacts to the underweight person. One factor that may be playing a role is their conceptual understanding of thin women. It could be that the "thin person" and underweight body are not considered to be the same concept and that people with higher body mass indexes are still considered to be thin.

The respondent's attitude towards weight control is further demonstrated by the fact that the majority believe that dieting behavior leads to chronic hunger. This will further

complicate programs to change eating behavior in order to combat obesity. This result is supported by their perception that losing weight is difficult.

Studies as far back as 1965 indicated that in Western cultures (e.g. Unites States, Sweden, Britain) women experienced social pressures (men, family, friends and fashion) to be thin (Ndlovo & Roos, 1999; Pate *et al.*, 1992). In contrast, a positive relationship between body weight and socioeconomic status has been observed in less affluent, developing countries such as Latin American, Puerto Rico (Dolan, 1990) and South China (Chang *et al.*, 1963 cited by Jackson & McGill, 1996). Some cultures value obesity, or at least find it more acceptable than other cultures. It was found that in the United States the African American men prefer larger bodied females (Maddox *et al.*,1968; Thompson *et al.*, 1996). Moreover, their preference may help explain why African American females have more favorable body images, and are less concerned about weight loss and dieting than the White American females (Cash & Henry, 1995; Schulken *et al.*, 1997).

In this study a large percentage of respondents have the perception that men no longer prefer fat women (59.86 % and 53.46% respectively for younger and older women). These data could indicate that there is a definite change in the cultural norms concerning body shape, which is most probably linked to the urbanisation process currently in progress in South Africa.

With the escalating rates of obesity worldwide, a survey of American women reported that seventy percent of overweight and 41 percent of thin women do not like their bodies and suggested that this negative body image is fueled by unrealistic images of females portrayed in the media. The respondents in this study mostly agreed that fat people feel

more unhappy, being fit leads to a healthy feeling and loss of weight to proud experience. Most also stated that they enjoy exercise. Considering the dominating overweight and obese anthropometrical status among respondents, the apparent positive attitude towards exercise may also be biased by the researcher's perceived preference.

5.6 Associations

5.6.1 The relationship between attitude towards weight control and BMI status

In order to determine attitude towards weight control and the individuals current BMI, the various BMI categories, (underweight, lower normal weight, normal weight, overweight and obese,) were compared in terms of attitude towards weight control.

Firstly it must be noted that the sample sizes for respondents in the underweight and lower normal weight BMI categories were very small. Results based on these samples may therefore not be an accurate reflection or representative of other women in these categories.

The respondents had to choose the body they considered to look most healthy. Interestingly, very few respondents in all of the groups preferred the normal weight body in terms of looking healthy. The BMI categories mostly preferred were the overweight (BMI $\geq 25 < 30$ kg/m^2) and lower normal weight ($\geq 18.5 < 20$ kg/m^2) categories. On the one hand, there are the women who still see the overweight body as looking most healthy, consistent with the more traditional view among black people of a lower social

status. On the other hand there were respondents who considered the underweight body to be looking more healthy. This view is more consistent with the typical western view of health and physical attraction.

The only group that preferred the obese body as looking most healthy was the older underweight respondents. It must be noted that this age group was represented by only nine respondents and this might have influenced the result. The only group that also showed a high preference for the underweight body as looking most healthy was the younger underweight group. Again the sample group consisted of only seven subjects. The younger normal weight respondents had a high preference for the overweight body while the older normal weight respondents mostly preferred a lower normal weight. The younger and older overweight and obese respondents also had a high preference for the overweight body as most healthy. Researchers (Burke, *et al.*, 1990) found that White women were more likely than black women to perceive obesity as harmful, despite the fact that black women were much likely than white women to perceive themselves as being "much too fat"(31%, 11%). According to a Roper Starch survey released in April, 2001, it was found the 62 percent of overweight people in the United States did not believe that overweight was a serious health risk, even though it has been well established that being overweight or obese is a risk factor for heart disease, cancer, high blood pressure, high cholesterol and diabetes (Burke, *et al.*, 1990).

When the respondents were asked which person's body is most attractive results varied between the various groups. The older obese women mostly viewed the lower normal weight body size as most attractive, yet the same group considered the overweight body as most healthy. This implies that this group of respondents does not necessarily view attractiveness and health as related.

The same discrepancy existed among the younger normal weight group. Again the over- weight body size was perceived as more healthy while the lower normal weight body size was considered more attractive. As with the older obese group it could be that health and physical attraction is not seen as related. It might however also be that Western influence such as television and media influenced the respondent's view on attractiveness.

As far as attractiveness of bodies is concerned there is very little overall consistency across the groups. The normal weight respondents in both the older and younger groups preferred the lower normal weight body size, while the older overweight body respondents generally preferred the overweight body size. Kumanyika, *et al.* (1993), drawing from a sample of 25-64 year old African American women (n=500), found that about fourty percent of the women in the overweight categories considered their figures attractive or very attractive.

The younger obese women's choices of most attractive body sizes in this study were evenly distributed between the lower normal weight, normal weight and overweight categories indicating that all women in that age group do not share the same opinion.

The variance across groups indicates that the body size of the respondent is a very poor predictor of preference with regard to attractiveness. The same holds true for health and body size. The respondents' own body size appears not to influence what they view as a healthy body. Furthermore the specific age group to which the respondent belongs does not seem to have an influence on the individuals choice of preferred body size or perceived health either. The older normal weight women for instance preferred the lower normal weight body as attractive while the older overweight women preferred the

overweight body. This is further supported by the fact that younger obese women preferred normal weight bodies as most attractive where younger overweight women and normal weight women preferred lower normal weight bodies as most attractive. It is deducted from this evidence that age also appears to be a poor predictor of preference. It must be noted that the age difference in the two groups included in the sample did not differ very much, with both groups falling in the post-pubertal, pre-menopausal stage.

Research (Furnham & Alibhai, 1983) suggests that the overall wealth of an ethnic group affects the rating of attractiveness such that the greater the wealth the more thinness is felt desirable and *vise versa*. In a study done by Furnham & Alibhai (1983), it was found that Ugandan subjects tended to rate the more heavy obese figures as much more attractive and healthy than British subjects.

On the question "which person looks acceptable or normal weight" both women in the younger and older, normal weight group mostly chose the overweight body as looking most acceptable. The overweight respondents however mostly chose the lower normal weight body as most acceptable. In the case of the older obese respondents, they mostly chose the normal weight person as acceptable. On the other hand the younger obese respondents view the overweight person to be normal weight.

Some researchers have suggested that perceptual distortion of body size is a characteristic of individuals with eating disorders (Garner *et al.*, 1976). In contrast, Fernandez *et al.* (1993) found no differences in body size estimation between eating-disordered and non-eating-disordered women. Some studies have shown that women show an overall tendency to underestimate their body size, whereas others have found that overestimation is the norm (Gardner & Tockerman, 1993; McCaulay, *et al.*, 1988).

Some studies also suggested that people distort their body sizes to bring them closer to the "normal" norm (Gray, 1977 sited by Monteath & McCage, 1997; Gustavson *et al.*, 1990). In this case over- and underestimation of body size also could be a reason for the mentioned results.

In general, studies done is South Africa (Senekal, 1988; Senekal et al., 2001) and overseas (Bellisle *et al.*, 1995; Melnyk & Weinstein, 1994), have indicated that the weight pattern of black students follows the pattern found in black American females, thus an acceptance of a higher weight. This could indicate that the culturally accepted higher weight by black South African females still plays an important role in body image and perception of body size.

5.6.2 The relationship between attitude towards weight control and the percentage lifetime spent in an urban area

To determine the possible influence of urbanization on attitude towards weight control the respondents were placed in one of four categories depending on the percentage of their lifetimes spent in an urban area. These categories were compared in terms of their responses to the questions relating to attitude towards weight control.

Where the categories were compared with regard to the question, "which person looks the healthiest", there was little variance across the four categories. In all categories, the body mostly perceived to be most healthy was the overweight body. The older women that spent less than twenty percent of their lifetime in an urban area perceived the obese body as most healthy, and the older women that spent between twenty and fifty percent of their lives in an urban preferred the lower normal weight body. In both these cases

however the body perceived as most healthy by the second highest number of respondents in these particular groups was the overweight body.

When the four categories were compared in terms of their view on attractiveness of the various body sizes the results were less consistent. The lower normal body was mostly preferred by the women that spent less than twenty percent, and the women that spent eigthy and more percent of their lives in an urban area. The older women who spent between fifty and eighty percent of their lives in an urban area also preferred this body. This result is rather surprising since one would expect that percentage time spent in an urban area would allow for more exposure to western influence, which in turn would result in a decrease in preferred body size. None of the four categories chose the normal weight body as the most preferred, neither in the younger nor older women. Only in two cases, (older women that spent between fifty and eighty percent of lifetime in an urban area,) and younger women that spent more than eighty percent in an urban area, was the normal weight body second in terms of preference. In all other cases either the overweight body or the underweight body was mostly preferred.

When the four categories were compared in terms of their responses with regard to which body seems to be normal (acceptable) the responses were inconsistent once again. For instance, among the women who spent less than twenty percent of their lives in an urban area, more of the younger women viewed overweight bodies as normal while more of the older women viewed underweight bodies as normal. Unlike responses related to attractiveness or perceived health however, the normal weight body was viewed by many respondents as the body that seemed to be normal. Even in the cases where the normal weight body was not perceived as normal this body size was the second most frequently chosen one.

Time spent in an urban area, seems to have little or no effect on how women in the various categories view body shape and size. One would expect that the respondent who spent most of their lives in urban areas would be prone to view thinner people as more attractive, healthier and normal with regard to weight. Instead no evidence supporting this notion could be found. One would also expect that the women who spent the majority of their lives outside urban areas or in rural areas would be inclined to prefer heavier bodies as looking normal and attractive, but this was not the case.

5.7 Summary

An outstanding feature of the women who participated in this study was that they were extremely overweight. Furthermore, high levels of fat percentages were measured in more than ninety percent of all the women, probably indicating low levels of physical activity.

Overweight and obese women were rated as rich by approximately fifty percent of the subjects. However, it was also apparent that a large percentage of women perceived body sizes that represented the range of lower normal weight as attractive. The majority of the respondents indicated that thin (underweight) people are not considered to be healthy or attractive. This implies that health and attractiveness are not always viewed as parallels.

CHAPTER 6

Conclusions and recommendations

6.1 Introduction

Body image varies greatly across cultures. For this reason it is important to understand the body image of the members of a specific community before the community's eating behaviour can be understood.

An individual's attitude is affected by his or her beliefs and factual knowledge (cognitive component). The same holds true for the attitude towards weight control. This population proved to have many beliefs inconsistent with that held in western societies. These beliefs influence attitude and therefore eating behaviour.

6.2 Conclusions

The following conclusions evolved from the study:

6.2.1 Anthropometry

- The prevalence of overweight and obesity of the respondents was an outstanding anthropometric feature.
- Most of the women in both age groups have a waist-hip-ratio smaller than 0.80, indicating a gynoid fat distribution.

- A matter that needs urgent attention, is the total number of women who have high fat percentage. Regardless of weight, almost all the respondents had a fat percentage higher than 25 percent.

6.2.2 Body Image

- The overweight body was mostly preferred in terms of attractiveness.
- Health is related to bigger body size unlike the view held by the western culture.
- Individuals mostly feel that the community views obese people as healthy.
- Forty percent of respondents stated that the community considers obese people as attractive.

6.2.3 Attitude towards weight control

The belief system in the population does not promote dieting behaviour for the following reasons:

- Almost a third of respondents do not perceive obesity as a result of poor eating habits.
- The majority of respondents believe that dieting causes chronic hunger and therefore suffering.
- Wealth is considered to be related to obesity and a bigger body therefore portrays status.
- Overweight women are considered healthier that thin women.
- The overweight person is not viewed as unattractive. Many respondents viewed overweight body as most attractive.

It becomes obvious that motivation to alter eating or exercising behaviour is very low amongst the black women . The cognitive component of this negative attitude towards weight control can be seen as a major factor that plays a role in obesity as was indicated under the anthropometric results.

6.2.4 Associations

The relationship between BMI status and attitude towards weight control is inconsistent across different BMI groups. The individual's own body size is a poor predictor of the body size considered most attractive by that individual.

The notion that time spent in an urban area, influences the respondent's attitude towards weight control or body satisfaction could not be supported by this study. Time spent in an urban area had no systematic relationship to how respondents viewed body sizes and weight control. It is important to note, however, that all women included in the study had some experience of urban living. Mollentze *et* al. (1995) also concluded that urban and rural women in the Free State were relatively uniform as regards prevalence of obesity and associated diseases.

6.3 Recommendations

Results indicated an extremely high fat percentage among the target population. Exercise helps to alter the body composition favourably by reducing fat. Increased physical activity is therefore a basic, necessary intervention (Craig & Caterson, 1991, pp. 267-268) to be undertaken on a national scale. Before this intervention can be developed, there must be a clearer understanding of women's values concerning body

size, perceptions of weight and attitudes towards weight control. The results of this study show that social interventions to address obesity must be based on education designed to change the population's beliefs as far as the relationship between obesity on the one hand and status and health on the other is concerned.

Literature indicates that African American women are more focused on family relationships and the ability to look good rather than the concept of weight (Kumanyika, *et al.*, 1993). The data in this study also indicate that the respondent's perceptions are influenced by cultural and social factors. However, it may also be that these women have a culturally influenced view of body weight and may benefit from culturally relevant programs that help them link weight to health rather than to the dominant western standards of thinness.

Western methods commonly used to lose weight, such as eating deprivation and increased physical activity by vigorous exercise, need to be adapted to include cultural food patterns, cultural meanings of ideal weight, and increased physical activity in the daily routine.

Further research in this area should:

- include a wider age range in order to differentiate between women in different age categories.

- include both urban and rural women to differentiate between the views and opinions of these women.

- include a question relating to how the women perceive their own body image as represented by the photographs and then compare this with the actual BMI as determined using anthropometry.

"In a culture as technologically and medically oriented as this one, the knowledge of ordinary people is influenced by the knowledge of experts. In the case of obesity, overweight has become defined as a medical problem and health care professionals lay claim to be the recognized experts on body weight. Knowledge about obesity, therefore, like all other knowledge, reflects the complicated processes by which meanings are communicated from experts to ordinary people (Gorden & Tobias, 1984)".

REFERENCES

Abood, B.A., & Mason, M.A. 1997. Exploring racial differences in body dissatisfaction and eating attitudes and behaviours. American Journal of Health Studies, 13(3): 119.

Abrams, K.K., Allen, L.R., & Gray, J.J. 1993. Disordered eating attitudes and behaviors, psychological adjustment, and ethnic identity: A comparison of black and white female college students. International Journal of Eating Disorders, 14(1): 49-57.

Agell, A., & Rothblum, E.D. 1991. Effects of client's obesity and gender on the therapy judgements of psychologists. Professional Psychology Research and Practice, 22(3):223-228.

Akan, G.E., & Grilo, C.M. 1995. Socio-cultural influences on eating attitudes and behaviors, body image, and psychological functioning: A comparison of African-American, Asian-American, and Caucasian college women. International Journal of Eating Disorders, 18(2): 181-187.

Allan, J., Mayo, K., & Michel, Y. 1993. Body size values of white and black woman. Research in Nursing and Health, 16(4): 323-333.

Allon, N. 1979. Self perceptions of the stigma of overweight in relationship to weight-losing patterns. American Journal of Clinical Nutrition, 32(2): 470-480.

Allon, N. 1982. The stigma of overweight in everyday life. In: Wolman, B.B. (ed.). Psychological aspects of obesity. A handbook. New York: van Nostrand Reinhold.

Allport,G.W. 1935. Attitudes. In: Murchison (Ed.), A handbook of social psychology. Worcester, MA: Clark University Press.

Badenhorst, C., & Walker, A.R.P. 1994. Obesity: how can women in developing countries cope? The SA Jounal of Food Science and Nutrition, 6(3): 83-84.

Badura, B., & Kickbush. 1991. Health promotion research: towards a new social epidemiology. World Health Organisation, Compenhagen: WHO Regional Publications. 1991:191.

Bellisle, F., Monneuse, M.O., Teptoe, A., & Wardle, J. 1995. Weight concerns and eating patterns: A survey of university students in Europe. International Journal of Obesity, 19(10): 723-730.

Bjorntorp, P. 2001. Obesity – an overview of obesity as a disease with many risks for morbidity's. Continuing Medical Education, 19(8):552-556.

Bodystat R1500 - Bodstat®, Isle of Man, Limited

Bond, S., & Cash, T.F. 1992. Black beauty: Skin color and body images among African-American college women. Journal of Applied Social Psychology, 22(4):874-888.

Bourne, L.T., Langenhoven, M.L., Steyn, J., Jooste, P.L., Laubscher, J.A., Van der Vyver, E. 1993. Nutrient intake in the urban African population of the Cape Peninsula, South Africa. The Brisk study. The Central African Journal of Medicine, 3(4): 238-246.

Bradshaw, D., Bourne, D., Schneider, M., & Sayed, R. 1995. Mortality patterns of Chronic Diseases of Lifestyle in South Africa. In: Fourie, J. & Steyn, K. (ed.). Chronic Diseases of Lifestyle in South Africa. Medical Research Council, Tygerberg South Africa.

Brown, L. 1985. Women, weight and power: Feminist theoretical and therapeutic issues. Women and Therapy, 4(1): 61-71.

Brownell, K.D. 1991. Dieting and the search for the perfect body: Where physiology and culture collide. Behavior Therapy, 22(1): 1-12.

Bruch, H. 1985. Developmental obesity and schizoprenia. Psychiatry, 21(65): 195-198.

Burke, G.I., Jacobs, D.R., & Sprafka, J.M. 1990. Obesity and overweight in young adults: The CARDIA study. Preventative Medicine, 19:476-488.

Butler, J.C., & Ryckman, R.M. 1993. Perceived and ideal physiques in male and female university students. The Journal of Social Psychology, 133(5): 751-752.

Cash, T.F. 1985. Physical appearance and mental health. In: J. Graham & A. Kligman (eds.). Psychology of cosmetic treatments. New York: Praeger.

Cash, T.F., Winstead, B.A., & Janda, L.H. 1986. The great American shape-up. Psychology Today, 20(4): 30-37.

Cash, T.F., & Brown, T.A. 1987. Body image in anorexia nervosa and bulimia nervosa: A review of the literature. Behavior Modification, 11(4): 487-521.

Cash, T.F., & Pruzinsky, T. 1990. Body images: Development, deviance and change. New York: Guilford Press.

Cash, T.F., & Henry, P.E. 1995. Women's body images: The results of a national survey in the U.S.A. Sex Roles, 33(1-2): 19-28.

Cassidy, C. 1991. The good body: When big is better. Medical Anthropology, 13(3): 39-52.

Caterson, I. 1998. Overweight and Obesity. In: Mann, J. & Tuswell, A.S. (eds.). Essentials of Human Nutrition. 1st Edition. London: Oxford University Press.

Chabir, R., Khaldoune, J., Bour, A., Belahsen, L., Lahlou, H., Aguenaou, H., & Molchtar, N. 1998. Determination of anthropometric, biological, clinical and nutritional characteristics of obese women from an agricultural region from Morocco. International Journal of Obesity, 22:S212(Abstract P439).

Chang, K.S., Lee, M.M., & Low, W.D. 1966. Body type preferences and characteristics associated with attractive and unattractive bodies by African Americans and Anglo Americans. Sex Roles, 35 (5): 20-27.

Cogan, J.C., Bhalla, S.K., Sefas-Dedeh, A., & Rothblum, E.D. 1996. A comparison of United States and African students on perceptions of obesity and thinness. Journal of Cross-Cultural Psychology, 27(1): 98-113.

Cohn, L. D., & Adler, N.E. 1992. Female and male perceptions of ideal body shapes. Distorted views among Caucasion college students. Psychology of Women Quarterly, 16(1): 69-79.

Combs, A., & Snygg, D. 1991. Individual Behavior: A Perceptual Approach to Behavior. New York: Harpers & Brothers.

Compton, N.H., & Hall, O.A. 1974. Foundations of Home Economics Research. 2nd Edition. Burgess Publishing company: Minneapolis.

Conway, J.M., Yanovski, S.Z., Avila, N.A., & Hubbard, V.S. 1995. Visceral adipose tissue differences in black and white women. American Journal of Clinical Nutrition, 6(4): 765-771.

Cooper, Z. 1995. The development and maintenance of eating disorders. In: K.D. Brownell & C.G. Fairburn. (eds.). Eating disorders and obesity: a comprehensive handbook. New York: Guilford Press.

Cooper, P.J., & Taylor, M. J. 1988. Body image disturbance in bulimia nervosa. British Journal of Psychiatry, 153(2): 32-36.

Craig, P., & Caterson, I. 1991. Body size, age, ethnicity, attitudes and weight loss. In: Ailhaud, E. (ed.). Obesity in Europe. London: John Libbey & Company Ltd.

Dacosta, K., & Wilson, J. 1996. Food preferences and eating attitudes in three generations of black and white women. Appetite, 27(2): 183-191.

Darwin, C. 1874. The descent of man. London: John Murray.

Dawson, D. 1988. Ethnic differences in female overweight: Data from the 1985 National Health Interview Survey. American Journal of Public Health, 78(10): 1326-1329.

De Villiers, M.A., Albertse, E.C., & McLachlan, M.H. 1988. The prevalence of obesity and hypertension among Zulu women in a remote rural area. South African Journal of Science, 84(Jul): 601-602.

Desmond, S.M., Price, J.H., Hallinan, C., & Smith, D. 1989. Black and white adolescents' perceptions of their weight. Journal of School Health, 59(8): 353-358.

Dolan, B. 1990. Cross-cultural aspects of anorexia nervosa and bulimia: A review. International Journal of Eating Disorders, 10(1): 67-78.

Drewnowski, A. & Popkin, B.M. 1997. The nutrition transition: New trends in the global diet. Nutrition Reviews, 55(2): 31-43.

Edwards, A.L., & Kilpatrick, F.P. 1948. A technique of the construction of attitude scales. Journal of Applied Psychology, 32: 374-384.

Fair, T.D.J. 1985. The urbanzation process in South Africa. RSA 2000, Dialogue for the future, 7(1): 1-6.

Fairburn, C.G., & Wilson, G.T. 1993. Binge eating: Nature assessment, and treatment. New York: Guilford Press.

Fallon, A., & Rozin, P. 1985. Sex differences in perceptions of desirable body shapes. Journal of Abnormal Psychology, 94: 102-105.

Fallon, A. 1990. Culture in the mirror: Sociocultural determinants of body image. In: Cash, T.F., & Pruzinsky, T, (eds.), Body images: Development, deviance, and change. New York: Guilford Press.

Fernandez, F., Probs, M., Meerman, R., & Vandereycken, W. 1993. Body size estimation and body dissatisfaction in eating disorder patients and normal controls. International Journal of Eating Disorders, 16(3): 307-310.

Fisher, S., & Cleverland, S.E. 1958. Body image and personality. New York: Dover publications.

Furnham, A., & Alibhai, N. 1983. Cross-cultural differences in the perception of female body shapes. Pshychological Medicine. 13(4): 829-837.

Furnham, A., & Baguma, P. 1994. Cross- cultural differences in the evaluation of male and female body shapes. International Journal of Eating disorders, 15(1): 81-98.

Garfinkel, L. 1985. Overweight and cancer. Annuals of International Medicine, 103(6(part2)):1032-1036.

Garner, D.M., Garfinkel, P.E., Stancer, H.C., & Moldofsky, H. 1976. Body image disturbances in anorexia nervosa and obesity. Psychosomatic Medicine, 38(5): 327-336.

Garner, B.M., & Garfinkel, P.E. 1980. Socio-cultural factors in the development of anorexia nervosa. Psychological Medicine, 10(4): 647-656.

Garner, R.M., & Tockerman, Y.R. 1993. Body dissatisfaction as a predictor of body size distortion: A multidimensional analysis of body image. Genetic, Social, and General Psychology Monographs, 119(1): 125-145.

Gatewood, W.B., Jr. 1988. Aristocrats of color: South and North. The Black elite, 1880-1920. Journal of Southern History, 54(1): 3-20.

Gellert, E., Girgus, J., & Cohen, J. 1971. Children's awareness of their bodily appearance: A developmental study of factors associated with body precept. Genetic Psychology Monograph. 84(1): 109-174.

Glucksman, M.L., & Hirsch, J. 1969. The response of obese patients to weight reduction. III: the perception of body size. Comprehensive Psychiary, 31(1): 1-7.

Goldblatt, P.B., Moore, M.E., & Stundkard. A.J., 1965. JAMA:The journal of the American Medical Association, 192(12): 1039-1044.

Gordon, J.B., & Tobias, A. 1984. Fat, female and the life course: The development years. Marriage and Family Review, 7(1-2): 65-92.

Gore, S.V. 1999. African-American women's perceptions of weight: Paradigm shift for advanced practice. Holistic Nursing Practice, 13(4): 71-79.

Gray, J.J., Ford, K., & Kelly, L.M. 1987. The prevalence of bulimia in the black college population. International Journal of Eating Disorders, 6(1): 737-740.

Gray, S.H., 1977. Social aspects of body image: Perception of normalcy of weight and affect of college undergraduates. Perceptual and Motor Skills, 45(1): 1035-1040.

Greenberg, D.R., & La Porte, D.J. 1996. Racial differences in body type preferences of men for women. International Journal of Eating Disorders, 19(3): 275-278.

Grier, W.H., & Cobb, P.M. 1968. Black rage. 1st Edition. New York: Basic Books.

Gustavson, C.R., Gustavson, J.C., Pumariega, A.J., Reinarz, D.E., Dameron, R., Gustavson, A.R., Pappas, T., & McCaul, K. 1990. Body-image distortion among male and female college and high school students, and eating-disordered patients. Perceptual and Motor Skills, 71(3(part1)): 1003-1010.

Hammond, K.A. 2000. Dietary and Clinical Assessment. In: Mahan, L.K. & Escott-Stump, S. (ed.). Krause's Food, Nutrition & Diet Therapy. 10th Edition. Philadelphia: W.B. Saunders Company.

Han, T.S., Bijnen, F.C.H., Lean, M.E.J., & Seidell, J.C. 1998. Separate associations of waist and hip circumference with lifestyle factors. International Journal of Epidemiology, 27(3): 422-430.

Harris, M., & Smith, S. 1982. Beliefs about obesity: Effects of age, ethnicity, sex, and weight. Psyhological Reports, 51(3(part2)): 1047-1055, Dec.

Hesse-Biber, S.J. 1996. Am I Thin Enough Yet? In: The Cult of Thinness and the Commercialization of Identity. New York: Oxford University Press.

Hodge, A.M., Dowse, G.K., Gareeboo, H., Tuomilehto, J., Albert, K.G.M.M., & Zimmet, P.Z. 1996. Incidence, increasing prevalence and predictors of change in obesity and fat distribution over 5 years in the rapidly developing population of Mauritius. International Journal of Obesity, 20(2): 137-146.

Hoffman, M., Pick, W.M., Cooper, D., & Meyers, E. 1997. Women's health status and use of health services in a rapidly growing peri-urban area of South Africa. Social Science and Medicine, 45(1):149-157.

Hornby, A.S. 1989. Oxford Advanced Learner's Dictionary of Current English. 4thEdition. Oxford: Oxford University Press.

Hughes, M., & Hertel, B.R. 1990. The significance of color remains: A study of life chances, mate selection, and ethnic consciousness among Black Americans. Social Forces, 68(4): 1105-1120.

Hsu, G. 1987. Are Eating Disorders Becoming More Common among Blacks? International Journal of Eating Disorders, 6(1): 113-124.

Jacobs, S., & Wagner, M. 1984. Obese and non-obese individuals behavioral and personality characteristics. Addictive behavior, 9(2): 223-226.

Jalmeen, F., Makkar, D, & Strube, J.M. 1995. Black women's self perceptions of attractiveness following exposure to White versus Black beauty standards: The moderating role of racial identity and self-esteem. Journal of Applied Psychology, 25(17): 1547-1566.

James, W.P.T. 1992. Epidemiology of obesity. International Journal of Obesity, 16 (2):S23-S26.

Jooste, P.L., Steenkamp, H.J., Benade, A.J., & Rossow, J.E. 1988. Prevalence of overweight and obesity and its relation to coronary heart disease in the CORIS study. South African Medical Journal, 74(3):101-104.

Kalick, S. 1987. Toward an interdisciplinary psychology of appearance. Psychiatry, 41(1): 243-253.

Kalk, W.J. 2001. Epidemiology of obesity: Where do we stand in terms of obesity in South Africa? Continuing Medical Education, 19(8): 576-578.

Katcher, A., & Levin, M.M. 1955. Children's conceptions of body size. Child Development, 26: 103-110.

Kemper, K.A., Sargent, R.G., Drane, J.W., Valois, R.F., & Hussey, J.R. 1994. Black and white females' perceptions of ideal body size and social norms. Obesity Research, 2(2): 117-126.

Khan, B.B. 1996. Evidence for leptin binding to proteins in serum of rodents and humans: modulation with obesity. Diabetes, 45(2): 1638-1643.

Kim, S., Moon, S., & Popkin, B.M. 2000. The nutrition transition in South Korea. Journal of Clinical Epidemiology, 71(1):44-53.

King, I. 1981. A Theory for Nursing: Systems, Concepts, Process. 1st Edition. New York: John Wiley & Sons.

Klesges, R.C. 1983. An analysis of body image distortions in a non-patient population. International Journal of Eating disorders, 2(2): 35-41.

Kolb, C. 1959. Disturbances of body image. In: Arieti, S. (ed.). American Handbook of Psychiatry. 1st Edition. New York: Basic Books.

Krech, D., & Crutchfield, R.A. 1948. Theory and problems of social psychology. New York: McGraw-Hill.

Kruger, H.S., Van Aardt, A.M., Steyn, H.S. 1996. The Development of an attitude scale for assessment of body image of obese black women. S A Journal of Food Science and Nutrition, 8(3): 106-112.

Kruger, H.S., Van Aardt, A.M., Walker, A.R.P., & Bosman, M.J.C. 1994. Obesity in African hypertensive women: Problems in treatment. South African Journal of Food Science and Nutrition, 6(3): 103-107.

Kumanyika, S.K. 1987. Obesity in black women. Epidemiologic Reviews, 9:31-50.

Kumanyika, S.K., Wilson, J.F., & Guildford-Davenport, M. 1993. Weight related attitudes of black women. Journal of the American Dietetic Association, 93(4): 416-422.

Kumanyika, S.K. 1994. Obesity in minority populations: An epidemiologic assessment. Obesity Research, 2: 166-182.

Laquatra, I. 2000. Nutrition for Weight Management. In: Mahan, L.K. & Escott-Stump,S. (ED). Krause's Food, Nutriton & Diet Therapy. 10th Edition. Philadelphia: W.B. Saunders Company.

Lamb, C.S., Jackson, L.A., Cassiday, P.B., & Priest, B.J. 1993. Body figure preferences of men and women: A comparison of two generations. Sex Roles: A Journal of Reseach, 28(5): 345-358.

Lean, M.E.J., Han, T.S., & Morrison, C.E., 1998. Waist circumference as a measure for indicating need for weight management. British Medical Journal, 311(6998): 158-161.

Lee, S., Leung, T., Lee, A.M., Yu, M. & Leung, C.M. 1996. Body dissatisfaction among Chinese undergraduates and its implications for eating disorders in Hong Kong. International Journal of Eating disorders, 20(1): 77-84.

Lee, R.D., & Nieman, D.C. 1996. Nutrition Assessment. 2nd Edition, Madison: Brown & Benchmark Publishers.

Leitner, L.M., & Grant, C.H. 1982. Obesity, personal constructs and amounts of weight loss. Psychological Reports, 50(2): 491-498.

Le Grange, D., Telch, C., & Agras, W. 1997. Eating and general psychopathology in a sample of Caucasian and ethnic minority subjects. International Journal of Eating disorders, 21(3): 285-293.

Leon, G. 1982. Personality and behavior correlates of obesity in Woman. Psychological Aspects of Obesity, 50(2):491-498.

Levitt, N.S., Katzenellenbogen, J.M., Bradshaw, D., Hoffman, M.N., & Bonnici, F. 1993. The prevalence and identification of risk factors for NIDDM in urban Africans in Cape Town, South Africa. Diabetes Care, 16(4): 601-607.

Louw, D.A. 1995. Suid-Afrikaanse Handboek vir Abnormale Gedrag. 3de Uitgawe. Johannesburg: Southern Boekuitgewers.

Lew, E.A., & Garfinkel, L. 1979. Variations in mortality by weight among 750 000 men and women. Journal of Chronic Diseases, 32(8): 563-576.

MacIntyre, U.E. 1998. Dietary intakes of Africans in transition in the North-West Province (dissertation) Potchefstroom PU for CHE, 1-542.

Maddox, G.L., Back, K.W., & Liederman, V.R. 1968. Overweight as social deviance and disability. Journal of Health and Social Behavior, 4(9): 287-298.

Malina, R., Little, B., Stern, M., Gaskell, S., & Hazuda, H. 1983. Ethnic and social class differences in selected anthropometric characteristics of Mexican-American and Anglo adults: The San Antonio heart study. Human Biology, 55(4): 867-883.

Manson, J.E., Colditz, G.A., Stampfer, M.J., Willett, W.C., Rosner, B., Monson, R.R., Speizer, F.E., & Hennekens, C.H. 1990. A prospective study of obesity and risk of coronary heart disease in women. New England Medical Journal, 322(13): 882-889.

Mason, E.E., 1981. Surgical Treatment of Obesity. 1st Edition. Philadelphia: WB Saunders Company.

Massara, E. 1979. Que gordita! A study of weight among a Puerto Rican-community. Bryan Mawr PA:College.

Massara, E.B., & Stunkard, A.J., 1979. A method of quanitifying cultural ideals of beauty and the obese. International Journal of Obesity, 3: 149-152.

Matthews, V & Westie, C.A. 1966. Preferred method for obtained rankings: Reactions to physical handicaps. American Sociological Review, 31(6): 851-854.

Matangi, H., Swinburn, B., Craig, P., Matenga-Smith, T., & Vaughan, G. 1995. Do Pacific Islanders still believe that "Big is Beautiful"? Body size perceptions among Cook Islanders. Asia Pacific Journal of clinical Nutrition, 4(1): 368.

Matthews, V., & Westie, C.A. 1966. Preferred method for obtained rankings: Reactions to physical handicaps. American Sociological Review, 31(6): 851-854.

McBride, A. 1988. Fat: A women's issue in search of a holistic approach to treatment. Holistic Nursing Practice, 3(1): 9-15.

McCaulay, M., Mintz, L., & Glenn, A.A. 1988. Body image, self-esteem, and depression-proneness: Closing the gender gap. Sex Roles, 18:381-391.

Melnyk, M.G. & Weinstein, E. 1994. Preventing obesity in black women by targeting adolescents: A literature review. Journal of the American Dietetic Association, 94(5): 536-554.

Messer, E. 1989. Small but healthy? Some cultural considerations. Human Organization, 48(1): 39-52.

Meyer, B.J., & Van der Merwe, M., 1987. Vetsug. Geneeskunde, 29(8): 231-233.

Molefi, K. 1988. Afrocentricity. New revied. Trenton: Africa World Press.

Mollentze, W.F., Moore, A.J., Steyn, A.F., Joubert, G., Steyn, K., Oosthuizen, G.M., & Weich, D.J.V. 1995. Coronary heart disease risk factors in a rural and urban Orange Free State black population. South African Medical Journal, 85(2): 90-96.

Monteath, S.A., & McCabe, M.P. 1997. the influence of societal factors on female body image. The Journal of Social Psychology, 137(6): 708-727.

Monteiro, C.A., Mondini, L., de Souza, A.L., & Popkin, B.M. 1995. The nutrition transition in Brazil. European Journal of Clinical Nutrition, 49(2): 105-113.

Mvo, Z. 1999. Perceptions of overweight African women about acceptable body size of women and children. Curationis, 22(2): 27-31(Jun).

Myers, P.N., Biocca, F.A. 1992. The elatic body image: The effect of television, advertising and programming on body image distortions on young women. Journal of Communication, 42(3): 108-134.

Nasser, M. 1988. Culture and weight consciousness. Journal of Psychosomatic Research, 32(6): 573-577.

National Center for Health Statistics. 1990. Health United States, Washington, DC: US Dept of Health and Human Services, Public Health Service, Centers for Disease Control, 1991. DHHS (PHS) publication 91-1232.

Ndlovo, P.P., & Roos, S.D. 1999. Perceptions of black women of obesity as a health risk. Curationis, June: 47-53.

Neal, A.M., & Wilson, M.L. 1989. The role of skin color and features in the Black community: Implications for Black women and therapy. Clinical Psychology Review, 9(3): 323-333.

Nel, S.J. 1978. Die ontwikkeling van 'n skaal vir die bepaling van die houding van eerstejaarstudente aan Afrikaansmedium universiteite teenoor die natuurwetenskap en natuurwetenskaplikes. Pothefstoom (Proefskrif, D.Ed.), PU vir CHO.

Newcombe, R.G. 1998. Interval estimation for the difference between independent proportions. A comparative evaluation of eleven methods. Statistics in Medicine, 17(8):873-890.

O'Dea, J.A. 1995. Body image and nutritional status among adolescents and adults – a review of the literature. Australian Journal of Nutrition and Dietetics, 52(2): 56-67.

O'Dea, J.A. 1998. The body size preferences of underweight young women from different cultural backgrounds. Australian Journal of Nutrition and Dietetics, 55(2): 75-80.

Offer, D., Ostrov, E., & Howard, K. 1981. The adolescent: a psychological self-portrait. 1st Edition. New York: Basic Books.

Okazawa-Rey, M., Robinson, T., & Ward, J.W. 1987. Black women and the politics of skin color and hair. Women and Therapy, 6(1-2): 89-102.

O'Rourke, T., Smith,B.J., & Nolte, A.E. 1984. Health risk attitudes, beliefs and behaviors of students grades 7-12. Journal of School Health, 54(1): 210-214.

Parker, S., Nichter, M., Vuckovic, N., Sims, C, & Ritenbach, C. 1995. Body Image and Weight concerns among African American and White Adolescent females: Differences that makes the difference. Human Organization, 54(2): 103-114.

Parnell, K., Sargent, S., Thompson, S.H., Duhe, S.F., Valois, R.F., & Kemper, R.C. 1996. Black and white adolescent females' perceptions of ideal body size. Journal of School Health, 66(3): 112-118.

Pate, J.E., Pumariega, A.J., Hester, C., & Garner, D.M. 1992. Cross-cultural patterns in eating disorders: A review. Journal of the American Academy of Child and Adolescent Psychiatry, 31(5): 802-809.

Pinkowish, M. 1995. Eating disorders: No stereotypes need apply. Patient Care, 29(18): 13.

Pi-Sunyer, F.X., & Albu, J. 1999. Fat distribution and health risks in differing racial/ethnic groups. Paper presented at the 21st international Symposium of the Swedish Nutrition Foundation, August 26-28 1999, Ystad, Sweden.

Polivy, J.D., Garner, D.M., & Garfinkel, P.D. 1986. Causes and consequences of the current preference for thin female physiques. In: C.P. Herman, M. P. Zanna, & E.T. Higgins (Eds.), Physical appearance, stigma and social behavior: The Ontario symposium (Vol.3). Hillsdale, Nj: Erlbaum.

Popkin, B.M. 1998. The nutrition transition and its health implications in lower-income countries. Public Health Nutrition, 1(1): 5-21.

Popkin, B.M., Strega-Riz, A.M., & Haines, P.S. 1996. A comparison of dietary trends among racial and socio-economic groups in the United States. The New England Journal of Medicine, 335(10): 716-720.

Powers, P.S. 1980. Obesity: The regulation of weight. 1st Edition. Baltimore: Williams & Wilkins.

Powers, P.S. 1988. Social Issues in Obesity. In: Burrows, G., Beaumont, P.J.V., Castper, R.C., (Eds) Handbook of Eating Disorders: Part 2: Obesity. Amsterdam: Elsevier. pp 6-16.

Powers, P.S. 1996. In the eye of the beholder. Human Ecology, 24(4): 16-20.

Prentice, A.M. 1997. Obesity: the inevitable penalty of civilization? British Medical Bulletin, 53(2): 229-237.

Prentice, A.M. 2000. Epidemic obesity and diabetes in developing countries. Paper presented at the symposium "Obesity in Poverty and Affluence", hosted by the South African Sugar Association, CSIR, Pretoria, February 2000.

Rand, C., & Kaldau, J. 1990. The epidemiology of obesity and self-defined weight problems in the general population: Gender, race, age, and social class. International Journal of Eating Disorders, 9(3): 329-343.

Ravussin, E. 2000. Beyond sloth and gluttony: Physical activity and weight gain. Paper presented at the symposium "Obesity in Poverty and Affluence", hosted by the South African Sugar Association, CSIR, Pretoria, February 2000.

Reitman, E.E., & Cleverland, S. 1964. Changes in body image following sensory deprivation in schizophrenic and control groups. Journal of Abnormal and Social Psychology, 68:168-176.

Richardson, S.A., Goodman, N., Hastorf, A.H., & Dornbusch, S.M. 1961. Cultural uniformity in reactions to physical handicaps. American Sociological Review, 26(1): 241-247.

Rittenbauch, C. 1982. Obesity as a culture bound syndrome, Culture Medical Psychiatry, 6(4): 347-364.

Robins, S.P. 1990. Organizational Behavior. 5th Edition. New Jersey, USA: Prentice Hall.

Root, M.P.P. 1990. Disordered eating in women of color. Sex Roles, 22(7): 525-536.

Rosen, E.F., Anthony, D.L., Booker, K.M., Brown, T.L., Christian, E., Crews, R.C., Hollins, V.J., Privette, J.T., Reed, R.R., & Petty, L.C. 1991. A comparison of eating disorder scores among African-American and White college females. Bulletin of the Psychonomic Society, 29(1): 65-66.

Rozin, P., & Fallon, A. 1988. Body image, attitudes to weight, and misperceptions of figure preferences of the opposite sex: A comparison of men and women in two generations. Journal of Abnormal Psychology, 97:342-345.

Rosen, J.C., & Gross, J. 1987. Prevalence of weight reducing and weight gaining in adolescent girls and boys. Health Psychology, 6(2): 131-147.

Rucker, C.E., & Cash, T.F. 1992. Body images, body-size perceptions, and eating behaviors among African American and white college women. International Journal of Eating Disorders, 12: 291-299.

Schilder, P.R. 1935. The image and appearance of the Human Body. 1st Edition. London: Kegan Paul.

Schulken, E.D., Pinciaro, P.J., Sawyer, R.G., Jensen, J.G., & Hoban, M.T. 1997. Sorority women's body size perceptions and their weight-related attitudes and behaviours. Journal of American College Health, 46(2): 69-74.

Schumaker, J.F., Krejci, P., Small, L., & Sargent,R. 1985. Experience of loneliness by obese individuals. Psychological Report, 57(3(part 2)): 1147-1154.

Sears, D.O., Peplau, L.A., & Taylor, S.E. 1991. Social Psychology. 7th Edition. New Jersey: Prentice Hall.

Second, P.R. 1953. Objectification of word association procedures by the use of homonyms: A measure of body cathexis. Journal of Personality, 21: 479-495.

Seedat, Y.K., Mayet, F.G.H., Khan, S., Somers, S.R., & Joubert, G. 1990. Risk factors for coronary heart disease in the Indians of Durban. South African Medical Journal, 78(8): 447-454.

Seidell, J.C., Ciglioni, M., Charzwska, J., Ellsinger, B.M., Deslypere, T.P., & Cruz, A. 1992. Fat distribution in European men: a comparison of anthropometric measurements in relation to cardiovascular risk factors. International Journal of Obesity, 16(1):17-22.

Senekal, M. 1988. Factors related to weight gain experienced by first year female students at the University of Stellenbosch. M Nutrition Thesis, University of Stellenbosch: Stellenbosch.

Senekal, M., Steyn N.P., Mashego, T.B., & Nel, J.H., 2001. Evaluation of body shape, eating disorders and weight management related parameters in black female students of rural and urban origins, South African Journal of Psychology, 31(1): 45-53.

Serdula, M.K., Collins, M.E., Williamson, D.F., Anda, R.P., Pumak, E.R., & Byers, T.E. 1993. Weight-related attitudes and behaviors of black women. Journal of the American Dietetic Association, 93(4): 416-422.

Slabber, M.S., Laubscher, M., Van den Heever, C., & Joubert, G. 2000. Ideals and perceptions of body size of first year female student's at the UOFS. Paper presented as the 36th SEMDSA congress, Durban, 2-7 April 2000.

Slabber, M.S., Walsh, C.M., Venter, F.C., & Bester C.J. 2003. A method for determine perceptions of body size in black South African women. Submitted for publication: International Journal of Obesity, Nov 2002.

Smith, I. 1989. Black and White Adolescents' Perceptions of Their Weight. Journal of School Health, 59(8): 353-358.

Sobal, J., & Stunkard, A. 1989. Socioeconomic status and obesity: A review of the literature. Psychological Bulletin, 105(2): 260-275.

Sobal, J. 1991. Obesity and socioeconomic status: A framework for examining relationships between physical and social variables, Medical Anthropology 13(3): 231-248.

Stanhope, M., & Lancaster, J. 1988. Community Health Nursing: Process and Practice for Promoting Health. Second Edition. St. Louis: CV Mosby.

Stephenson, M., Levy, A., Sass, N., & MacGarvey, W. 1987. 1985 NHIS findings: Nutrition knowledge and baseline data for the weight-loss objectives. Public Health Reports, 102(1): 61-67.

Stevens, J., Kumanyika, S.K., & Keil, J.E. 1994. Attitudes toward body size and dieting: Differences between elderly black and white woman. American Journal of Public Health, 84(8): 1322-1325.

Steyn, K., Jooste, P.L., Bourne, L.T., Fourie, J., Badenhorst, C.J., Bourne, D.E., Langenhoven, M.L., Lombaard, C.J., Truter, H. & Katzenellenbogen, J. 1991. Risk factors for coronary heart disease in the black population of the Cape Peninsula.The BRISK study. South African Medical Journal, 79(8):480-485.

Stice, E., & Shaw, H.E. 1994. Adverse effects of the media portrayed thin-ideal on women and linkages to bulimic symptomatology. Journal of Social and Clinical Psychology, 13(3): 288-308.

Story, M., French, S.A., Resnick, M.D., & Blum, R.W. 1995. Ethnic/ racial and socio-economic differences in dieting behaviors and body perceptions in adolescents. International Journal of Eating Disorders, 18(2): 173-179.

Stiegel-Moore, R.H., Schreiber, G.B., Pike, K.M., Wilfley, P.E. & Rodin, J. 1995. Drive for thinnes in black and white pre-adolescent girls. International Journal of Eating Disorders, 18(1): 59-69.

Stunkard, A.J., Sorenson, T., & Schulsinger, F. 1983. Use of the Danish adoption register for the study of obesity and thinness. In: S. Kety (Ed), The genetics of neurological and psychiatric disorders. New York: Raven Press.

Stundkard, A.J., & Sorensen, T.A. 1993. Obesity: Theory and Therapy, 2nd Edition. New York: Raven Press Ltd.

Tait, D.C., & Acher, P.C. 1955. Inside the body test. Psychosomatic medicine, 17: 139-148.

Thomas, V.G., & James, M.D. 1988. Body image, dieting tendencies, and sex role traits in urban Black women. Sex Roles, 18(9) 523-529.

Thompson, J.K., & Altabe, M.N. 1991 Psychometric qualties of the Figure Rating schale. International Journal of Eating Disorders, 10: 615-619.

Thompson, J.K., Fabian, L.J., Moulton, D.O., Dunn, M.E., & Altabe, M.N. 1991. Development and validation of the Physical appearance related testing scale. Journal of Personality Assessment, 56(3): 513-521.

Thompson, J.K. 1995. Assessment of body image. In: D. Allison (Ed), Methods in the assessment of eating and shape-related problems. New York: Sage.

Thompson, S.H., Sargent, R.G., & Kemper, K.A. 1996. Black and white adolescent males' perception of ideal body size. Sex Roles, 34(5): 391-406.

Toriola, A.L., Dolan, B.M., Evans, C., & Adetimole, O. 1996. Weight satisfaction of Nigerian women in Nigeria and Britain: Inter-generational and cross-cultural influences. European Eating Disorders Review, 4(2): 84-94.

Van der Merwe, M.T., Panz, V.R., Crowther, N.J., Schlaphoff, G.P., Gray, I.P., Froguel, P., Joffe, B.I., & Lonnroth, P.N. 1999. Free fatty acids and insulin levels – relationship to leptin levels and body consumption in various patient groups from South Africa. International Journal of Obesity, 23(9):909-917.

Villarosa, L. 1994. Dangerous Eating. Essence, Jan: 19-21.

Wadden, T.A., Stunkard, A.J., & Liebschutz, J. 1988. Three-yeard follow-up of the treatment of obesity by very low calorie diet, behavior therapy, and their combination. Journal of Consulting and clinical Psychology, 56(6): 925-928.

Walker, A.R. P., & Segal, I. 1997. Health/ill-health transition in less privileged populations: what does the future hold? Journal of the Royal College of Physicians of Londen, 31(4):392-395.

Walker, A.R.P. 1995. Epidemiology and health implications of obesity in Southern Africa. In: Fourie, J. & Steyn, K. (ed.). Chronic diseases of Lifestyle in South Africa, Medical Research Council, Tygerberg South Africa.

Walker, A.R.P. 1995. Changing views on the treatment of obesity. Journal for Dietetics and Home Economics, 23(3):157-163.

Walker, A.R.P. 1995. Epidemiology and health implications of obesity in Southern Africa. In: Fourie, J., & Steyn, K. (ed.). Chronic Diseases of Lifestyle in South Africa, Medical Research Council, Tygerberg South Africa.

Wardle, J., & Marsland, L. 1990. Adolescent concerns about weight and eating: A social-developmental perspective. Journal of Psychosomatic Research, 34(4): 377-391.

Weich, D.J.V. 1995. Coronary heart disease risk factors in a rural and urban Orange Free State black population. South African Medical Journal, 85(2):90-96.

Wilfley, D.E., Schreiber, G.B., Pike, K.M., Striegel-Moore, R.M., Wright, D.J. & Rodin, J. 1996. Eating disturbance and body image: A comparison of a community sample of adult black and white women, International Journal of Eating Disorders, 20(4): 377-387.

Wilson, D.B., Sargent, R., & Dias, J. 1994. Racial differences in selection of ideal body size by adolescent females. Obesity Research, 2(1): 38-43.

Wineman, N. 1980. Obesity; Locus of control, body image, weight loss and age-at-onset. Nursing Research, 29 (4): 231-236.

Wittreich, W.J. 1953. Aniseikonia and distortion of self image. American Psycologist, 8: 457-458.

Woods, N.F. 1991. The research agenda model as a framework for research about women and nutrition. American Journal of Health Promotion, 5(1): 222-225.

Worsley, A. 1981. In the eye of the beholder: social and personality characteristics of teenagers and their impressions of themselves and fat and slim people. British Journal of Medical Psychology, 54(1): 231-242.

Wright, E.J., & Whitehead, T.L. 1987. Perceptions of body size and obesity: A selected review of the literature. Journal of Community Health, 12(2): 117-127.

Yach, D., Matthews, C., & Buch, E. 1990. Urbanization and health: methodological difficulties in undertaking epidemiological research in developing countries. Social Science and Medicine, 31(4):507-514.

Zion, L. 1965. Body concept as it relates to self-concept. Research Quarterly, 36(4): 490-495.

Central University of Technology, Free State

Title page

Title: A method for determining perceptions of body size in black South African women

Running title: Method determine perceptions in black SA women

Authors: Marthinette Slabber, Corinna M Walsh, Francina C Venter, Catharina J Bester

Institutions: Departments of Human Nutrition, and Biostatistics, University of the Free State, and School of Tourism, Hospitality and Sport, Technikon Free State, Bloemfontein, South Africa.

No disclaimers

Corresponding author: Professor Marthinette Slabber, Department of Human Nutrition(G24), Faculty of Health Sciences, University of the Free State, PO Box 339, University of the Free State, 9300 Bloemfontein. South Africa.

e-mail:gnmvms@med.uovs.ac.za

Tel: +27 51 4013316

Fax: +27 51 4012869

Reprints available from: Professor Marthinette Slabber, Department of Human Nutrition (G24), Faculty of Health Sciences, University of the Free State, PO Box 339, University of the Free State, 9300 Bloemfontein. South Africa.

e-mail:gnmvms@med.uovs.ac.za

Abstract and key words

Background: Obesity amongst black South African women is evolving. Perceptions for body size are culturally determined and lack of perception about obesity may cause obese people to be less inclined to follow weight loss programs.

Objective: To devise a tool to ı ınation of perceptions of body size and community attitudes towards body size, and also quantifying cultural ideals of beauty and health in black South African women.

Methods: A series of five photographs, based on the distorting photograph technique, were devised to represent BMI's of respectively underweight (<18.5k g/m^2), lower normal weight (18.5-19.9 kg/m^2), normal weight (20.0-24.9 kg/m^2), overweight 25-29.9 kg/m^2) and obesity (≥30 kg/m^2). For validation, 21 experts had to assign a BMI to each photograph. The questionnaire was administered to a random sample (n=500) of black women. To determine reliability, questions were repeated between 1-4 wks after the first study on a random sample (n=49) of women. Answers of both surveys were compared and questions were considered unreliable if conflicting answers exceeded 20%.

Results: The experts estimated mean BMI-average respectively as 17 kg/m^2 (14.7-19.3 kg/m^2), 19.9 kg/m^2 (17.8-22.0 kg/m^2), 24 kg/m^2 (21.1-26.9 kg/m^2), 28.6 kg/m^2 (25.3-31.9), and 35.9 (29.6-42.2) thus proving validity. Three questions proved unreliable and were excluded.

Conclusion: The tool may be used as valid and reliable method to quantify perceptions of black South African women of body size.

Key words: Obesity; black South African women; perception: body size.

Introduction

Obesity is associated with chronic diseases of lifestyle such as hypertension, stroke, diabetes, cardiovascular disease and some cancers[1]. Furthermore, other disease states are being complicated by the presence of obesity. Westernisation and urbanisation in black South Africans have led to a nutrition transition and epidemiological evidence of increasing problems of obesity and its related diseases especially amongst black South African women is evolving[2]. The proportion obese among African women is double that than in white women, and as high as that among Afro-American women[2].

People, who correctly perceive their body size to be undesirably large from the viewpoint of medical risk, may to a greater extend to lose excess body weight. However, some obese people may be less inclined to follow weight loss programs because of lack of perception about obesity. Perceptions towards body size are influenced by many social, cultural and economic factors. Several researchers[3-5] have pointed out that perceptions (of especially women) for body size and preferences for levels of fatness are culturally determined. Evidence exists that obesity and overweight are socially desirable in some cultures[6] and also symbolise beauty[7] and wealth[8] in several non-Western cultures. Stevens and co-workers[5] found striking differences between elderly African-American and white women regarding body size perceptions. African-American women seemed to be more satisfied with their body size than were white women[5]. Male and female Ugandan students also found obese figures more attractive and healthy than did their British counterparts[6]. Euro-American women are possibly pressurised to be thin, as their men prefer slimmer body types[9]. In contrast it has been reported that black women in South Africa view

obesity as a normal state of health and co-workers[11] found that black South African women from Khayelitsha were not put under any social pressure to lose excess weight. However, more realism concerning weight status and assimilation of Western cultural norms regarding body shape were found among black female students in South Africa[12]. In order to implement effective health care strategies including weight loss programs in black South African women, the perceptions towards body size of the target population should be understood.

Several tools have been developed to the assessment of body image including visual perceptions[13-15], questionnaires[5,16-17] and interviewing techniques[18]. These methods are used widely in cognitive psychological assessment of body image. However, many of these methods were developed for sophisticated communities. The South African society is comprised of varied subcultures with unique values and physical characteristics. Families and communities seem to play a significant role in influencing standards of appropriate body size[5,19]. It was recently stated that the protection of body image perceptions and maintenance of effective weight management practices should be priorities in programmes aimed at those with rural origins[12]. To our knowledge no visual tool has been developed for use in black South African women. Thus, the aim of this study was to devise a tool to using in the determination of perceptions of body size and community attitudes towards body size, and also quantifying cultural ideals of beauty and health in black South African women.

Methods

Using a modification of the distorting photograph technique[20] a graded set of photographs with calculated BMI's was developed. A black female volunteer with a known body mass index that fell within the normal range (22.7 kg/m^2) was photographed. The picture was scanned and then distorted by using the computer program L View Pro© (1993-1996) to produce images that are both thinner and thicker than the original one. The height of the figure stayed the same while the breadth was resized. Only the part of the body below the neck is shown. To eliminate cues created by shadows around the silhouettes, the spaces were painted black using Photo Paint© computer software (Coral Draw 8, Kodak Digital Science ICC API, Copyright 1995-1997, Eastman Kodak Company version 8.232, Coral Corporation). In order not to reduce or enlarge the size of the figures beyond reality, only five photographs were used instead of the entire series. The five photographs (Fig 1) were selected to produce images of a range of five BMI's namely underweight (<18.5 kg/m^2), a lower range of normal weight (18.5-19.9 kg/m^2), a higher range of normal weight (20-24.9 kg/m^2), overweight (25-29.9 kg/m^2) and obese (≥30 kg/m^2).

To validate the set of photographs, it was shown in random order to 21 experts in the Free State who had to assign a BMI-value to each photograph. An expert was defined as a registered dietician who had treated underweight, overweight and obese patients for more than one year in a private practice or hospital setting. Validation of the photographs, which each had a lower and upper range (except for underweight and obese) were done by 95% limits of agreement to measure how close 95% of all

experts would be in the dissipatic upper range for the BMI of the photograph.

The reliability study was undertaken as part of a larger study that investigated the nutritional health of 500 pre-menopausal black women in Mangaung in the Free State in 2000. In the larger study a random sample of 250 women aged 25-34 years and 250 women aged 34-44 years was selected using a Mangaung township map. The women were selected out of two informal settlements (Joe Slovo and Namibia) and two formal settlements (Phameng and Botschabela). All women gave informed written consent to participate in the study. Every week 20 women were transported to the Technikon Free State Research Unit and the set of photographs was administered during individual interviews. One trained researcher conducted all the interviews and completed the questionnaires with the aid of a Sotho interpreter. The five photographs were placed randomly at eye level to the respondent. While viewing the photographs the researcher interviewed the respondent using a structured questionnaire (Table II). The respondent was requested to indicate the body size that best represent healthy, attractive body, normal (acceptable) body size, fat (overweight, obese), and too slim (underweight) respectively. Then, by showing the photographs that represent the underweight (BMI<18.5) and obese (BMI>30) women respectively to the respondent, questions to determine the respondent's perception of how her community treats its overweight and underweight members were asked. The researcher recorded the answers.

To evaluate reliability of the results, a random sample of 50 women (20%) from the original sample was selected to be interviewed again after 1-4 weeks after the first

interview. One woman was exclu | the information of 49 women was used for the reliability study. The Ethics Committee of the Faculty of Health Sciences, University of the Free State approved the study.

Statistical analyses

Statistical analyses were done by the Department of Biostatistics using the Statistical Analysis System[21]. The number and percentage of experts who classified the photographs correctly and incorrectly were calculated for each photograph and the BMI that they assigned to each photograph was described by the mean and standard deviation. 95% Confidence intervals were also calculated[22]. The reliability of the results was evaluated by comparing the answers obtained from the two surveys. Questions, of which the percentage of conflicting answers exceeded 20%, were considered as unreliable.

Results

The classification of photographs by experts is summarised in Table I. As randomly placed, photographs 1 through 5 represented respectively BMI-ranges of 25.0-29.9, 18.5-19.9, 20.0-24.9, ≥30 and <18.5. All experts classified the photographs in the correct order. The experts estimated the BMI average (95% limits of agreement) for photograph 1 as 17 (14.7-19.3); photograph 2 as 19.9 (17.8-22.0), photograph 3 as 24 (21.1-26.9), photograph 4 as 28.6 (25.3-31.9), photograph 5 as 35.9 (29.6-42.2). The 95% confidence intervals for the mean indicate that for all photographs except photograph 2, the mean value assigned by experts is expected to be within the correct range. What must be noted is the number that differs more than 0.1 (Table I). For example, for photograph 2, seven experts rated the BMI correctly to fall within the range of 18.5-19.9. Eight experts rated the BMI of photograph 2 as 20.0, thus differing from the upper limit of 19.9 by 0.1. Only six experts rated the BMI of photograph 2 higher than 20.0 and differed by more than 0.1. The maximum difference (all from the same expert) was 2.1 for photographs 2, 3 and 4. The maximum difference between the upper limit of agreement and the upper range of a photograph was 2.1 for photograph 2.

The reliability of questions on body size perception is summarised in Table II. The percentage differing of three questions rated over 20% and these questions were considered unreliable. The results of the larger study will be dealt with in a separate article.

Table 1 Classification of photos by experts (n=21)

BMI	Photograph 1 (<18.5 kg/m^2)	Photograph 2 (18.5-9.9kg/m^2)	Photograph 3 (20.0-24.9 kg/m^2)	Photograph 4 (25.0-29.9 kg/m^2)	Photograph 5 (≥30 kg/m^2)
Number correct	20 (95%)	7 (33%)	14 (67%)	14 (67%)	21 (100%)
Number incorrect	1 (5%)	14 (67%)	7 (33%)	7 (33%)	0
Number that differs with more than 0.1 kg/m^2	0	6 (28.6%)	2 (9.5%)	2 (9.5%)	0
Maximum difference*	0	2.1	2.1	2.1	0
Average	17	19.9	24	28.6	35.9
Standard deviation	2.3	1.05	1.45	1.63	3.15
95% Confidence interval	15.9; 18.1	19.4; 20.4	27.9; 29.3	23.3; 24.7	34.5; 37.3
95% Limits of agreement	14.7; 19.3	17.8; 22.0	21.1; 26.9	25.3; 31.9	29.6; 42.2

* The same expert

** Range within which 95% of all experts will classify this photo

Table 2 Body size perception ques ntage differing on repetition

Questions	% differing
1. Which person looks the healthiest?	14.2
2. Which person's body is the most attractive?	14.2
3. Indicate which photos belong to the next categories:	
A Female fat (overweight).	10.2
B Female normal (acceptable).	4.1
C Female slim (underweight).	4.1
4 What is the reaction of your community towards somebody that looks like photograph 5*?	
A Think they are rich.	10.2
B Think they are healthy.	6.1
C Think they are attractive.	8.2
D Think they are the same as other people.	8.4
E Think they are lazy and do not like them.	22.5
F Avoid them socially.	36.7
G Laugh at them.	18.4
5 What is the reaction of your community towards somebody who looks like photograph 1**?	
A Think they are rich.	4.1
B Think they are healthy.	6.1
C Think they are attractive.	8.1
D Think they are the same as other people.	14.3
E Think they are lazy and do not like them.	12.2
F Avoid them socially.	38.8
G Laugh at them.	20.4

* Photograph 5 – obese body size ** Photograph 1 – underweight body size

Discussion

In this study a tool for the objective measurement of black South African women's perceptions of body size and community attitudes towards body size was developed. The computer program used to develop our tool is a relatively simple and quick technique to produce a series of distortions of a scanned photograph. An expert panel of registered dieticians assigned a specific BMI to each photograph. Photograph 2 that represents the BMI of the lower range of normal weight (18.5 – 19.9 kg/m^2) showed the highest incorrect ratings by the experts with six experts that differed by more than 0.1. However, the BMI ranges represented by photograph 2 (lower range of normal weight) and that of photograph 3 ("higher range of normal weight") are still within the normal weight range as classified by the World Health Organisation (WHO)[23]. The photographs thus proved to be valid reproductions of the BMI's that they were intended to portray.

Limitations of this method of producing images should however be recognised. If the body size is enlarged horizontally to a greater extend than that of our Photo 5, without changing the height, the photographic image seems unreal. All the different grades of obesity as generally classified[23] could thus not be represented and our range of photographs included only one obese image that we classified as BMI $\geq$ 30 kg/m^2. Furthermore, this method relies on an image of the whole body and introduces an equal amount of distortion to all body parts. Our photographic images of body size, like most other techniques, includes only the one view (frontal view) and does not allow subjects to form a holistic picture of the body. To show all other views of

different body sizes will implicate n aphic images. This will extend the test and subjects may lose interest.

Reliability of a research tool refers to the consistence with which measuring instrument yields a certain result when the entity being measured has not changed[24]. The degree of consistency can be measured by several different methods. Collins[13] remarked that reliability data are rarely reported for measures of body image. Garner and Garfinkel[25] reported self-estimates using distorting photographs after one week of 0.75 for anorexics and 0.45 for controls. In our study the reliability data showed that most measures were stable over time. To keep the test relatively simple we kept our questionnaire short. Kruger and co-workers[26] remarked that when an attitude scale has a limited number of statements, it becomes increasingly difficult to obtain a good reliability and construct validity. Only three questions in the structured questionnaire were proved unreliable and were not used in the larger study. Body sizes that the respondents perceived as most healthy, most attractive, fat, normal and slim were consistent and confirmed as reliable to use with the photographs in our study population. The question "Think they are lazy and do not like them" (4e and 5e) had to be eliminated as two concepts were asked in the same question and gave rise to conflicting answers. Confusion also arose with the question "laugh at them" as it was often interpreted as "to laugh with them". Furthermore, the statement "avoid them socially" seemed to be a culturally unacceptable concept in our sample population. Even though interpreters were used, differences in cultural concepts seemed to be the main reason why some questions in the questionnaire are unreliable and should be excluded in future studies among black South African women.

Conclusions

A valid and reliable tool, specifically to provide quantitative information on perceptions of body size of black South African women was developed. The photographs being validated may also be utilized in future body image studies among black South African women in which subjects could be asked to indicate the body size that best represents their actual and preferred body size. Understanding the individual's perception of his/her own body size and the community's attitude towards obesity might provide insight to the health professional when preventive interventions are planned.

Acknowledgements

The research was partially supported by a grant from the National Research Foundation, South Africa.

The researchers would like to thank personnel of the Department of Biophysics, Faculty of Health Sciences and the Graphics Department, Center for Higher Education Studies and Development, University of the Free State with the assistance to producing the set of photographs.

247 **References**

248

249 1. Jansen I, Heymsfield SB, Allison DB, Kotler DP, Ross R. Body mass index and
250 waist circumference independently contribute to the prediction of nonabdominal,
251 subcutaneous, and visceral fat. Am J Clin Nutr 2002; **75**: 683-688.
252 2. Walker ARP.Nutrition-related dieseases in Southern Africa: with special reference
253 to urban African populations in transition. Nutr Res 1995; **15**: 1053-1094.
254 3. Kumanyika S, Wilson J,Guilford-Davenport M. Weight-related attitudes and
255 behaviors of black women. J Am Diet Assoc 1993;93:416-422.
256 4. Allen JD, Mayo K, Michel Y. 1993. Body size values of white and black women.
257 Res Nurs Health 1993; **16**: 323-333.
258 5. Stevens J, Kumanyika SK, Keil JE. Attitudes toward body size and dieting:
259 differences between elderly black and white women. Am J Public Health 1994;
260 **84**: 1322-1325.
261 6. Furnham A, Baguma P. Cross-cultural differences in the evaluation of male and
262 female body shapes. Int J Eat Disord 1994; **15**: 81-89.
263 7. Nasser M. Culture and weight consciousness. J Psycom Res 1988; **32**: 573-577.
264 8. Cogan JC, Bhalla SK, Sefa-Dedeh A, Rothblum ED. A comparison of United
265 States and African students on perceptions of obesity and thinness. J Cross-
266 Cultural Psychol 1996; **27**: 98-113.
267 9. Greenberg DR, LaPorte DJ. Racial differences in body type preferences of men
268 for women. Int J Eat Disord 1996; **19:** 275-278.
269 10. Kruger HS, Van Aardt AMN, Walker ARP, Bosman MJC. Obesity in African
270 hypertensive women: problems in treatment. S Afr J Food Sci Nutr 1994; **6**: 103-
271 107.

11. Mvo Z, Dick J, Steyn K. Perc ight African women about acceptable body size of women and children. Curationis 1999; **22**: 27-31.

12. Senekal, M, Steyn N, Mashego T-A, Nel JH. Evaluation of body shape, eating disorders and weight management related parameters in black female students of rural and urban origins. SA J Psycol 2001, **31**: 45-53.

13. Collins JK. Methodology for the objective measurement of body image. Int J Eat Disord 1987; **6**: 393-399.

14. Schlundt GD, Bell C. 1993. Body Image Testing System: A microcomputer program for assessing body image. J Psychopathol Behav Assess, 1993; **15**: 267-285.

15. Han TS, Morrison CE, Lean MEJ. Age and health indications asessed by silhouette photographs. Eur J Clin Nutr 1999; **53**: 606-611.

16. Kruger HS, Lubbe MS. Perception of own body weight and weight control practices of female university students, with special reference to appetite supressants. J Dietet Home Econ 1996; **24**: 72-76.

17. Cuadrado C, Carbajal A, Moreiras O. Body perceptions and slimming attitudes reported by Spanish adolescents. Eur J Clin Nutr Suppl 2000; **54/1**: S65-S68.

18. Neumark-Sztainer D, Story M, Faibisch L, Ohlson J, Adamaik M. Issues of self-image among overweight African-American and Caucasian adolescent girls: A qualitative study. J Nutr Educ 1999; **31**: 311-320.

19. Kemper K, Sargent RG, Drane JW, Valois RF, Hussey JR. Black and white females' perceptions of ideal body size and social norms. Obes Res 1994; **2**: 117-126.

20. Massara EB, Stunkard AJ. A method of quantifying cultural ideals of beauty and the obese. Int J Obes 1979; **3**: 149-152

21. SAS/STAT® User's Guide, Volume 1, Cary NC: SAS Institute Inc., 1989, p 943.

22. Altman DG. Practical statistics for medical research, 8th ed. Chapman & Hall/CRC: London 1999, pp 399-400.

23. Mahan KL, Escott-Stump S. Krause's food, nutrition and diet therapy, 10th ed, WB Saunders Company: Philadelphia 2000, p 394.

24. Leedy PD, Ormond JE. Practical research. Planning and design, 7th ed., Merrill Prentice Hall: Upper Saddle River 1985, p 31.

25. Garner DM, Garfinkel PE. Body image in anorexia nervosa: Measurement, theory and clinical implications. Int J Psychol Med, 1982; **11**: 263-285.

26. Kruger HS, Van Aardt AM, Steyn HS. The development of an attitude scale for assessment of body image of black obese women. S Afr J Food Sci Nutr , 1996; **8**: 106-112.

Central University of Technology, Free State

APPENDIX B

Nutritional Health of Women (25-44yrs) in Mangaung, 2000
Anthropometry

Name: _____

Respondent number: ☐☐☐ 1-3

Measurer (interviewer): _____ ☐☐ 4-5

Weight (kg): _____ ☐☐☐.☐ 6-10

Height (m): _____ ☐.☐☐ 11-14

Circumferences (cm):

Upper-arm: _____ ☐☐☐.☐ 15-18

Waist: _____ ☐☐☐.☐ 19-23

Hip: _____ ☐☐☐.☐ 24-28

Bio-impedance:

Age (yrs): _____ ☐☐ 29-30

Elbow width (cm): _____ ☐.☐ 31-33

Bodystat count: _____ ☐☐☐ 34-36

Frame size ☐ 37

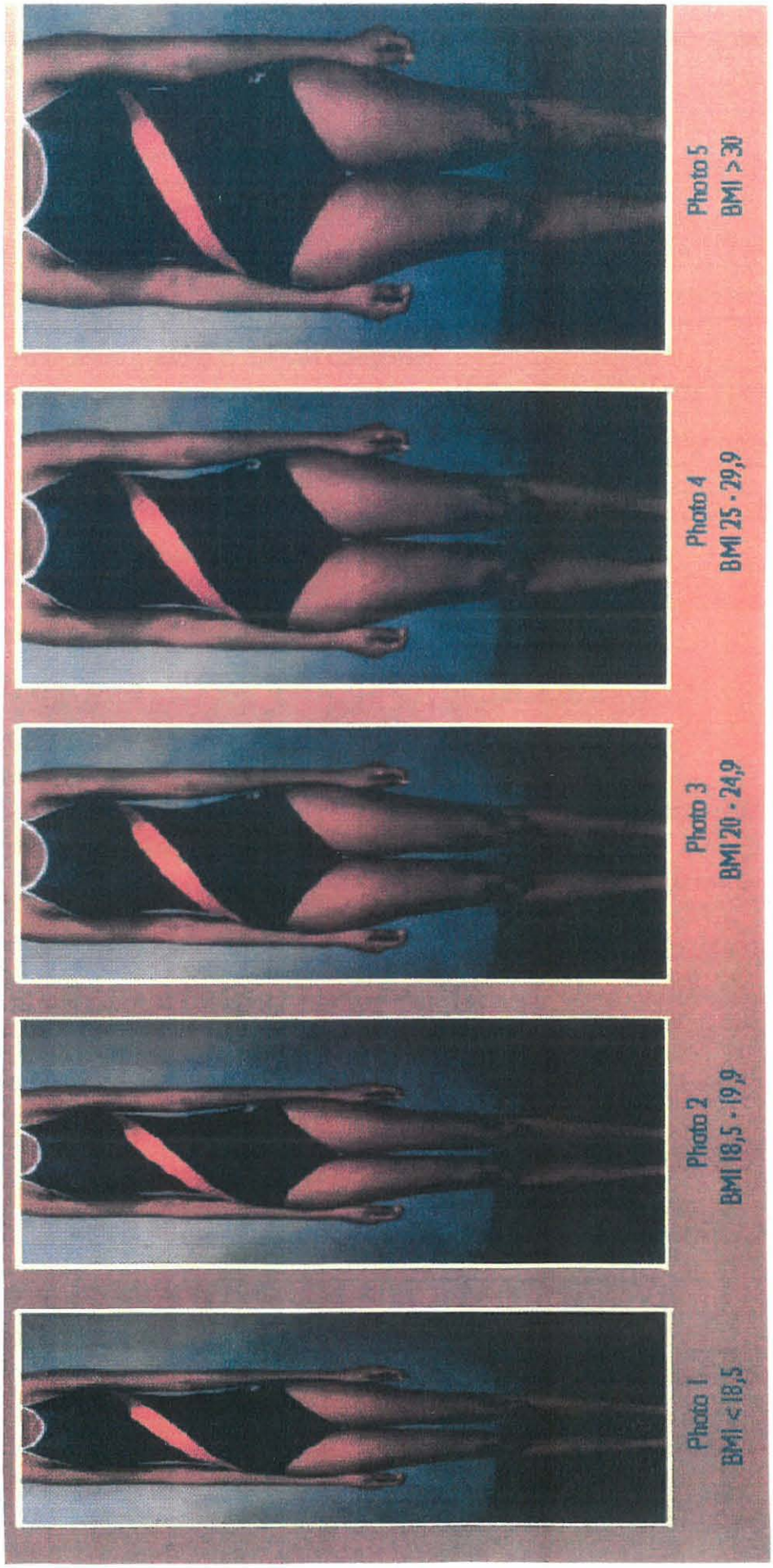
1. Small
2. Medium
3. Large

% Fat: _____ ☐☐.☐ 38-41

% Lean mass: _____ ☐☐.☐ 42-45

Central University of Technology, Free State

APPENDIX C[1]



APPENDIX C[2]

NUTRITIONAL HEALTH OF WOMEN (25-44 YRS) IN MANGAUNG, 2000
BODY IMAGE

NAME: _____
RESPONDENT NUMBER: _____
INTERVIEWER: _____

1. Which person looks the healthiest?	1 2 3 4 5	
2. Which person's body is the most attractive?	1 2 3 4 5	
3. Indicate which photo's belong to the next categories:		
a. Female fat (overweight)	1 2 3 4 5	
b. Female normal (acceptable)	1 2 3 4 5	
c. Female slim (underweight)	1 2 3 4 5	
4. What is the reaction of your community towards Somebody that looks like photo 5?	**1.Yes 2.No**	
a. Think they are rich.	Yes No	
b. Think they are healthy.	Yes No	
c. Think they are attractive.	Yes No	
d. Think they are the same as other people.	Yes No	
e. Think they are lazy and do not like them.	Yes No	
f. Avoid them socially.	Yes No	
g. Laugh at them.	Yes No	
5. What is the reaction of your community towards somebody who looks like photo 1.		
a. Think they are rich.	Yes No	1
b. Think they are healthy.	Yes No	1
c. Think they are attractive.	Yes No	2
d. Think they are the same as other people.	Yes No	2
e. Think they are lazy and do not like them.	Yes No	2
f. Avoid them socially.	Yes No	2
g. Laugh at them.	Yes No	2

Central University of Technology, Free State

APPENDIX D

NUTRITIONAL HEALTH OF WOMEN (25-44 YRS) IN MANGAUNG, 2000

ATTITUDE SCALE

NAME: _____

RESPONDENT NUMBER: _____ 1-3

INTERVIEWER: _____ 4-5

1. AGREE 2. DO NOT AGREE 3. UNCERTAIN

	1	2	3	
1. Fat people have more friends	☐	☐	☐	6
2. Children do not like fat mothers	☐	☐	☐	7
3. The clothes of fat people do not fit well	☐	☐	☐	8
4. Fat people cannot work hard	☐	☐	☐	9
5. Fat people are people who eat too much	☐	☐	☐	10
6. Thin women get jobs easier	☐	☐	☐	11
7. Foods for reducing diets are cheaper	☐	☐	☐	12
8. Thin people can wear more fashionable clothes	☐	☐	☐	13
9. Thin women are beautiful	☐	☐	☐	14
10. When one eats less to lose weight, one feels hungry all day	☐	☐	☐	15
11. Men prefer fat women	☐	☐	☐	16
12. Foods for reducing diets are tasty	☐	☐	☐	17
13. Fat people feel more unhappy	☐	☐	☐	18
14. People who eat healthy foods, are thin	☐	☐	☐	19
15. If one exercises daily, one feels healthy	☐	☐	☐	20
16. When one eats less to lose weight, one always wants to eat something tasty	☐	☐	☐	21
17. It is difficult to lose weight	☐	☐	☐	22
18. Fat women are well cared-for by their husbands	☐	☐	☐	23
19. If one loses weight, one feels proud	☐	☐	☐	24
20. I enjoy bodily exercise	☐	☐	☐	25
21. If one loses weight, one looks unattractive with loose skin	☐	☐	☐	26

APPENDIX E

WOMENS NUTRITIONAL HEALTH SURVEY: WOMEN 25-44 YEARS OLD

SOCIO-DEMOGRAPHIC QUESTIONNAIRE

(All information in this questionnaire is confidential).

Name:_____

Respondent number: ☐☐☐ 1-3 ☐☐ 4-5

Interviewer: _____

D D M M Y Y Y Y

Birth Date: ☐☐☐☐☐☐☐☐ 6-13

Interview Date: ☐☐☐☐☐☐☐☐ 14-21

Age (years) if Birth Date unknown:_____ ☐☐ 22-23

Address: _____

Tel No (H):_____ **(W):**_____

How many years have you been living in an urban area (like Mangaung)? ☐☐ 24-25

Encircle the appropriate answer:

Language: ☐ 26

1. Sotho
2. Tswana
3. English
4. Afrikaans
5. Other,

specify_____

Number of children: (born):_____ ☐☐ 27-28

Number of children: (alive):_____ ☐☐ 29-30

Do you smoke at all? ☐ 31

1. Yes
2. No

If yes, how many cigarettes per day? ☐☐ 32-33

Household composition:

How many persons live in the house permanently (5-7 days per week)?_____ ☐☐ 34-35

Number of children (< 18 yrs):_____ ☐☐ 36-37

Number of adults (≥ 18 yrs): _____ ☐☐ 38-39

40

1. Unmarried
2. Married
3. Divorced
4. Separated
5. Widowed
6. Living Together
7. Traditional Marriage
8. Other, specify_____

What is your highest level of education? 41

1. None
2. Primary School
3. Std 6-8
4. Std 9-10
5. Tertiary Education
6. Don't Know

Employment status of respondent 42

1. Housewife by choice
2. Unemployed
3. Self Employed
4. Full time wage earner (receive a salary)
5. Other, specify (part-time, peace job etc.)_____
6. Don't Know

Husband/ partner's employment status 43

1. Retired by choice
2. Unemployed
3. Self Employed
4. Full time wage earner (receive a salary)
5. Other, specify (part-time, peace job etc.)_____
6. Not Applicable e.g. dead

Who is the head of this household? 44

1. Self
2. Husband
3. Child/ren
4. Parent
5. Grandparent
6. Friend
7. Other, specify _____

Type of dwelling: ☐ 45

1. Brick, Concrete
2. Traditional mud
3. Tin
4. Plank, wood
5. Other, specify_____

Number of rooms in house (excluding bathroom, toilet and kitchen, if separate) ☐☐ 46-47

Where do you get drinking water most of the time? ☐ 48

1. Own tap
2. Communal tap
3. River, dam
4. Borehole, well
5. Other, specify _____

What type of toilet does this household have? ☐ 49

1. Flush
2. Pit
3. Bucket, pot
4. VIP
5. Other, specify _____

What fuel is used for cooking most of the time? ☐ 50

1. Electric
2. Gas
3. Paraffin
4. Wood, Coal
5. Sun
6. Open fire

Do you use a cast iron pot for cooking? ☐ 51

1. Never
2. ≤ Once a week
3. > Once a week
4. Every day

Does the home have a **working**:

Refrigerator and/or freezer ☐ 52

1. Yes
2. No

Stove (Gas, Coal or electric) or Hot Plate ☐ 53

1. Yes
2. No

Primus or Paraffin Stove ☐ 54
1. Yes
2. No

Microwave ☐ 55
1. Yes
2. No

Radio and/or Television ☐ 56
1. Yes
2. No

How many people contribute to the total income? _____ ☐☐ 57-58

Household income per month (including wages, rent, sales of vegs, etc. State grants). ☐ 59

1. None
2. R100-R500
3. R501- R1000
4. R1001-R3000
5. R3001-R5000
6. Over R5000
7. Don't know

Is this more or less the income that you had over the past six months? ☐ 60

1. Yes
2. No

If no, is it more or less? ☐ 61

1. More
2. Less

How much money is spent on food weekly? ☐☐ 62-63

1. R0-R50
2. R51-R100
3. R101-R150
4. R151-R200
5. R201-R250
6. R251-R300
7. R301-R350
8. R351-R400
9. Over R 400

APPENDIX F

THE COMMUNITY OF NAMIBIA

This letter serves to inform the community of a research project titled " The nutritional health of women (25-44 years) in Mangaung" that will be undertaken by the Technikon Free State, University of the Orange Free State and the National Research Foundation during 2000. The project is aimed at investigating the change from the traditional healthy diet to a more Western unhealthy diet. The influence of this change of diet on health will be determined.

A random selection of 500 households in Bochabela, Phahameng, Joe Slovo and Namibia will be made to be included in the study. The women living in these households will be contacted by the community health workers and they will be asked whether they are interested in participating in the study. If they agree they will be fetched from Mangaung and taken to the Technikon for one day. No one will be forced to participate in the study.

On the day that they participate in the study a free medical examination will be done, blood will be drawn (including a HIV test), and they will be asked a number of questions about general background, what they eat, how active they are, and attitude towards health. None of the questions are difficult and anyone will be able to answer these questions.

The information will help to determine nutritional problems in women and to develop solutions for these problems. The project will benefit the community since we will be able to determine what interventions are required to improve the health of women in South Africa. The project will not cause any harm to the participants in any way. By participating in the research survey you will help other women in the country. The individual information will be kept strictly confidential. Women that participate will be paid an amount of R40.00 for their time. Please feel free to contact the community health workers at any time if you have any questions about the project.

DR CORINNA WALSH
PROJECT COORDINATOR

APPENDIX G

Central University of Technology, Free State

CONSENT FORM

NUTRITIONAL HEALTH OF WOMEN (25-44 YEARS) IN MANGAUNG, 2000

Ethics committee reference number: 02/00

Declaration by or on behalf of the participant:

Respondent number ☐☐☐

I, the undersigned, ...

[ID.....]

.....(address)

A confirm that:

1. I have been asked to participate in the above-mentioned research survey carried out by the Technikon Free State and University of the Orange Free State

2. It has been explained to me that:

2.1 The purpose of the research survey is to collect information on usual food intake, activity level, attitude towards health, risk for developing illnesses related to eating habits and lifestyle of women in the ages 25 to 45 years in Mangaung. The information collected will be used to determine nutritional problems and to develop solutions for these problems.

2.2 In order to collect this information I have been told that I will be asked a number of questions regarding:

- general background information;
- the types and amounts of foods I eat and how often I eat these foods;
- how active I am every day;
- my attitude towards leanness and fatness;

2.3 I also understand that a medical doctor will perform a free medical examination and that blood samples will be drawn by a registered nurse. One of these blood samples will include a test for HIV-AIDS. I also agree to be weighed and measured. I will not eat or drink anything after 10:00 of the evening preceding the research day. I will bring a list of the medication that I usually use with me on the research day.

2.4 I have been told that this informatio I from over 500 women in Mangaung and I will only be asked these questions once. The measurements and blood samples will also be taken once only.

2.5 I have been told that it will not take more than one day to collect the information.

3 I have been told that the measurements will not cause any harm to me in any way.

4 It was also explained to me that by participating in the research survey I will help other women in the country.

5 It was also explained to me that the information will be kept confidential but that it will be used anonymously for making known the findings to other scientists.

6. I understand that I will have no direct access to the results of the survey but I can contact the researcher who will inform me of the findings.

7. It was also clearly explained to me that I can refuse to participate in this research survey. If I refuse, it will not be not be held against me in any way.

8. The information in this consent form was explained to me by .....(name of interviewer) in .....(language) and I confirm that I have a good command in this language and understood the explanations. I was also given the opportunity to ask questions on things I did not understand clearly.

9. No pressure was applied on me to take part in this research survey.

10. Finally, after completion of my participation in this research survey I will receive a payment of R40. I will be responsible for my own transport home.

I hereby agree voluntarily to take part in this research survey.

Signed/confirmed at ..... on 2000

.....	.....
Signature or hand mark of Participant	Signature or hand mark of Witness