

PREVALENCE OF OVERWEIGHT AND OBESITY AND BODY IMAGE  
PERCEPTION AMONGST BLACK SOUTH AFRICAN FEMALE NURSES  
PRACTICING IN DURBAN, KWAZULU-NATAL, SOUTH AFRICA

By

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## ABSTRACT

**Background:** In South Africa, there is a high prevalence of overweight and obesity mostly amongst black women, placing them at increased risk for non-communicable diseases, (NCDs) which is the leading group cause of mortality. Powerful and unique influences predisposing to overweight and obesity amongst black South Africans include body image perception and cultural beliefs. Traditionally, being overweight is associated with being healthy, happy, strong and wealthy with the ability to bear children, while an underweight woman is considered to be unhappy, weak, poor and infected with the human immunodeficiency virus (HIV) or acquired immune deficiency syndrome (AIDS). As media and its messages promoting thinness became more available in the country, there has been a shift towards black South Africans desiring thinner bodies than what is preferred traditionally.

**Objectives:** To determine the prevalence of overweight and obesity. To determine body fat percentage and fat-free mass (FFM) as well as body image perception. To determine how they perceived their body image. To determine whether body image perception was influenced by cultural beliefs and whether factors such as media and family beliefs were overpowering cultural beliefs and influencing them to lose weight. To determine which factors were barriers to their body weight control.

**Design:** A descriptive, cross-sectional study involving 152 black female nurses from Netcare St Augustine's Hospital, Durban, South Africa.

**Methods:** Overweight and obesity was determined by body mass index (BMI) while body fat percentage and fat-free mass (FFM) were determined by bioelectrical impedance. A self-administered questionnaire, using the Stunkard figure rating scale was used to determine body image perception and the beliefs and factors influencing this.

**Results:** Mean age was 34 years (SD  $\pm$  8.4) and mean nursing years of experience was 6 years (SD  $\pm$  5.6). Half grew up in rural areas (56.0%) and most were of Zulu culture (82.0%). Very few (8.7%) reported being diagnosed with or having NCDs, while 21.3% were taking medications or had conditions that could cause weight gain. The

prevalence of overweight and obesity was 88.7% with 11.3% being normal weight, 34.4% overweight, 23.8% obese class I, 16.6% obese class II and 13.9% obese class III. The mean BMI was 32.1 kg/m<sup>2</sup> (SD ± 7.0) (obese class I) and the mean body fat percentage was 43.8% (SD ± 7.2). Many (69.6%) underestimated their body size by at least one body shape (41.1%), believing that they were thinner than they were. Their perceived mean BMI was 28.2 kg/m<sup>2</sup> (SD ± 5.6) which was overweight. Half (53.6%) wanted to reduce weight mostly by one (29.9%) or two shapes (44.8%).

Weakness (84.9%), HIV/AIDS (84.2%) and poverty (77.6%) were associated with underweight (BMI 18.3 kg/m<sup>2</sup>), while wealth (75.0%) was associated with obesity (BMI 34.3-45.4 kg/m<sup>2</sup>). Culturally, being overweight (BMI 26.2-29.9 kg/m<sup>2</sup>) (65.8%) was more desirable, however, health (90.1%) was associated with normal weight (BMI 19.3-23.1 kg/m<sup>2</sup>).

Amongst media, television was the most influential with respect to body image although older nurses were more influenced by radio ( $r=0.262$ ,  $p=0.001$ ) and newspapers ( $r=0.176$ ,  $p=0.033$ ) while younger nurses were more influenced by Facebook ( $r= -0.198$ ,  $p=0.024$ ) and Instagram ( $r= -0.205$ ,  $p=0.030$ ) to lose weight. Half agreed that media (57.4%) and family (51.4%) had a bigger influence on their body image than culture, indicating a shift in attitude. Over half (59.3%) had tried to reduce weight by mostly exercising (74.2%) and cutting out junk food (66.3%). The main factors that made it difficult for nurses to control their weight included working different shifts or long hours ( $M= 3.74$ ,  $SD \pm 1.0$ ), being too tired to exercise ( $M=3.66$ ,  $SD \pm 1.2$ ) or prepare balanced meals ( $M=3.41$ ,  $SD \pm 1.3$ ), which resulted in fast food being an easier option ( $M=3.37$ ,  $SD \pm 1.3$ ).

**Conclusion:** Black female nurses had a high prevalence of overweight and obesity placing them at increased risk for developing NCDs. Being educated health professionals did not encourage them to adopt healthy eating and lifestyle behaviours. Additionally, they underestimated their body image perception, masking their ability to self-diagnose overweight and obesity and were still influenced by cultural beliefs. It appears that media and family beliefs have caused a shift in attitude regarding large body sizes as many nurses wanted to reduce weight, although not enough to attain a

normal body weight. This shift in attitude could help reduce the prevalence of overweight and obesity amongst black SA females since they could be influenced to adopt healthy eating and lifestyle behaviours.

**Keywords:** obesity, body image perception, body fat, cultural beliefs, nurses in South Africa, black, female, media

## PREFACE

This dissertation was written between February 2017 and December 2017 under the supervision of Dr Chara Biggs using data collected from Black female nurses practicing at Netcare St Augustine's Hospital, Durban, KwaZulu-Natal, South Africa between July 2017 – August 2017.

Signed: .....

Date: .....

Yovenita Ramgolam (candidate)

As the supervisor of the candidate, I agree to the submission of this dissertation.

Signed:  .....

Date: .....13 April 2018.

Dr Chara Biggs (Supervisor)

## DECLARATION OF ORIGINAL WORK

I, Yovenita Ramgolam, declare that:

1. The entirety of the work contained in this dissertation is my own original work, except where otherwise stated.
2. This dissertation, or any part of it, has not been submitted for any degree or examination at any other university.
3. Where other sources have been used, they have not been copied and have been properly acknowledged.

Signed: .....

Date: .....

Yovenita Ramgolam (candidate)

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## LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
BIA	Bioelectrical Impedance Analysis
BIA-O	Body Image Assessment for Obesity
BID	Body Image Dissatisfaction/ Body Image Disturbance
BIRF	Body Image Rating Figures
BMI	Body Mass Index
BREC	Biomedical Research Ethics Committee
BSS	Body Size Scale
CHW	Community Health Worker
DOH	Department of Health
FFM	Fat Free Mass
FRS	Figure Rating Scale
HCW	Healthcare Worker
HIV	Human Immunodeficiency Virus
ISAK	International Society for the Advancement of Kinanthropometry
KZN	KwaZulu-Natal
NCDs	Non-Communicable Diseases
NHS	National Health Service
OECD	Organization for Economic Co-operation and Development
PCOS	Polycystic Ovarian Syndrome
RMR	Resting Metabolic Rate

SA	South Africa/South African
SADHS	South African Demographic and Health Survey
SANHANES	South African National Health and Nutrition Examination Survey
SD	Standard Deviation
SPSS	Statistical Package for the Social Sciences
TB	Tuberculosis
TV	Television
UK	United Kingdom
UKZN	University of KwaZulu-Natal
UNICEF	United Nations Children's Fund
USA	United States of America
WHO	World Health Organization

## **CHAPTER 1: INTRODUCTION, THE PROBLEM AND ITS SETTING**

### **1.1 IMPORTANCE OF THE STUDY**

South Africa (SA) has the highest prevalence of obesity in sub-Saharan Africa (Micklesfield, Lambert, Hume, Chantler, Pienaar, Dickie, Puoane & Goedecke 2013). Within 3 years, the prevalence of overweight and obesity amongst females in SA has risen from 65.1% in 2013 (Shisana, Labadarios, Rehle, Simbayi, Zuma, Dhansay, Reddy, Parker, Hoosain, Naidoo, Hongoro, Mchiza, Steyn, Dwane, Makoe, Maluleke, Ramlagan, Zungu, Evans, Jacobs, Faber & SANHANES-1 team 2013), to 70.0% in 2016 (South African Department of Health 2017). According to Shisana *et al* (2013), the highest prevalence of obesity was observed in black African women. The consequences of obesity are severe, particularly as obesity is a modifiable risk factor for non-communicable diseases (NCDs) (WHO 2000), which account for 37.0% of all causes of mortality in SA and is a major health burden (Shisana *et al* 2013). It is therefore essential to treat overweight and obesity to decrease the rate of mortality caused by NCDs (Kontis, Mathers, Rehm, Stevens, Shield, Bonita, Riley, Poznyak, Beaglehole & Ezzati 2014). Although the causes of obesity are multifactorial, body image perception and cultural beliefs have a unique influence on the prevalence of obesity amongst black women in SA (Skaal & Pengpid 2011).

Black women in SA embrace a larger body size, accept being overweight with ease and consider being overweight attractive (Kruger, Puoane, Senekal & Van Der Merwe 2005), as typically, in the South African black culture, men prefer women with heavier body weights (Chithambo & Huey 2013). Traditionally, it is believed that being heavier represents a healthy woman who is strong and wealthy (Puoane, Fourie, Shapiro, Rosling, Tshaka & Oelefse 2005b; Steyn, Senekal, Brits, Alberts, Mashego & Nel 2000). Thin and underweight women are considered unhappy and infected with HIV/AIDS (Hurley, Coutsooudis, Giddy, Knight, Loots & Esterhuizen 2011; Matoti-Mvalo & Puoane 2011; Mvo, Dick & Steyn 1999). Young black women believe that being overweight represents fertility and the ability to bear children (Salamon & Juhasz 2011). Those who have strong cultural beliefs pose a greater risk for obesity due to their unwillingness

to choose facts over culture and understanding these cultural beliefs and the extent of their influence on body image perception is essential to develop strategies to prevent and treat overweight and obesity in black women in SA (Hendley, Zhao, Coverson, Din-Dzietham, Morris, Quyyumi, Gibbons & Vaccarino 2011). Puoane *et al* (2005b) stated that although black SA women respected a moderately overweight woman, they would like to lose weight and this shift in attitude could be due to the media. According to Mvo *et al* (1999), black overweight and obese women reported being content with the way they look when their significant partner complimented their body size. This indicates that the opinion of family can be influential on black SA women and therefore, it is essential to investigate the influence of family beliefs as well as factors which could influence cultural beliefs such as education and the media need to be investigated.

If education is effective in counteracting the influence of culture, then individuals in health care professions who maintain people's health through evidence-based medicine and advices regarding optimal health, should adopt healthy behaviours and be effective role models themselves. Since nurses make up a large proportion of South Africa's Health Care System (DOH 2013), this study was conducted on them and a lower prevalence of overweight and obesity would therefore be expected amongst this population (Pistikou, Zyga, Sachlas, Katsa, Daratsianou & Gil 2014). In general, the risk of obesity amongst nursing staff is similar to that of the general population and they have a higher prevalence of obesity than other healthcare professionals (Kyle, Neall & Atherton 2016). Since in SA, the high prevalence of overweight and obesity has been linked to cultural beliefs amongst black women, an understanding about these and perceptions regarding body image, as well as risk factors that are barriers to body weight control may help develop culturally targeted interventions in SA to address the obesity epidemic (Baleta & Mitchell 2016).

This research was important as there are very few studies investigating the influence of education and media on cultural beliefs and body image perception amongst black SA nurses. It was important to determine the impact of culture, media and family beliefs on body image perception as well as risk factors that are barriers to body weight control

amongst nurses, in order to be able to develop culturally sensitive strategies to prevent and treat the obesity epidemic in SA.

## 1.2 STATEMENT OF THE PROBLEM

The purpose of this descriptive cross-sectional study conducted on black SA female nurses practicing in a private hospital in Durban, KwaZulu-Natal (KZN), SA was to investigate the prevalence of overweight and obesity, body fat percentage, FFM as well as body image perception and the influence of culture, media and family on those perceptions. Factors that are barriers to weight control amongst them were also investigated.

## 1.3 RESEARCH OBJECTIVES

The following objectives were investigated amongst black female nurses practising in a private hospital in Durban, KZN, SA.

- 1.3.1 To determine the prevalence of overweight and obesity.
- 1.3.2 To determine their body fat percentage and FFM.
- 1.3.3 To determine how they perceived their body image.
- 1.3.4 To determine whether they were satisfied with their body shape.
- 1.3.5 To determine whether their cultural beliefs influenced their body image perception.
- 1.3.6 To determine whether they were influenced by media to lose weight and whether the influence of media overpowered their cultural beliefs.
- 1.3.7 To determine whether family beliefs influenced the way they felt about their body image.
- 1.3.8 To determine which factors were barriers to their body weight control.

## 1.4 HYPOTHESES

Black female nurses practising in a private hospital in Durban KZN, SA would:

- 1.4.1 Have a low prevalence of overweight and obesity.
- 1.4.2 Have a low body fat percentage and normal FFM.
- 1.4.3 Perceive themselves to be smaller than what they actually were.
- 1.4.4 Be satisfied with their body shape.
- 1.4.5 Be strongly influenced by cultural beliefs to be overweight or obese.
- 1.4.6 Be influenced by media to lose weight.
- 1.4.7 Think that media is overpowering culture.
- 1.4.8 Be influenced by family beliefs to lose weight.

## 1.5 STUDY PARAMETERS

The parameters included female nurses who were SA citizens of black ethnicity practicing in Durban, KZN at Netcare St. Augustine's hospital during July – August 2017.

## 1.6 ASSUMPTIONS

It was assumed that:

- 1.6.1 The study population would be honest when answering the questionnaire.
- 1.6.2 The study population would not be influenced by the responses of other nurses who were participating.
- 1.6.3 The study population would return the questionnaire.

## 1.7 DEFINITIONS OF TERMS

**Affluence** – having a copious amount of material goods, i.e. wealth (Bate 2009).

**Attitude** – a person's attitude refers to their personal appraisal of an entity and influence the person's responses to this entity (Ajzen & Fishbein 1977).

**Attractiveness** – a quality pleasing to the senses that creates a desire in a person or object (Talamas, Mavor & Perrett 2016).



**Beliefs** – incessant, unopposed representations of the world that include key principles about events, causes, and objects which people use and accept as reality (Connors & Halligan 2015).

**Body image** – an all-surrounding concept regarding self-perception and attitudes related to their physical appearance (Cash, Morrow, Hrabosky & Perry 2004).

**Body image dissatisfaction**– a personal unhappiness with some features regarding one's appearance (Gardner & Brown 2010).

**Body mass index** – a person's weight in kilograms (kg) divided by height in metres squared ( $m^2$ ) (World Health Organization 2017).

**Community health worker** – a trusted member of the community who enters the homes in the community to assist people to improve their health status. This is an extension of the Primary Health Care which reaches out to people at household level (KZN DOH 2001).

**Compartment model** – a method for body composition measurement which involves independent assessment of body density, body water and bone (Fields & Goran 2000). While a two-compartment body composition model requires one measurement besides body weight, a four-compartment model is based upon three or more measurements (Heymsfield & Lichtman 1990).

**Culture** - consists of a system of common behaviours and learnt patterns of thought that are communicated within groups, communities or populations through forms of social learning tools. These behaviours consist of practical information about life as well as values, attitudes and beliefs (Figueroa, Saltzman, Jarick, Metcalfe & Wiley 2017).

**Desirable** – the tendency to see something or someone in a favourable light and is worth seeking (Dodaj 2012).

**Ethnicity** – is a set of individual points of reference that involve differences between people. These people belong to different social groups based on common cultural traditions (Hale 2004).

**Fast food** – an easily prepared processed meal which is served at snack bars or restaurants as a quick meal or to be taken away (New Oxford American Dictionary 2017).

**Health care professional** – personnel who maintain the health of individuals and communities through evidence-based medicine and caring, advising or providing preventative and curative measures and promote optimal health (World Health Organization 2010).

**Health care worker** – an individual whose job entails protecting and improving the health of their communities (World Health Organization 2006).

**Health education** – any experience relating to knowledge that is considered to help communities and individuals improve their health. This can be done by increasing their knowledge or influencing their attitudes (World Health Organization 2013).

**Higher education** – education beyond the secondary level, that is provided by a college or university (EP-Nuffic 2015).

**Junk food** – foods that contribute substantial amount of calories but little nutritional value (WebMD 2017b).

**Non-communicable diseases** – chronic diseases which are not spread from one person to another. The four main types include cardiovascular diseases, cancers, chronic respiratory diseases and diabetes (World Health Organization 2017).

**Nurse** - one whose job entails the treatment and care of, and the administration of medicine to a patient, as well as monitoring of the patient's vital signs and their reaction to disease conditions, trauma, stress, anxiety, medication and treatment (South African Nursing Council 2016).

**Obesity** – for adults, a body mass index (BMI) of 30.0 kg/m<sup>2</sup> or higher is used to identify individuals with obesity (World Health Organization 2017).

**Overweight** – for adults, a body mass index greater than or equal to 25.0 kg/m<sup>2</sup> – 29.9 kg/m<sup>2</sup> (World Health Organization 2017).

**Perception** – a complex thought process that portrays a unique picture of the world which may contrast with reality (Shisana *et al* 2013).

**Peri-urban** – an area between consolidated urban and rural regions (UNICEF 2012).

**Prevalence** –the total number of individuals in a population who have a disease or health condition at a specific period that is expressed as a percentage (Harvard TH Chan School of Public Health 2017).

**Prosperity** – combination of the measurement of economic wealth and well-being (Bate 2009).

**Private hospital** – is one which provides specialised healthcare services which cannot be acquired from public hospitals (Basu, Andrews, Kishore, Panjabi & Stuckler 2012).

**Rural** – is a large and isolated area with a low population density (UNICEF 2012).

**Secondary education** – in SA, secondary education comprises of two phases: the senior phase (grades 7 up to and including 9); and the further education and training phase (grades 10 up to and including 12) (EP-Nuffic 2015).

**Severe obesity** – for adults, a body mass index greater than 35.0 kg/m<sup>2</sup> (South African Demographic and Health Survey 2016).

**Suburban** – an area of residence situated on the outskirts of a city or town (UNICEF 2012).

**Tetrapolar impedance** – is a valid and reliable field method for assessing body composition at different frequencies, in the supine position by placing four electrodes in the middle of the dorsal surfaces of the hands and feet, proximal to the metacarpal-phalangeal and metatarsal-phalangeal joints (Lukaski, Bolonchuk, Hall & Siders 1986).

**Urban** – an area within the power of a municipality, which has a threshold population, population density and economic function or an area with certain characteristics such as paved streets, electric lighting and sewerage (UNICEF 2012).

**Wealth** – an abundance of material goods and money (Tan 1994).

## 1.8 SUMMARY

It is evident that the prevalence of overweight and obesity is increasing in SA especially amongst women. Black SA women, including those in the health profession such as nurses who make up a large proportion of South Africa's Health Care System, are especially at risk due to cultural beliefs and body image perception. Factors that may influence cultural beliefs and the association of overweight and obese body shapes with wealth, beauty, health, ability to bear children and thin body shapes with sickness and poverty should be investigated. Therefore, it was essential that the attitude and beliefs influencing body image perception in addition to the influence of media, education and family beliefs amongst black female nurses be investigated. Moreover, it is important to investigate and understand factors that are barriers to body weight control amongst them. Since there is a scarcity of published studies that have been conducted on black SA nurses investigating prevalence of overweight and obesity, body image perception, cultural beliefs, the influence of media, education and family beliefs regarding body image and factors that prevent nurses from being able to control their weight, this study would contribute important knowledge to SA literature regarding black female nurses.

## 1.9 DISSERTATION OUTLINE

This dissertation is laid out as follows:

Chapter 1: Introduction, the problem and its setting

Chapter 2: Review of related literature

Chapter 3: Methodology

Chapter 4: Results

Chapter 5: Discussion

Chapter 6: Conclusion and recommendations

## 1.10 REFERENCING STYLE

The referencing style used in this dissertation is in accordance with the referencing guidelines used in the Department of Dietetics and Human Nutrition at the University of KwaZulu-Natal, Pietermaritzburg, South Africa.

## CHAPTER 2: REVIEW OF RELATED LITERATURE

### 2.1 INTRODUCTION

Overweight and obesity are a growing epidemic around the world, mostly amongst women (Organization for Economic Co-operation and Development 2012). In 2016, more than 1.9 billion adults were overweight of which 650 million were obese (WHO 2018). In SA, the prevalence of overweight and obesity amongst women is 25.0% and 40.1%, respectively with the prevalence of obesity being highest amongst black women (58.5%) (Shisana *et al* 2013). Obesity predisposes to NCDs (Puoane, Bradley & Hugles 2005a). The epidemic of NCDs in SA presents a leading threat to health and development (Shisana *et al* 2013). This obesity epidemic therefore needs to be addressed to decrease the prevalence of NCDs (Kontis *et al* 2014).

The high prevalence of obesity amongst black SA women is a consequence of a multitude of factors, including socio-cultural and behavioural attitudes towards fatness and body image perception (Micklesfield *et al* 2013; Skaal & Pengpid 2011). Being overweight is desirable to most black SA women because this signifies health and happiness, in contrast to thinness which represents personal problems and infections such as HIV/AIDS (Kruger *et al* 2005; Puoane *et al* 2005b; Mvo *et al* 1999). Despite black SA women in general favouring an overweight figure, some desire to lose weight which, could be the influence of media causing a shift in attitudes (Puoane *et al* 2005b). An understanding of these cultural beliefs, and whether they are changing because of media exposure is essential to be able to combat the obesity epidemic (Puoane *et al* 2005b). In addition to cultural beliefs and the influence of media, it is essential to investigate whether conventional health education, that health professionals are exposed to as part of their training, is effective in encouraging them to adopt healthy eating and lifestyle behaviours, as they are considered to be important role models in the community (Rush, Kee & Rice 2005) and could therefore play an important role in the strategies to overcome obesity in SA.

This literature review discusses the prevalence of overweight and obesity in general and then amongst educated healthcare workers such as nurses. Factors such as body image perception, culture and media influencing overweight and obesity in black SA women and tools used to assess body image perception are also reviewed.

## 2.2 PREVALENCE OF OVERWEIGHT AND OBESITY AND, NON-COMMUNICABLE DISEASES

### 2.2.1 Worldwide

The prevalence of obesity worldwide has nearly tripled between 1975 and 2016 (WHO 2017). In 2016, 39.0% of the world's adult population were overweight, of which 39.0% were men and 40.0% were women. The prevalence of obesity was 13.0% of which 11.0% were men and 15.0% were women (WHO 2017). Obesity predisposes to NCDs such as cardiovascular diseases, respiratory diseases, diabetes and cancer (Puoane *et al* 2005a). According to the WHO (2017), 40 million people die each year due to NCDs, a figure that is equivalent to 70.0% of deaths globally. Most annual deaths from NCDs are attributed to cardiovascular diseases (44.3%, 17.7 million), followed by cancer (22.0%, 8.8 million), respiratory diseases (9.8%, 3.9 million) and diabetes mellitus (4.0%, 1.6 million). Reducing the prevalence of obesity may consequently diminish the prevalence of NCDs (Kontis *et al* 2014).

### 2.2.2 South Africa

Following the global trend, there has been a progressive increase in the prevalence of overweight and obesity in SA (Van Der Merwe & Pepper 2006), as shown in Table 2.1. According to Shisana *et al* (2013), obesity is a risk factor for NCDs which accounts for 37.0% of all causes of mortality in SA and is therefore a major public health concern (Kruger *et al* 2005). By 2010, 44.0% of NCD deaths in SA were due to cardiovascular disease, 18.0% due to cancers, 9.3% due to chronic respiratory diseases and 8.0% due

to diabetes mellitus (Nojilana, Bradshaw, Pillay-van Wyk, Msemburi, Laubscher, Somdyala, Joubert, Groenewald & Dorrington 2016). It is therefore imperative to address the obesity epidemic in SA to decrease the prevalence of NCDs and hence the mortality rates (Kontis *et al* 2014).

Table 2.1: Comparison between the prevalence of overweight and obesity in South Africa by gender (Global Health Observatory 2016; Shisana *et al* 2013).

Gender	SANHANES-1	Global Health Observatory	
	2013	2014	2016
<b>Overweight (%)</b>			
Male	19.6	38.8	40.5
Female	25.0	64.3	65.4
<b>Obesity (%)</b>			
Male	11.6	14.2	15.4
Female	40.1	38.5	39.6
<b>MEAN BMI<sup>1</sup> (kg/m<sup>2</sup>)</b>			
		<b>2010</b>	<b>2016</b>
Male	23.2	24.7	25.0
Female	29.0	28.9	29.3

<sup>1</sup> BMI = Body Mass Index



The prevalence of overweight and obesity amongst SA black women is particularly high. The results from a cross-sectional analytical study carried out on 304 women (303 black and one coloured) in Bloemfontein by Prinsloo, Joubert, Mohale, Nyindi, Matu, Ntechane & Struwig (2011), found that 32.2% of women were overweight, 44.1% were obese women and the mean BMI was 30.1 kg/m<sup>2</sup>, which is obese class I. They were both from formal and informal settlements and 195 were unemployed, while 64 were employed and the rest were students. Twenty were uneducated while 261 had primary school, secondary school and higher education. In an exploratory study conducted by Matoti-Mvalo & Puoane (2011) in an urban township in Cape Town on 513 black women, 40.3% were overweight while 42.3% were obese. A health survey conducted by Malaza, Mossong, Bärnighausen & Newell (2012) in a rural area in KZN SA with a high HIV prevalence in 2010 on 14,198 black adults found that 58.7% of women were overweight and 31.3% were obese. A cross-sectional exploratory study carried out on 328 black women in Durban by Devanathan, Esterhuizen & Govender (2013) demonstrated a mean BMI of 37.0 kg/m<sup>2</sup> which is obese class II, with 16.0% overweight and 76.0% obese participants. In the SANHANES-1 study, the prevalence of overweight was 24.9% and obesity was 39.9% amongst black women with a mean BMI of 29.0 kg/m<sup>2</sup>, which is overweight (Shisana *et al* 2013). In the National Department of Health SADHS (2016) report, the prevalence of overweight and obesity was 26.5% and 40.9% respectively, amongst black women with a mean BMI of 29.2 kg/m<sup>2</sup>, which is overweight. These studies have demonstrated a high prevalence of overweight and obesity amongst black women across SA (Table 2.2).

Table 2.2: Comparison of the prevalence of overweight and obesity amongst black women in South Africa.

<b>Studies</b>	<b>Prevalence (%)</b>		
	<b>Overweight</b>	<b>Obesity</b>	<b>Total</b>
Prinsloo <i>et al</i> (2011)	32.2	44.1	76.3
Matoti-Mvalo & Puoane (2011)	40.3	42.3	82.6
Malaza <i>et al</i> (2012)	58.7	31.3	90.0
Devanathan <i>et al</i> (2013)	16.0	76.0	92.0
Shisana <i>et al</i> (2013)	24.9	39.9	64.8
SADHS (2016)	26.5	40.9	67.4

The prevalence of overweight and obesity in black SA women appears to be rising at an alarming rate, and it is therefore essential to identify the causes of this situation. Identifying the factors influencing overweight and obesity amongst black SA women will enable the implementation of strategies to combat this epidemic.

### 2.3 FACTORS INFLUENCING OVERWEIGHT AND OBESITY

Although obesity is the result of an excess energy intake in comparison to requirements, the etiology of obesity is highly complicated involving genetic, physiologic, environmental, psychological, socio-cultural, economic and even political factors that interact in a variety of ways (Wright & Aronne 2012). To correspond with the objectives of this study, this literature review focusses on body image perception amongst educated health professionals (nurses), cultural beliefs and the possible influence of media on body image.

## 2.3.1 Body image

### 2.3.1.1 *Definition*

Body image is defined as the multidimensional concept people have about their bodies including body size self-perception, attitudes and dissatisfaction regarding body size and body size concerns (Cash *et al* 2004). These beliefs determine a person's preference for thinness or fatness (Shisana *et al* 2013).

### 2.3.1.2 *Determination of body image*

Body image is measured by using body shape drawings (pictograms) or figure rating scales (FRS) which are usually eight to nine drawings showing increasing adiposity along the scale. Several studies have taken place in Africa, addressing body image perception, using different FRS.<sup>2</sup>

### 2.3.1.3 *Body image perception*

Several studies investigating body image perception on black SA women have been conducted and some are as follows. In the study conducted in Bloemfontein by Prinsloo *et al* (2011), 28.6% (86/301) of the black women perceived themselves as obese, of whom 72.1% (62/86) were actually obese. This indicated that some could properly identify their body image. Out of 215 who did not perceive themselves as obese, 33.0% (71/215) were actually obese. Therefore, more than half of the obese women (53.4%) underestimated their body image and were not able to perceive themselves as being obese, despite the fact that 84.0% (236/281) had secondary and higher education (Prinsloo *et al* 2011).

In the study in Cape Town, 40.3% (207/513) of the black women were overweight, of which only 33.5% (172/513) perceived themselves as overweight while 42.3% (217/513) were obese, of which only 8.0% (41/513) perceived themselves as obese (Matoti-Mvalo & Puoane 2011). Although more than half (52.1%) had high school education they still underestimated their body image (Matoti-Mvalo & Puoane 2011).

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<sup>2</sup> An in-depth discussion of these scales, and which was the most appropriate for this study, follows at the end of the literature review.

In the study in Durban, when comparing the actual body image as determined by BMI with the perceived body image of black women, it was observed that the participants tended to underestimate their body image across all weight categories (Devanathan *et al* 2013). Over half (52.0%, 171/328) perceived themselves as overweight when only 16.0% (51/328) were truly overweight. Only 27.0% (89/328) perceived themselves as obese when 76.0% (250/328) were actually obese. The literacy level of participants was not recorded in this study (Devanathan *et al* 2013).

Misconceptions regarding perceived weight status should be addressed (Prinsloo *et al* 2011) because it is very common for black women to underestimate their body image. This is a very important factor that is contributing to the high prevalence of overweight and obesity in this ethnic group since they are comfortable with being overweight (Kruger *et al* 2005). It is therefore essential to investigate their perceptions regarding their own body weight within the culture.

#### 2.3.1.4 *Preferred body image amongst black South African women*

Generally, in SA, black women have shown a preference for a larger (overweight) body size as compared to their white counterparts (Mchiza, Goedecke & Lambert 2011; Mchiza, Goedecke, Steyn, Charlton, Puoane, Meltzer, Levitt & Lambert 2005; Puoane *et al* 2005a; Puoane, Steyn, Bradshaw, Laubscher, Fourie, Lambert & Mbananga 2002). In the descriptive cross-sectional study “Big is Beautiful”, conducted in a township in Cape Town, the beliefs and attitudes about body size was investigated using the Stunkard FRS<sup>3</sup> in 44 black, female community health workers (CHW). A moderately overweight woman (BMI=27.0 kg/m<sup>2</sup>) was the most preferred size (Puoane *et al* 2005b). In a follow up cross-sectional exploratory study carried out in the same township five years later, 513 black women aged 18 to 65 years were asked to choose their preferred figure from the Stunkard FRS (Matoti-Mvalo & Puoane 2011). Fifty percent preferred to be normal weight while approximately a third (33.5%) preferred to be overweight and 7.8% preferred to be obese (Matoti-Mvalo & Puoane 2011).

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<sup>3</sup> The figure rating scale consists of nine silhouettes with a BMI assigned to each, ranging from underweight (BMI: <18.5 kg/m<sup>2</sup>) to obese class III (BMI: >40.0 kg/m<sup>2</sup>).

South African studies have shown that black women display less body size dissatisfaction when compared to other ethnic groups (Micklesfield *et al* 2013; Mchiza *et al* 2011; Mchiza *et al* 2005). This is because the western culture promotes thinness, denigrates excess weight and stigmatizes obese people (Schwartz & Brownell 2003). This preference for a higher body weight is the result of culture-bound beliefs which encourage fuller bodies and promote lifestyle behaviours commonly associated with obesity (Micklesfield *et al* 2013; Shisana *et al* 2013). Although aware of the negative consequences of being overweight, many overweight and obese black SA women did not want to lose weight (Kruger *et al* 2005) as body image is associated with valued attributes such as strength, respect, beauty, wealth, health but also sickness.

### *Strength*

In the study “Big is Beautiful”, an overweight woman was regarded as someone who is round and who should be able to do any work required of her, such as being able to cook a big pot of food without getting easily blown away by the wind (Puoane *et al* 2005b).

### *Respect and beauty*

A body image with a BMI of 27.0 kg/m<sup>2</sup> was associated with dignity, respect, confidence and beauty (Puoane *et al* 2005b). According to Okop, Mukumbang, Mathole, Levitt & Puoane (2016), who conducted a descriptive qualitative survey on 78 black men and women near the Cape Town metropolis, weight gain was desirable as an overweight woman was more attractive to men. In a secondary analysis conducted by Mchiza *et al* (2011) on 204 mothers and 372 pre-adolescent girls in Cape Town, black mothers and daughters associated a bigger body size with beauty. Qualitative in-depth interviews conducted in a metropolitan area in Cape Town on 10 uneducated, overweight black women found that their significant partners complimented their body size. This made them happy and therefore content with their body shape (Mvo *et al* 1999). As being overweight is considered beautiful and attractive, black SA women viewed themselves as being of a normal weight and healthy, when they were actually overweight and obese (Mchiza *et al* 2011; Skaal & Pengpid 2011; Puoane *et al* 2005b).

### *Wealth*

In many sectors of the African population, obesity is perceived to reflect affluence. Being an overweight or obese woman shows society the ability of a husband to care for his wife and family (Puoane *et al* 2002). An overweight woman is regarded as someone who is being well treated by her husband (Puoane *et al* 2005a). It also indicates the availability of a sufficient food supply and intake, as food is associated with pleasure and comfort in areas where there is a high prevalence of food insecurity (Okop *et al* 2016; Mvo *et al* 1999). In urban areas, a common practice among the black culture is to consume large portion sizes to gain respect from neighbours, because food security indicates self-sufficiency (Puoane & Tsolekile 2008). Being overweight is associated with happiness as it shows that the person does not lack anything (Okop *et al* 2016; Mchiza *et al* 2011). Those who migrated to urban areas were often envied or complimented if they were overweight or obese when they visited rural areas as this indicated that they could afford to eat (Puoane & Tsolekile 2008). Although obesity, which used to mainly affect people of higher socio-economic classes, now equally affects the poor, it is difficult to change the perception that obese people are wealthy, while thin people are poor or sick (Matoti-Mvalo & Puoane 2011).

### *Health and Sickness*

Many SA black women preferred to be big rather than thin as being overweight indicates good health (Puoane *et al* 2005b; Mvo *et al* 1999). Thinness indicates sickness such as tuberculosis (TB) and cancer, physical stress, unhappiness, emotional stress and depression (Okop *et al* 2016; Mvo *et al* 1999). In SA, weight loss is associated with HIV/AIDS amongst the black population (Matoti-Mvalo & Puoane 2011; Puoane *et al* 2005b; Mvo *et al* 1999). Puoane *et al* (2005b) reported that SA black women were not motivated to do any sort of physical activity for fear of losing weight and thus being stigmatized as being infected with HIV/AIDS.

Out of 513 black SA women, 69.3% (356/513) associated the thin figures from the Stunkard FRS with a person infected with HIV/AIDS (Matoti-Mvalo & Puoane 2011). None associated overweight/obese figures with the disease. Nearly a third (31.0%, 159/513) associated being overweight with health, while almost a quarter (24.0%,

123/513) thought that being obese indicated health. Only 34.2% (175/513) thought that a normal weight represented a healthy person. Despite being aware of the risks associated with excess body weight, some (41.3%) still preferred to be overweight or obese because they were afraid of losing weight due to the stigma attached to a small body size (Matoti-Mvalo & Puoane 2011).

It is crucial to understand the beliefs associated with body image perception to be able to address the prevalence of overweight and obesity in SA. It is impossible to address overweight and obesity, if the person does not perceive themselves as being overweight or obese or desire to reduce weight, because of cultural beliefs. This cross-sectional descriptive study was therefore very important as it further investigated body image perception amongst educated black women in the nursing profession who should understand the concept and consequences of overweight and obesity and should therefore have adopted healthy eating and lifestyle behaviours.

To address these cultural misconceptions, it is essential to identify factors such as the influence of the media and education on the cultural beliefs impacting body image perception amongst black SA women.

### 2.3.2 The influence of media

Throughout history, body image has been influenced by various factors including media (Derenne & Beresin 2006). Exposure to mass media such as television (TV), movies, magazines and the internet is positively correlated with obesity and can influence people to lose weight (Derenne & Beresin 2006). Media promotion of the ideal body as thinness for women has caused an increasing number of young adults to report dissatisfaction with their bodies, as well as an increase in the use of weight control products (Luevorasirikul 2007). In general, both locally and internationally, there has been an increase in body image dissatisfaction (BID) and eating disturbances due to society largely publicizing a thin body as ideal for women, thus causing them to objectify their bodies (Morry & Staska 2001).

Radio and TV are the most common source of nutrition information for urban black SA women (Van Der Merwe & Pepper 2006). As the economy improves, media influences extended further into disadvantaged areas causing black SA women to be increasingly exposed to conflicting body size ideals (Micklesfield *et al* 2013). In SA, the emphasis on thinness by the media is very evident by the ever-increasing number of advertisements, promoting dieting and encouraging thinness, as well as by the availability of a wide range of low-energy diets on the market and the many business organizations which specifically promote weight loss (Edwards, d'Agrela, Geach & Welman 2003).

A survey carried out by Edwards *et al* (2003) on 39 black and 41 white females at high schools and universities in SA, showed that intentionally or unintentionally, all women regardless of race competed with the media and each other to increase their sense of self-worth and social acceptability. Several studies reported disordered eating attitudes and high levels of body dissatisfaction with the desire to be thinner amongst middle-aged black women (Mchiza *et al* 2011; Puoane *et al* 2005a; Mchiza *et al* 2005). The 'Big is Beautiful' study in Cape Town by Puoane *et al* (2005b) demonstrated that although black women usually preferred a woman to be moderately obese, they themselves desired to lose weight, thus showing the possible effects of media influences on body dissatisfaction. In the older generation of the SA black culture, a curvy woman is still admired. The younger ones who are more exposed to media images which portray thin women as attractive, get confused as they want to have a body shape according to their cultural beliefs, but they also want to follow the media (Puoane *et al* 2005b).

The cross-sectional analytical study at Mangaung University Community Partnership Project Healthcare Centre, Bloemfontein reported that out of the 28.6% (86/301) black women who perceived themselves as obese, 22.0% (19/86) were attempting to reduce weight through exercise and diet. They were asked if they read magazines and if they did, whether images of female bodies influenced or motivated them to lose or gain weight. Of the many (72.0%, 219/304) who read magazines, 58.0% (127/219) said that the body images portrayed in the magazines influenced them either positively or negatively (Prinsloo *et al* 2011).



The results from the first International Body Project, which measured 7434 individual preferred body sizes in twenty-six countries were reported by Swami, Frederick, Aavik, Alcalay, Allik, Anderson, Andrianto, Arora, Brännström, Cunningham, Danel, Doroszewicz, Forbes, Furnham, Greven, Halberstadt, Hao, Haubner, Hwang, Inman, Jaafar, Johansson, Jung, Keser, Kretzschmar, Lachenicht, Li, Locke, Lönnqvist, Lopez, Loutzenhiser, Maisel, McCabe, McCreary, McKibbin, Mussap, Neto, Nowell, Alampay, Pillai, Pokrajac-Bulian, Proyer, Quintelier, Ricciardelli, Rozmus-Wrzesinska, Ruch, Russo, Schütz, Shackelford, Shasidharan, Simonetti, Sinniah, Swami M, Vandermassen, van Duynslaeger, Verkasalo, Voracek, Yee, Zhang E, Zhang X & Zivcic-Becirevic (2010). Participants self-reported their exposure to both western and local media. Results demonstrated that in SA, 105 rural participants residing in KZN who were less exposed to western media selected significantly larger ideal body sizes when compared to 100 urban participants in Cape Town, who were exposed to western media and preferred a thinner figure (Swami *et al* 2010).

A potential shift in attitudes and perceptions regarding body weight has been demonstrated amongst black SA women due to media influences, which portray thin images as being attractive (Mchiza *et al* 2011; Puoane *et al* 2005b; Mciza *et al* 2005). The media therefore does play a large role in the development of body image ideals and could be used to implement weight loss strategies to decrease the prevalence of overweight and obesity amongst black SA women. This study is very relevant as it investigated the current impact of media on cultural beliefs and whether there has been a further shift in attitudes.

### 2.3.3 Education

Education may enable an individual to correctly perceive their body image (Prinsloo *et al* 2011) as it improves health knowledge, which in turn could translate into a better choice of health behaviours. The health knowledge of South Africans could be targeted to help reduce the prevalence of both obesity and NCDs (Shisana *et al* 2013).

Low education was one of the most commonly reported causative factors regarding the increasing prevalence of global obesity (Senekal, Steyn & Nel 2003), although this remains controversial. People with an education of less than Grade 7 were more at risk of having a BMI greater than 25.0 kg/m<sup>2</sup> due to their lack of knowledge regarding healthy lifestyle choices (Senekal *et al* 2003)<sup>4</sup>. Under the Apartheid laws, black South Africans had very limited exposure to education (Micklesfield *et al* 2013) which could be one causative factor regarding the high prevalence of overweight and obesity amongst them.

Ziraba, Fotso & Ochako (2009) used the Demographic and Health Survey's data from 1992 to 2005 from seven African countries, to demonstrate that there was an increase in the prevalence of overweight and obesity by 45-50% among non-educated and primary-educated African women, while there was a decrease by 10.0% amongst African women with secondary education or higher. This suggests that the education level may be influential in weight loss since women with higher education would most likely make healthy eating and lifestyle choices.

Conversely, Bourne, Lambert & Steyn (2002) who reviewed and analysed secondary data from the existing literature, mentioned that black SA women with no education were found to have a lower mean BMI as they were involved in more manual labour than their better-educated counterparts. These findings were similar to the study conducted in Bloemfontein by Prinsloo *et al* (2011) which reported that 83.9% (99/118) of obese women were educated to a secondary level or higher. Matoti-Mvalo & Puoane (2011), concluded that cultural beliefs had a significant influence on black SA women despite more than half having a Grade 7-12 education.

If education supposedly decreases the prevalence of overweight and obesity, health professionals such as nurses, who have been educated regarding the consequences of obesity, should demonstrate a lower prevalence as a consequence of the adoption of healthy behaviours.

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<sup>4</sup> Grade 7-12 education: In SA, secondary education consists of two phases; the senior phase (grades 7-9) and training phase (grades 10-12) (EP-Nuffic 2015).

## 2.4 HEALTHCARE WORKERS

Healthcare workers (HCW) are considered to be health professionals who are supposed to have a good knowledge about health promotion, as well as act as role models for their patients (Skaal & Pengpid 2011). With health promotion being one of the main priorities of health care, the teaching role of HCWs such as nurses is more significant than ever and the trustworthiness of nurses as health educators is linked to the expectation that they portray healthy behaviours (Rush *et al* 2005). The prevalence of overweight and obesity should therefore be lower amongst HCW, including nurses.

### 2.4.1 Prevalence of overweight and obesity amongst healthcare workers worldwide

A cross-sectional study carried out on 76 HCWs in Mexico showed that the prevalence of overweight and obesity amongst female HCWs was 26.0% and 52.0%, respectively compared to male HCWs who had a prevalence of 63.0% overweight and 23.0% obesity (González-Velázquez & Mendez 2007).

A cross-sectional study which included 13483 adults in Scotland aimed to investigate the prevalence of overweight and obesity amongst 411 nurses, 320 other HCWs, 685 unqualified health care staff and 12067 in non-health related occupations. The prevalence of overweight (39.7%) and obesity (29.4%) was significantly higher amongst nurses (69.1%), than other healthcare professionals; seven out of ten nurses in Scotland were either overweight or obese with a mean BMI of 27.9 kg/m<sup>2</sup>, which is overweight (Kyle *et al* 2016).

### 2.4.2 Prevalence of overweight and obesity amongst nurses worldwide

A survey was mailed to 4890 randomly selected registered nurses from one state in six geographic regions in United States of America (USA). The response rate was 15.5% (n=760) of which 749 had provided their weight and height measurements. The mean BMI was 27.2 kg/m<sup>2</sup>, while the prevalence of overweight was 30.6% and obesity was 23.6% (Miller, Alpert & Cross 2008) which was high (54.2%). In 2011, Zitkus conducted

a cross sectional descriptive study on 721 registered nurses who were recruited from the American Academy of Nurse Practitioners in the USA (Zitkus 2011). The prevalence of overweight was 30.0% and obesity was 27.0% amongst the nurses, indicating an increase of 2.8% over three years.

A cross-sectional study of self-reported survey data was carried out by Bogossian, Hepworth, Leong, Flaws, Gibbons, Benefer & Turner (2012) on 4996 nurses from Australia (n=3144), New Zealand (n=778) and United Kingdom (UK) (n=1074). The prevalence of overweight and obesity combined was 59.1% for UK, 61.3% for Australia and 61.8% for New Zealand which was higher than the USA.

Internationally, the prevalence of overweight and obesity amongst nurses have been observed to be lowest in USA (54.2% - 57.0%) (Zitkus 2011; Miller *et al* 2008), followed by UK (59.1%), Australia (61.3%), New Zealand (61.8%) (Bogossian *et al* 2012) and Scotland (69.1%) (Kyle *et al* 2016), showing that the prevalence of overweight and obesity is high amongst nurses despite being educated HCWs.

#### 2.4.3 Prevalence of overweight and obesity amongst healthcare workers in South Africa

South African studies have shown that overweight and obesity may be as prevalent in the nursing profession as it is for the general public (Goon, Maputle, Olukoga, Lebeso, Khoza & Ayanwu 2013; Skaal & Pengpid 2011; Van Den Berg, Okeyo, Dannhauser & Nel 2012). A quantitative, cross-sectional study consisting of 100 HCWs including nurses and 100 non-HCWs was carried out in Pretoria to determine the prevalence of overweight and obesity, obesity-related health problems as well as their perceptions regarding their own body weight using the Stunkard FRS (Skaal & Pengpid 2011). The results showed a high prevalence of overweight and obesity, particularly in females (Table 2.3). Regardless of the various levels of education and profession, there was no major difference in the prevalence of obesity between HCWs and non-HCWs (Skaal & Pengpid 2011). Although Senekal *et al* (2003) acknowledged poverty and low levels of

education as risk factors for overweight/obesity in SA, in this study, Skaal & Pengpid (2011), demonstrated that education did not impact the prevalence of obesity.

**Table 2.3:** The prevalence of overweight and obesity between gender and job category amongst healthcare workers (Skaal & Pengpid 2011).

		Normal weight %(n)	Overweight %(n)	Obese %(n)	Severely obese %(n)
Total (n=200)		26.5 (53)	26.5 (53)	37.5 (75)	9.5 (19)
<b>Gender</b>	Male (n=38)	39.5 (15)	50.0 (19)	7.9 (3)	2.6 (1)
	Female (n=162)	23.5 (38)	21.0 (34)	44.4 (72)	11.1 (18)
<b>Job category</b>	Healthcare workers (n=100)	26.0 (26)	30.0 (30)	35.0 (35)	9.0 (9)
	Non healthcare workers (n=100)	27.0 (27)	23.0 (23)	40.0 (40)	10.0 (10)

#### 2.4.4 Prevalence of overweight and obesity amongst nurses in South Africa

As overweight and obesity is more prevalent among black South Africans, especially amongst women, Goon *et al* (2013) conducted a cross-sectional study on 153 black nurses of both genders, who were practicing in the province of Limpopo. Their mean BMI was 31.7 kg/m<sup>2</sup> which was obese class I and was higher than that of the general male (23.2 kg/m<sup>2</sup>) and female (29.0 kg/m<sup>2</sup>) SA population (Shisana *et al* 2013). The prevalence of overweight, obesity and severe obesity was 27.5%, 44.4% and 7.2%, respectively (Table 2.4). The prevalence of overweight was lower (27.5%) compared to that of the general black population in SA (44.0%), while the prevalence of obesity was

higher (51.6%), compared to that of the general black population (49.3%) (Shisana *et al* 2013).

**Table 2.4:** Prevalence of overweight and obesity amongst male and female nurses (Goon *et al* 2013).

<b>Prevalence</b>	<b>Underweight %(n)</b>	<b>Normal weight %(n)</b>	<b>Overweight %(n)</b>	<b>Obese %(n)</b>	<b>Severely obese %(n)</b>
Total (n=153)	2.0 (3)	19.0 (29)	27.5 (42)	44.4 (68)	7.2 (11)
Male (n=49)	2.0 (1)	24.5 (12)	30.6 (15)	36.7 (18)	6.1 (3)
Female (n=104)	1.9 (2)	16.3 (17)	26.0 (27)	48.1 (50)	7.7 (8)

The prevalence of overweight and obesity was higher in the female nurses (81.8%) (Goon *et al* 2013) when compared to the SA HCW (74.0%) in the study by Skaal & Pengpid (2011).

A cross-sectional descriptive survey was conducted by Van Den Berg *et al* (2012) on 161 undergraduate nursing students of both genders from University of Fort Hare in Eastern Cape. The prevalence of overweight and obesity amongst females was 36.4% and 21.8% respectively. They also had poor eating habits and inadequate nutritional knowledge. The prevalence of overweight and obesity could have been lower amongst these nursing students due to a lower mean age (24.9 years) and a lower BMI could have been expected too because other studies (Goon *et al* 2013) have shown that those who are older tend to have a higher BMI.

Studies, both internationally and locally have demonstrated that the prevalence of overweight and obesity is high amongst nurses, including female nurses in SA. Before being able to develop and implement strategies to address this situation, it is very

important to investigate the risk factors which could make it difficult for nurses as a profession to maintain a normal body weight.

## 2.5 RISK FACTORS FOR OVERWEIGHT AND OBESITY AMONGST NURSES

Several studies, locally and internationally, have identified time constraints, working hours, place of work, shift times and inability to access healthy food as the potential risk factors for weight gain amongst nurses. This section discusses the risk factors further.

### 2.5.1 Time constraints

A review of lifestyle patterns, eating practices and obesity amongst nurses in general was conducted by Shipra Gupta (2016) who acknowledged that work-related stressors, particularly a lack of time, influenced the ability of nurses to engage in regular exercise, despite being aware of the need for regular physical activity. Naidoo & Coopoo (2007) conducted a quantitative survey on 107 nurses in KZN, SA to determine their health and fitness profiles and reported poor physical activity levels. Phiri, Draper, Lambert & Kolbe-Alexander (2014) conducted 12 focus group discussions (FDGs), consisting of 103 participants which included 57 night-shift nurses and 36 day-shift nurses in public hospitals of the Western Cape Metropole, SA. The aim of this study was to determine the health concerns, health priorities and barriers to living a healthy lifestyle amongst the nurses. The nurses frequently mentioned lack of time to prepare healthy meals as being an obstacle to weight loss or weight control (Phiri *et al* 2014).

### 2.5.2 Working hours and shift times

According to Han, Trinkoff, Storr & Geiger-Brown (2011) who conducted a secondary data analysis on 2103 female nurses in USA, long working hours were reported to adversely affect their energy levels and frequency of exercise. Adverse work schedules could lead to obesity as shift work or long working hours may disrupt normal eating hours and reduce access to healthy food options (Han *et al* 2011). A baseline survey

conducted on 194 nurses in the USA by Zapka, Lemon, Magner & Hale (2009) investigating lifestyle behaviours of hospital-based nurses, reported that working hours resulted in nurses not being released at adequate times for breaks and meals. Phiri *et al* (2014) found that long working hours and shift work resulted in being overtired.

### 2.5.3 Place of work

The physical demands were reported to be highest for staff nurses and nurses working in critical care and emergency or operating room/post anaesthesia units. These units were highly stressful for many nurses who did not get adequate time for a proper meal (Trinkoff, Storr & Lipscomb 2001).

### 2.5.4 Accessibility of healthy food

The hospital environment itself was perceived to have a harmful influence on the nurses' lifestyle behaviours, including the food service that offered mostly unhealthy foods in the USA (Han *et al* 2011). In SA, day shift nurses agreed that the hospital cafeterias sold mostly unhealthy foods such as fried chicken, French fries and pastries. Healthier foods such as fruits and salads were costly, therefore they chose the unhealthier options which were cheaper. Night shift nurses reported that the cafeteria was closed at night (Phiri *et al* 2014) and therefore resorted to eating unhealthy food (high in salt and sugar) from vending machines or prepacked food (Trinkoff *et al* 2001).

It is therefore essential to provide healthy vending machine choices and food services to the work unit to increase food quality and access to healthy food choices for the nurses particularly those on night shift (Han *et al* 2011).

An understanding of all these risk factors is important to plan suitable diet and lifestyle-related interventions for nurses to promote optimum health and prevent overweight and obesity (Shipra Gupta 2016). In addition, it is also important to investigate body image perception as underestimating body image could be an important cause of the high prevalence of overweight and obesity amongst nurses.



### 2.5.5 Body image perception of healthcare workers

It has been observed that HCWs in general tend to underestimate their body image by thinking they are thinner than they actually are (Skaal & Pengpid 2011; Puoane *et al* 2005b).

In the study on HCWs versus non-HCWs conducted in Pretoria by Skaal & Pengpid (2011), despite 73.5% of the total sample being either overweight/obese/severely obese, when asked about their body weight satisfaction, 56.0% of the HCWs indicated satisfaction with their current weight versus 61.0% of the non HCWs. Overweight staff (73.6%; 39/53) perceived themselves as being normal weight while more than half (57.3%; 54/94) of obese staff also perceived themselves as being of normal weight. Of these obese staff, 40.0% (38/94) perceived themselves as being overweight. Additionally, 66.8% (13/19) of severely obese participants perceived themselves as overweight, 10.0% (2/19) of which also perceived their weight as normal (Skaal & Pengpid 2011).

In a similar manner to the general population, HCWs tended to underestimate their body image. Body image perception has been investigated by many studies internationally and locally and different tools have been used throughout. As this study investigated body image perception, it was critical to choose an appropriate tool which had been validated in SA and was comparable to those used in other local studies. A detailed description follows for the different tools used to assess body image perception in the African continent.

## 2.6 ASSESSMENT OF BODY IMAGE

Various techniques have been developed to assess different aspects of body image, especially BID. To date, body image perception has been assessed through both qualitative and quantitative methods, including interviews, focus groups, figural scales, photographs, questionnaires and examination of cognitive, affective and behavioral functioning (Gardner & Brown 2010). The most commonly used methods are the figural scales because of their ability to depict various human body sizes (Cohen, Bernard,

Ponty, Ndao, Amougou, Saïd-Mohamed & Pasquet 2015). Figural scales will be discussed in more details.

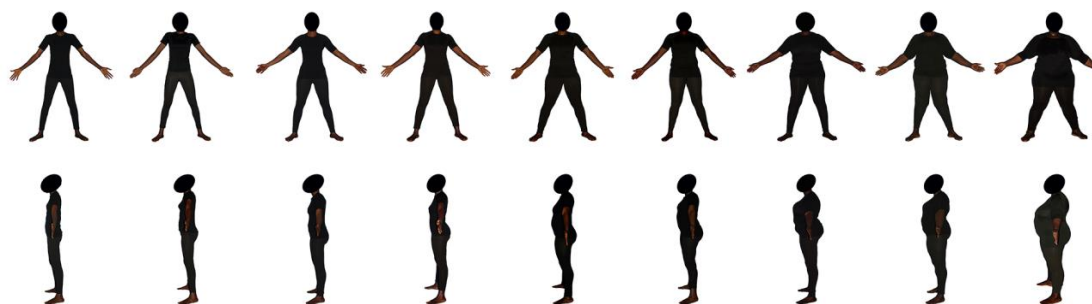
### 2.6.1 Figural scales

Figural scales or FRS are also referred to as silhouettes or contour line drawings and consist of a series of frontal drawings or images, usually nine, ranging from underweight to obese class III. Participants are asked to select the image that mostly represents their current and ideal body size. Even though researchers have developed dozens of these scales, numerous problems continue to be identified with their use and it has been observed that reliability and validity measures are absent for the majority (Gardner & Brown 2010). Although there is a wide range of validated scales that have been used both internationally and locally, it was extremely important to choose a scale for this study that was culturally appropriate, and which had been validated and adapted for use in SA.

#### 2.6.1.1 *Figural scale used in Cameroon*

The study by Cohen *et al* (2015) aimed to develop and validate the Body Size Scale (BSS) to estimate African body weight perception, as they felt that the existing scales were usually not accurate enough to assess body weight perception in different African populations, since existing African scales were usually based on White Caucasian populations. Eighty Cameroonians and 81 Senegalese participated to develop the BSS. Children, adolescents, elderly and pregnant women were excluded and only individuals of reproductive age were recruited. They were photographed in full face and profile positions. Anthropometric measurements were taken to evaluate their BMI, body fat percentage, body fat distribution and body type. Nine participants per gender group were selected as models for the BSS, after carefully ensuring representative anthropometric variability and progressive adiposity gain along the scale. The BMI frequency distribution led to the following number of models per BMI category: one in underweight ( $< 18.5 \text{ kg/m}^2$ ), three in normal weight ( $18.5\text{-}24.9 \text{ kg/m}^2$ ), two in overweight

(25.0-29.9 kg/m<sup>2</sup>) and one in each class of obesity level as defined by WHO (30.0 < BMI 34.9 < 39.9 kg/m<sup>2</sup>), as shown in Figure 2.1.



BMI (kg/m <sup>2</sup> )	16.11	20.02	21.57	24.09	25.27	29.88	33.07	38.78	49.99
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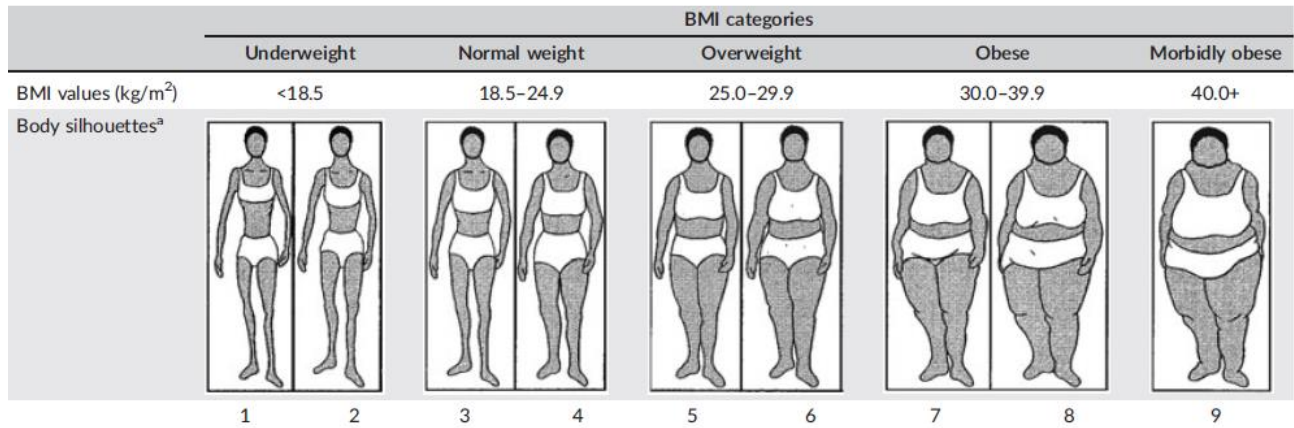
**Figure 2.1:** Female body size scale used in Cameroon

To validate the BSS, 1419 Cameroonians were randomly selected from both urban and rural areas (Cohen *et al* 2015). They were asked to rearrange the BSS models by increasing adiposity along the scale. Each participant's current body size and desired body size were evaluated by asking them to point at the model which looked like them the most, and which one they most wanted to look like. The validation protocol proved the BSS reliability for estimating body weight perception in Africans. Despite the similarity to the Stunkard FRS, the main limitation of the BSS was that it has been validated in the Cameroon only and therefore could not be used in this study.

#### 2.6.1.2 *Figural scale used in Malawi*

These silhouettes (Figure 2.2) have been validated in Southern Africa by Mciza *et al* (2005) and have previously been used in Malawi. There are nine line drawings of body image silhouettes ranging from very thin to very large which were used to assess body image perception as shown in Figure 2.2. This study consisted of in-depth interviews with 64 HIV-positive women which was conducted in two urban and two rural government clinics in Lilongwe District, Mawali (Croffut, Hamela, Mofolo, Maman, Hosseinipour, Hoffman, Bentley & Flax 2017). Anthropometric data was collected to calculate BMI. Participants were asked to select their current figure, the figure they would like to be and the figure they associated most with health (Croffut *et al* 2017).

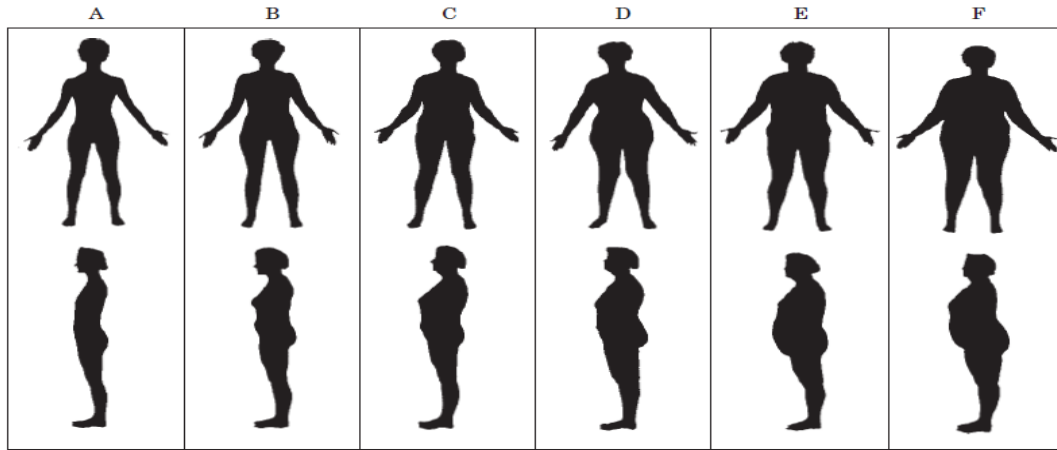
These silhouettes have not been used in any studies in SA and were therefore not considered for use in this study.



**Figure 2.2:** Silhouettes used in Malawi validated by Mciza *et al* (2005).

### 2.6.1.3 Figural scale used in Senegal

As shown in Figure 2.3, the six photographic silhouettes were developed in Glasgow in a sample of 259 Italian, South Asian and general population female participants between 20 to 40 years of age (Bush, Williams, Lean & Anderson 2001). Those who were pregnant or had delivered in the previous four months or had been breastfeeding for less than 6 months and those with a BMI of less than 20.0 kg/m<sup>2</sup>, were excluded. Measurements included age, height, weight, waist circumference, hip circumference, BMI and waist/hip ratio. The silhouettes, representing BMIs of 20.0 kg/m<sup>2</sup>, 24.0 kg/m<sup>2</sup>, 28.0 kg/m<sup>2</sup>, 30.0 kg/m<sup>2</sup>, 33.0 kg/m<sup>2</sup> and 38.0 kg/m<sup>2</sup>, were labelled using the alphabet so that the participants were unaware of BMI values. To validate this scale, participants were asked to arrange the silhouettes in ascending order of BMI as well as answer questions related to marriage, health, diet, and healthy children using the silhouettes (Bush *et al* 2001).



BMI	20	24	28	30	33	38
(kg/m <sup>2</sup> )						

**Figure 2.3:** Photographic silhouettes used in Senegal

These photographic silhouettes were used in a cross-sectional, population-based study including 301 randomly selected Senegalese (Dakar) women of ages 20 to 50 years. Pregnant women were excluded. Participants were asked to choose one silhouette for each of the 32 questions associated to attitudes and perceptions of body size (Holdsworth, Gartner, Landais, Maire & Delpuech 2004). Since this scale has not been validated for use in SA, it was not considered for use in this study.

#### 2.6.1.4 *Figural scale used in Kenya*

The sex-specific validated body image rating figures (BIRF) named the body image assessment for obesity (BIA-O) was originally developed and validated in a sample of 1209 adult Caucasian and African-American men and women in Louisiana State, USA (Williamson, Womble, Zucker, Reas, White, Blouin & Greenway 2000). The scale was then used in a cross-sectional survey amongst adults in the slums of Nairobi, Kenya (Ettarh, Van de Vijver, Oti & Kyobutungi 2013), which included 4934 randomly selected adults of both genders. Height and weight were measured during interviews and BMI was calculated. Perceptions of current and ideal body image were determined using 18 silhouette drawings of body sizes ranging from very thin to very obese (Figure 2.4). Images one to five represent underweight, images six to nine represent normal weight,

images 10-13 represent overweight and images 14-18 represent obese individuals. This scale has previously been used in SA.

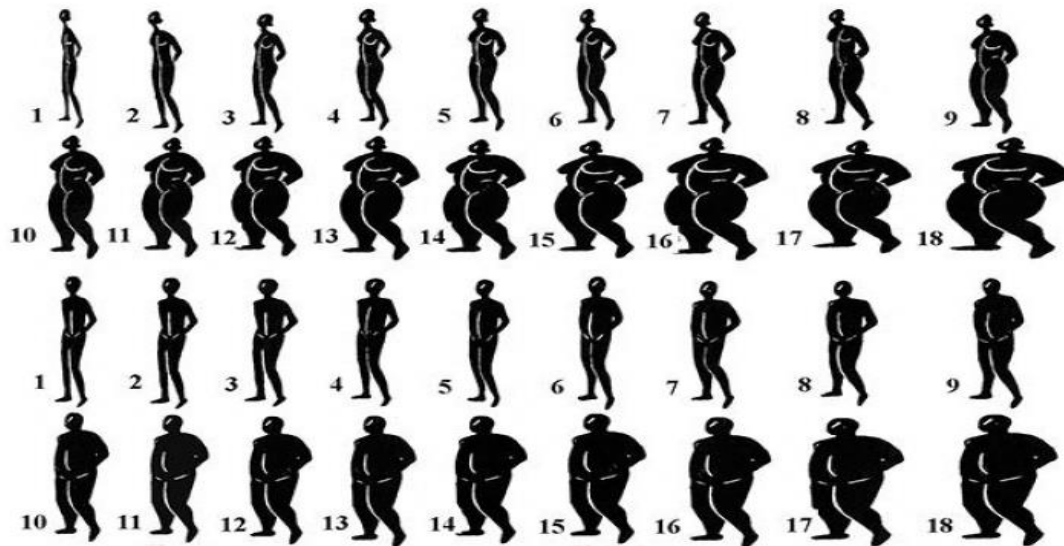


Figure 2.4: The body image assessment for obesity (BIA-O)

#### 2.6.1.5 Figural scales/photographs used in South Africa

##### Body Image Assessment for obesity (BIA-O)

This scale was used in an urban township in Cape Town, SA where semi-structured focus group discussions were conducted with 78 black men and women aged 35 to 70 years (Okop *et al* 2016). Participants were classified into normal weight, overweight and obese groups according to their BMI (kg/m<sup>2</sup>). Underweight participants were excluded from the study. Despite being used in Kenya and SA, this scale was still not validated for use in SA. Thus, it was not chosen for this study even though it was used on mainly black people.

##### Stunkard Silhouettes

The Stunkard silhouettes were originally developed for adult men and women in Denmark and validated by Stunkard, Sorenson & Schlusinger in 1983. The scale consists of nine silhouettes with a BMI assigned to each, ranging from underweight (BMI: <18.5 kg/m<sup>2</sup>) to obese class III (BMI: >40.0 kg/m<sup>2</sup>) (Figure 2.5). Participants are usually asked questions such as which silhouette resembles their body size and which

silhouette would they most likely prefer to see themselves as. Since then, the Stunkard FRS has been used in many studies worldwide including SA, to address body image perception in women of different races (Price, Gregory & Twells 2014; Devanathan *et al* 2013; Matoti-Mvalo & Puoane 2011; Mchiza *et al* 2011; Skaal & Pengpid 2011; Puoane, Tsolekile & Steyn 2010; Baptiste-Roberts, Gary, Bone, Hill, Brancati 2006; Mciza *et al* 2005; Puoane *et al* 2005b).

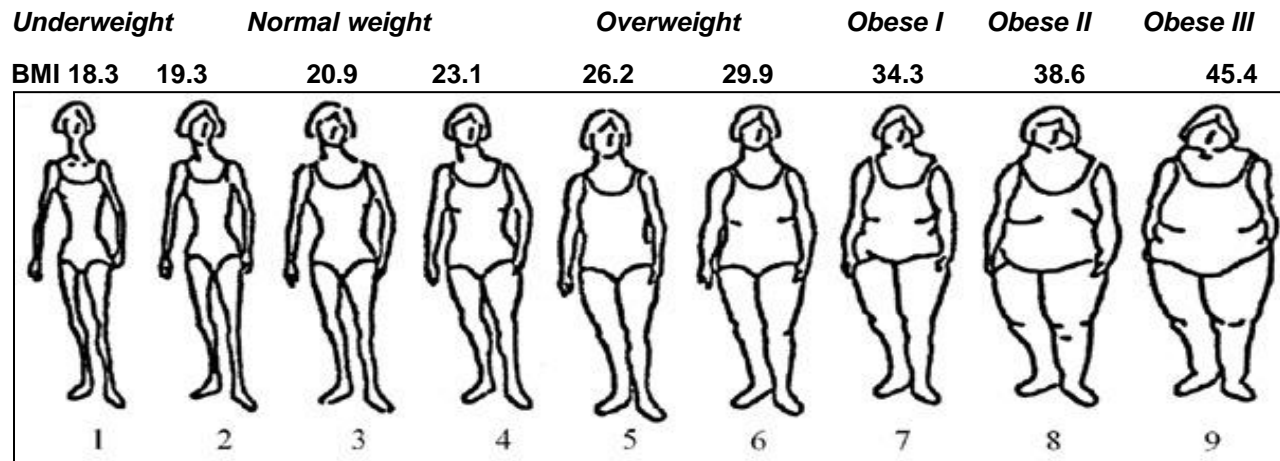


Figure 2.5: Stunkard figure rating scale

In SA, the Stunkard FRS has been the FRS of choice for studies determining the body image perception of black women and has been the most commonly used scale (Devanathan *et al* 2013; Matoti-Mvalo & Puoane 2011; Mchiza *et al* 2011; Skaal & Pengpid 2011; Puoane *et al* 2010; Mciza *et al* 2005; Puoane *et al* 2005b). Most importantly the Stunkard FRS was used in the SANHANES–1 to investigate the body image perception of SA adults of all races (Shisana *et al* 2013). The Stunkard FRS was therefore the FRS of choice for this study because several other studies in SA have used the Stunkard FRS to address body image perception amongst black women and this study investigated body image perception amongst black SA female nurses practicing in Durban, KZN. This FRS has already been validated and adapted for use in SA for use in multi-ethnic SA women (Mciza *et al* 2005).

### Photographs

Venter, Walsh, Slabber & Bester (2009) developed this photographic scale (Figure 2.6) to investigate the perceptions of SA black women regarding health, weight and

attractiveness as well as their perception of the reaction of the community towards obese and underweight people in Mangaung. A graded set of photographs with calculated BMIs was developed using a modification of the distorting photograph technique. A South African black female with a BMI of 22.7kg/m<sup>2</sup> was photographed. The picture was then scanned and distorted to produce both thinner and larger images as shown in Figure 2.6. The height was the same while the breadth was resized. In order, not to reduce or enlarge the size of the figures beyond reality, only five photographs were used instead of the whole series. Validity of the photographs was tested by 21 experts (registered dietitians), who viewed the photographs in random order and assigned a specific BMI value to each. The experts then classified the photographs in the correct order. Five hundred randomly chosen pre-menopausal black women participated in the study over a period of 25 weeks to validate this tool and make it reliable to provide quantitative information on perceptions of body size amongst black SA women (Venter *et al* 2009).



<18.5 kg/m <sup>2</sup>	18.5-19.9 kg/m <sup>2</sup>	20.0-24.9 kg/m <sup>2</sup>	25.0-29.9 kg/m <sup>2</sup>	>30.0 kg/m <sup>2</sup>
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Figure 2.6: Set of photographs used in Mangaung

Since this scale used only five figures as compared to the Stunkard FRS that has nine figures, it was not ideal to be used in this study. This scale was not validated in any other studies in SA.

## 2.7 CONCLUSION

In SA, the prevalence of overweight and obesity has increased over recent years. The prevalence is highest amongst black women with their cultural beliefs influencing their



perception regarding body image, being a major contributing factor. In the black culture, an overweight woman is associated with health, wealth, happiness, dignity and respect, while a thin woman is associated with HIV/AIDS, poverty and stressful times. Due to the perception regarding thin bodies within the culture, black SA women fear weight loss as a result of getting caught in the stigmas of HIV/AIDS. Addressing the misperception that only thin people are infected with HIV/AIDS may be beneficial as this may encourage them to lose weight. Black women in SA also tend to underestimate their actual body size, regarding themselves as being of normal weight when they are in fact either overweight or obese. There seems to be a shift in cultural beliefs as media now appears to have a greater influence on black women, encouraging them to lose weight, although cultural stigmas may prevent them from doing so.

It was expected that the prevalence of overweight and obesity would be lower amongst educated healthcare workers such as nurses, because they should be familiar with the consequences of obesity. A high prevalence of overweight and obesity, however, has been observed in nurses as well as a tendency to underestimate their body image. Time constraints, their long working hours/shift work and resultant fatigue, the area they work in and poor access to healthy food options imply that nurses may work in an obesogenic environment which could be contributing to the high prevalence of overweight/obesity amongst them.

In this study, it was essential to choose the correct FRS to investigate body image perception for the results to be both reliable and valid. The Stunkard FRS was used in this study as this FRS has been validated and adapted for use in SA, and as most of the studies in SA have used this scale, it allowed for comparison of the results. Developing and implementing culturally sensitive weight loss strategies are therefore very important to address the obesity epidemic facing both the general population and black female nurses in SA. It was important to investigate the potential influence of media on body image amongst this population to determine media's role as a vehicle in effectively delivering weight loss strategies to combat the high prevalence of overweight and obesity.

## CHAPTER 3:        **METHODOLOGY**

This chapter discusses the study design, study population, sample selection, study methods and materials. It also discusses the measuring instruments, data collection, pilot study, variables included in the study, data capturing and statistical analysis as well as data quality control and ethical considerations.

### 3.1    TYPE OF STUDY

This was a cross-sectional descriptive study conducted on black South African female nurses practicing at Netcare St Augustine’s Hospital, Durban, KZN, SA in July-August 2017.

### 3.2    BACKGROUND INFORMATION ON THE STUDY SITE

St Augustine’s hospital is a private 470-bed facility situated in Durban, KZN and is part of the Netcare group (Figure 3.1). It is the largest private hospital in the area and therefore employs the highest number of nurses which made it a good choice as the sample was likely to be representative of the black nursing population in Durban.



Figure 3.1: St Augustine’s Hospital

### 3.3 STUDY DESIGN

This study was a descriptive cross-sectional study and according to Levin (2006), cross-sectional studies are usually carried over a short period of time or at one given time to estimate the prevalence of the outcome of interest for a given population. A cross-sectional study design is used when the purpose of the study is descriptive, usually in the form of a survey. The aim is to describe a population or subgroup within a population regarding an outcome and a set of risk factors for the population or subgroups at a given time (Levin 2006). Many cross-sectional studies are done using questionnaires (Levin 2006).

The advantages of a cross-sectional descriptive study design include that it is quick and cost effective as well as the best way to determine prevalence. Multiple outcomes can be studied and since there is no follow up, fewer resources are required to run the study (Mann 2003). The disadvantages of a cross-sectional descriptive study design include differentiating cause and effect from simple association as there are frequently a number of reasonable explanations (Mann 2003). Therefore, using a cross sectional approach for this study was appropriate because this study investigated the prevalence of overweight and obesity over a short period of time.

Descriptive research can either be qualitative or quantitative which involves collecting data that describes events which outline data such as mean, median, mode, deviance from the mean, variation, percentage and correlation between the variables (Knupfer & McLellon 1996, p1197).

The advantages of using descriptive studies include data that is already available which can be used efficiently at a low cost (Grimes & Schulz 2002). The disadvantages of using descriptive studies are that casual conclusions can be drawn by researchers when none is possible. This may overstep the data and result in unclear associations between supposedly causes and effects over time (Grimes & Schulz 2002). Therefore, a descriptive approach for this study was appropriate because both quantitative and qualitative data was collected to investigate prevalence of overweight and obesity and factors influencing body image perception amongst black female nurses practicing in KZN, SA.

## 3.4 STUDY POPULATION AND SAMPLE SELECTION

### 3.4.1 Study population

The study population consisted of 152 black African female nurses between 21 to 66 years of age practicing at Netcare St Augustine's Hospital during the period of 24<sup>th</sup> July 2017 to 31<sup>st</sup> August 2017.

### 3.4.2 Sample selection

The total population sampling technique was used as all the black African female nurses (n=225) employed by St Augustine's hospital who complied with the inclusion and exclusion criteria were invited to participate.

According to Lund Research (2012), total population sampling is a type of purposive sampling technique whereby the entire population is chosen to participate in a study.

The advantages of total population sampling include the possibility of getting deep understanding by reducing the risk of missing information and the ability to make analytical generalization (Lund Research 2012). The disadvantages of total population sampling are that it is time consuming and challenging. If a large proportion of members choose not to participate, analytical generalization can be severely compromised (Lund Research 2012).

#### 3.4.2.1 The inclusion criteria include:

- Black ethnicity
- Female
- Nurses employed at St Augustine's Hospital

#### 3.4.2.2 The exclusion criteria include:

- Ethnicity other than black SA
- Male

- Nurses not employed as St Augustine's Hospital
- Pregnancy
- Renal impairment
- Oedema
- Pacemakers
- Artificial limbs
- Any black African nurse who grew up following a different culture such as the White or Indian culture.

Pregnancy, renal impairment, oedema, pacemakers and artificial limbs were listed as exclusion criteria as they would interfere with the bioelectrical impedance analysis and produce inaccurate results.

#### 3.4.2.3 Outcome variables

These included demographics (age, culture, area they grew up in), years of nursing experience, career choice satisfaction, being a role model, body composition (weight, height, BMI, body fat percentage and mass, FFM). Cultural beliefs and factors influencing the nurses' perceptions about body image such as media, family beliefs, their perceived current and desired body shapes related to the Stunkard FRS as well as factors that are barriers to body weight control were also outcome variables.

#### 3.4.2.4 Confounding variables

These included medical conditions and medications that affect body weight.

### 3.5 STUDY METHODS AND MATERIALS

#### 3.5.1 Anthropometry

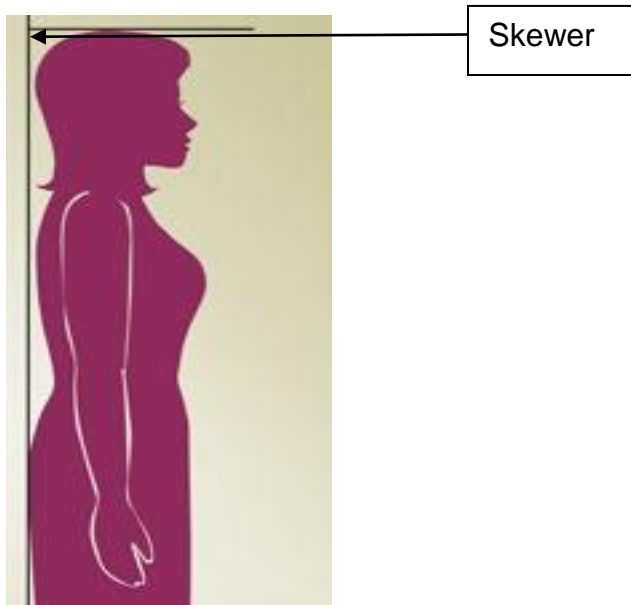
Anthropometric measurements included weight and height. These measurements were recorded on the data collection form (Appendix A).

#### 3.5.1.1 *Weight*

Weight was measured using a precision scale (AND UC-321, A&D Medical) with a capacity of 150 kg. The scale was calibrated with a known weight (5 kg Avery) every day before any measurements were taken. The scale was placed on a large ceramic tile where the floor was carpeted, to ensure that the scale was on a stable surface. Nurses were asked to remove shoes, socks, any heavy clothing and heavy objects such as mobile phones, wallets, loose change and heavy jewellery. The nurses stood on the centre of the scale with their weight evenly distributed on both legs with their arms hanging loose by their sides and looking straight ahead. They were asked to stand still while the measurement was being taken (WHO STEPS surveillance 2017). The weight was measured to two decimal places and recorded on the data collection sheet (Appendix A). The nurses were asked to step off the scale and the measurement was repeated, and the mean value was used. If the measurements differed by more than 0.01 kg, the weight was taken a third time and the two closest values were used to calculate the mean weight.

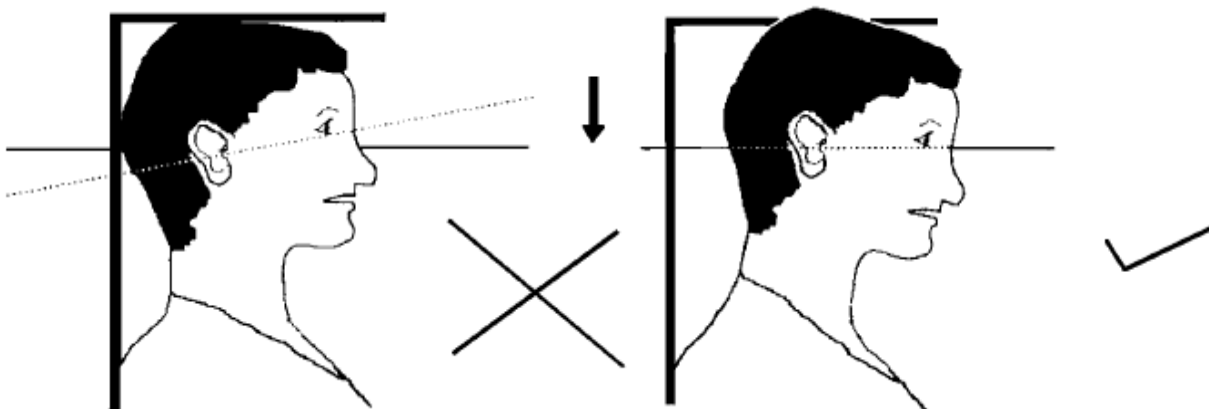
#### 3.5.1.2 *Inhaled height*

Height was measured using a portable stadiometer (SECA model 217) for adults with a measuring range of 20-220 cm. Height was taken without shoes and socks on and for nurses with high hairstyles, a skewer was inserted through their hair with their permission and then the reading was taken where the skewer touched the stadiometer as shown in Figure 3.2.



**Figure 3.2:** Depiction of how a skewer was inserted through the hair of nurses with high hairstyles and the reading was taken where the skewer touched the stadiometer.<sup>5</sup>

Nurses were required to stand on the stadiometer with their feet together and heels, buttocks and upper part of the back touching the stadiometer (Norton, Whittingham, Carter, Kerr, Gore & Marfell-Jones 1996, p37). As shown in Figure 3.3, when placed in the vertical Frankfort plane, the back of the head does not need to touch the stadiometer. For the Frankfort plane, the orbitale had to be in the same horizontal plane as the tragion.



**Figure 3.3:** The Frankfort plane (The Scottish Health Survey 2015)<sup>6</sup>

<sup>5</sup> <http://www.choirrobsonline.com/measure.php#height>. Permission for use was not required.

Nurses were instructed to take and hold a deep breath (inhaled height), keeping their head in the vertical Frankfort plane and the reading was recorded on the data collection form (Appendix A). Nurses were asked to step off the stadiometer and the measurement was repeated, and the mean value was used. If the measurements differed by more than 0.1 cm, the inhaled height was taken a third time and the two closest values were used to calculate the mean height.

#### 3.5.1.3 *Body mass index*

Body mass index was calculated by dividing the weight in kg over height in metres squared. For adults, the WHO (2017) defines underweight as a BMI less than 18.5 kg/m<sup>2</sup>, normal weight between 18.5 to 24.9 kg/m<sup>2</sup>, overweight between 25 to 29.9 kg/m<sup>2</sup>, obese class I between 30 to 34.9 kg/m<sup>2</sup>, obese class II between 35 to 39.9 kg/m<sup>2</sup> and obese class III as a BMI of 40.0 kg/m<sup>2</sup> or greater.

#### 3.5.2 Bioelectrical impedance analysis

Bioelectrical impedance analysis (BIA) is an accurate technique to measure body composition which is non-invasive and portable. It requires low maintenance and minimal operator training as well as being economical for quantitatively estimating body compartments (Barbosa-Silva & Barros 2005). Tetrapolar impedance is a valid and reliable method that can be useful in the field for assessing body composition at different frequencies (Lukaski *et al* 1986). According to Huang, Chen, Chuang, Chiang, Lu, Lin, Chen, Hsiao & Hsieh (2015), the QuadScan 4000 used in this study is commonly used to assess body composition and appears to represent a reasonable and practical application for assessing FFM. Kyle, Bosaeus, De Lorenzo, Deurenberg, Elia, Gomez, Heitmann, Kent-Smith, Melchior, Pirlich, Scharfetter, Schols & Pichard (2004) observed certain limitations regarding the reliability of FFM analysis using a two-compartment BIA model, which can be overcome with a multi-compartment model (QuadScan 4000, Bodystat, Douglas, Isle of Man) which was used in this study. The number of frequencies used is also important because according to Hannan, Cowen,

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<sup>6</sup> Permission of use granted by Julie Landsberg (Julie.landsberg@gov.scot)



Fearon, Plester, Falconer & Richardson (1994), by using single frequency, a proportion of the current is unable to penetrate the cell membranes passing only through the extracellular space. Therefore, a tetrapolar multi-frequency multi-compartment BIA device (QuadScan 4000) was used with impedance frequency values ranging from 5-200 kHz.

The device was calibrated daily before use by attaching the alligator clips of the four electrodes to a calibrator which is supplied for independent verification. The test was then performed as normal and if the impedance reading was between 500-505 kHz, the device was calibrated correctly.

Before taking any measurements, the nurses were asked if they had complied with the fasting criteria which included no caffeinated drinks and food in the previous four hours, no alcoholic drinks in the previous 24 hours as well as no exercise in the previous 12 hours. If compliant, they were asked to remove metal objects, such as jewellery, and instructed to lie down in the supine position, for five to ten minutes on a non-conductive mattress on a plinth, with arms extended from the chest by about 30° and legs separated by about 45°. According to Ellis, Shypailo & Wong (1999), it is recommended for the participant to lie in the supine position for several minutes before measurement to ensure a more even distribution of body water. The skin surfaces of the electrode sites were cleaned with an alcohol swab (Kyle *et al* 2004). The BIA electrodes were then placed on the dorsal surfaces of the right foot and hand. On the right hand, the electrodes were placed on the proximity of the metacarpal-phalangeal joint and medially between the distal prominences of the radius and the ulna. On the right foot, the electrodes were placed on the metatarsal-phalangeal joint and between the medial and lateral malleoli at the ankle, as shown in Figures 3.4 and 3.5 (Lukaski *et al* 1986), but were not connected to the machine.

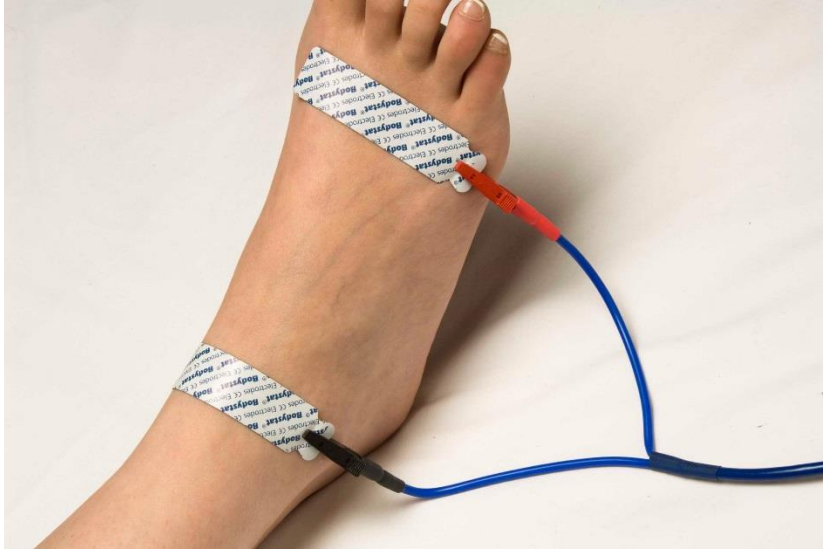


Figure 3.4: Placement of electrodes on dorsal surfaces of right ankle and foot (Bodystat 2014)<sup>7</sup>

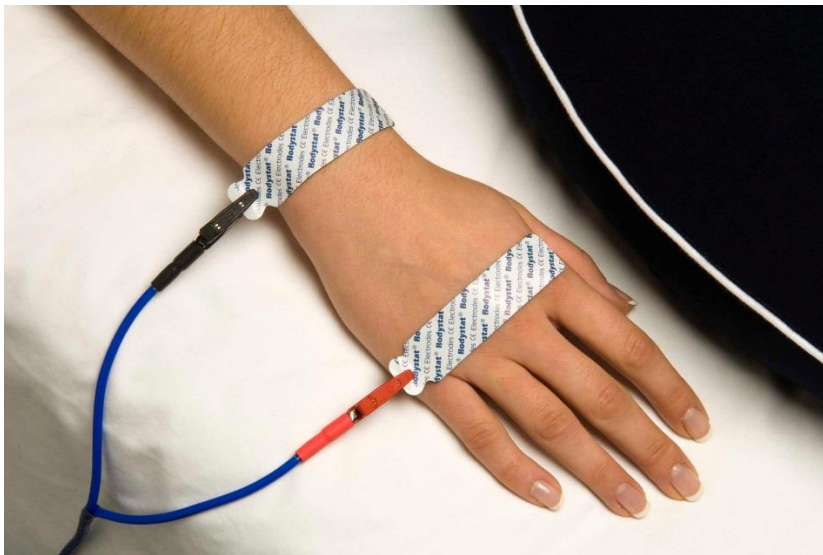


Figure 3.5: Placement of electrodes on dorsal surfaces of right wrist and hand (Bodystat 2014)

The BIA device was switched on, and the code generated for each test was recorded on the data collection form (Appendix A). The nurse's age, gender and anthropometric measurements were entered into the device. The electrodes were then connected to

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<sup>7</sup> Permission obtained for Figures 3.4 and 3.5 from Sian Meeuwssen (Head of Research & Marketing) Bodystat (sian@bodystat.com)

the machine and the enter button was pressed. The test took 11 seconds to run. The test was repeated. The test numbers were recorded on the data collection sheet (Appendix A). All data was stored on the device. When the data was downloaded to a computer (Table 3.1) and analysed, the mean of the two tests was used.

Table 3.1: Measurements from QuadScan 4000 (Bodystat 2014).

<b>THE QUADSCAN MEASURES</b>		
Body Composition	Hydration Status	Segmental Monitoring
Fat % and Mass*	Total Body Water – TBW*	Prediction Marker*
Lean % and Mass*	Intracellular Water – ICW*	Phase Angle at 50 kHz
Dry Lean Mass*	Extracellular Water – ECW*	Resistance at 50 kHz
Body Mass Index – BMI	Third Space Water*	Reactance at 50 kHz
Fat-Free Mass Index – FFMI*	Body Cell Mass*	Impedance Values at 5, 50, 100 and 200 kHz
Body Fat Mass Index – BFMI*		

\* means estimates

### 3.5.3 Questionnaire

A self-administered questionnaire with both open-ended and close-ended questions using the Likert scale was answered by the nurses (Appendix B).

Although questionnaires are cost effective and a large sample size can be used, it usually results in a low response rate (Mann 2003). Close-ended questions are quick to complete and easy to analyse (Rattray & Jones 2007). With open-ended questionnaires, participants have time to reflect on their answers (Knupfer & McLellan 1996, pp1200-1201).

The disadvantages of using questionnaires include lower response rates and the special care that is required to design questions that will be self-administered. Although all questionnaires should contain some open-ended questions to allow for participants' ideas to emerge, a considerable number of participants will not take the time to answer the open-ended questions thoroughly (Knupfer & McLellan 1996, pp1200-1201). Close-ended questions may limit the depth of participants' responses which can result in data with inadequate quality (Rattray & Jones 2007).

The advantages of using the Likert scale include that it is easy to construct and likely to produce a very reliable scale. It is also simple to understand and complete (Hartley 2013). The disadvantages of using the Likert scale are that participants can present a false impression of their attitudes by not being honest. It is difficult to show validity and there is a lack of reproducibility (Hartley 2013).

Validity refers to whether the questionnaire is measuring what it claims to. Content validity refers to expert opinion regarding whether the scale items used in the questionnaire address the areas being investigated (Rattray & Jones 2007). This questionnaire was validated for content by a statistician Dr Gill Hendry ([hendryfam@telkomsa.net](mailto:hendryfam@telkomsa.net)). The questions in this questionnaire were valid as they were mainly based on those used in other studies, or were based on findings from studies that investigated cultural beliefs that influence SA black women's perceptions about body image.

#### 3.5.3.1 *Section A*

This included basic demographics such as name and culture. Culture was asked because differences in beliefs were expected. The type of area they grew up in was included to determine if being raised in an urban or semi-urban environment altered their attitude towards body image perception as well as prevalence of overweight and obesity. Years of nursing experience were asked to determine whether overweight and obesity would be less prevalent in the more experienced nurses as they had longer to "practice what they preach". Job satisfaction and whether they saw themselves as role models were included because during the Apartheid era, very few job options were available to the black people and as a result, many black women took up nursing as a

career (Nursing Act 1957). This may have influenced their behaviour as a role model if they did not choose the career out of passion and hence did not adopt any healthy lifestyle behaviours.

#### 3.5.3.2 *Section B*

These questions were formulated to obtain information regarding confounding factors including medical conditions and medications that impact body weight (Wright & Aronne 2012; Naidoo & Coopoo 2007).

#### 3.5.3.3 *Section C*

This section dealt with the perceived influence of media on nurses' perception of body image. Questions 10 and 11 were based on a study by Grabe, Ward & Hyde (2008), who investigated the role of media in body image concerns amongst women.

#### 3.5.3.4 *Section D*

Question 12 dealt with the black women's perception of body image and which body shape/s they felt represented health, wealth, overweight, obesity, thinness, HIV, poverty, strength, weakness, ability to bear children and which body shapes were desired by their family, and by men in their culture. These questions were based on previous studies which have reported that black SA women consider being overweight as beautiful (Skaal & Pengpid 2011; Mvo *et al* 1999) and representative of strength, health, wealth and happiness (Puoane *et al* 2005b). Thinness, however, has been associated with hard times, poverty and HIV infection (Mvo *et al* 1999). The choice of the Stunkard FRS has been discussed and justified in Chapter 2.

#### 3.5.3.5 *Section E*

In this section, questions 13,14 and 17 were designed to determine whether family beliefs influenced the way the nurses felt about their body image. According to Puoane, Matwa, Bradley & Hughes (2006), society, families and communities played a large role in the determinants of weight. Questions 15 and 16 were designed to determine whether media is overpowering cultural beliefs. These questions were also essential to

investigate the possible factors causing the shift in attitudes amongst black SA females since it was observed that many of them were being influenced by media to lose weight.

#### 3.5.3.6 *Section F*

Questions 18 to 21 were designed to determine whether nurses had tried to reduce weight, the options they had used to do so and whether they were successful or not (Matoti-Mvalo & Puoane 2011; Prinsloo *et al* 2011). Question 22 was included to investigate factors that prevented nurses from being able to control their body weight, because it has been observed that adverse work schedules could lead to obesity amongst nurses (Shipra Gupta 2016; Phiri *et al* 2014; Han *et al* 2011).

#### 3.5.4 Data collection form

In this form, a code was assigned to each nurse and their name, age, ID and ward were recorded (Appendix A). The ward was included so that the researcher would know where to fetch the questionnaire from. The fasting criteria were asked to ensure that they met the requirements for the BIA. Their perceived current and desired body shapes were recorded on this form prior to the anthropometric measurements being taken. Anthropometric measurements, as well as the QuadScan code, were recorded on this form.

### 3.6 PILOT STUDIES

The first pilot study was conducted in Pietermaritzburg. A group of four black females and three black males (18 to 22 years old) who were waiting to catch the bus, were approached by the researcher and asked if they were willing to answer a few questions regarding obesity and cultural beliefs amongst black African women. The students were interviewed separately and were asked about their cultural beliefs regarding obesity, and about other factors that could possibly influence obesity amongst black women. The females were asked to choose their perceived actual body image and ideal body image on the Stunkard FRS. Black male students were interviewed since previous

studies have shown that in the black culture men prefer women who are overweight (Okop *et al* 2016; Mvo *et al* 1999). The males were therefore asked which body image they would prefer in their respective partners. Anthropometric measurements and BIA were not done on these students. This pilot study resulted in the modification of the questionnaire by including questions such as culture, job satisfaction and media.

For the second pilot study, one of the African staff at the Discipline of Dietetics and Human Nutrition was asked to take part in an additional pilot study and to recruit her friends. The aims and objectives were explained to them and eight women aged 25 to 60 years signed the informed consent form (Appendix C). Height and weight were taken using the described methodology. Bioelectrical impedance analysis was not done as the equipment was not available at the time. The data collection form (Appendix A) and the self-administered questionnaire (Appendix B) were piloted. This pilot study resulted in the modification of the questionnaire by including questions regarding family beliefs.

For the third pilot study, the head of Zimeleni Nursing School Mrs Thobile Shelmbe ([zimeleni@telkomsa.net](mailto:zimeleni@telkomsa.net)) was contacted by the researcher via a phone call and the aims and objectives of the study were explained to her. Thereafter, permission was granted to carry out this pilot study at the Zimeleni Nursing School (Appendix D). All the black female nurses, both students and staff, who were present, were invited to participate in the study. A group talk was given by the researcher who explained the aims, objectives and procedures and what was expected of them. Overall, 18 signed informed consent forms were collected. The nurses were instructed to not eat anything or drink any caffeinated drinks four hours prior to the tests, not to consume any alcoholic drinks 24 hours prior to the tests and not to do any exercise 12 hours prior to the tests. The next day, if compliant, they were weighed in minimal clothing and their height was taken using the mobile SECA stadiometer. Their BIA was measured using the QuadScan 4000 (Bodystat). Each nurse was given the questionnaire to fill and this was collected the following day by the researcher. Only nine questionnaires were received from Zimeleni Nursing School since many were absent the following day or forgot to bring their questionnaires. This pilot study resulted in the rewording of several questions from

the questionnaire due to feedback from the pilot study participants. No changes were necessary to the procedure to be followed.

Since very few questionnaires were returned, it was essential to re-pilot them. Hillcrest Aids Centre Trust and Le Domaine retirement village were contacted, and copies of the questionnaires were emailed to them after explaining the aims and objectives of this study. Mrs Jennifer Phumele Dlamini ([phumeleledlamini27@gmail.com](mailto:phumeleledlamini27@gmail.com)), a nursing manager, as well as her personal friends who were nurses also filled in the questionnaires. A total of 17 re-piloted questionnaires were collected. This final pilot study resulted in making the final changes to the questionnaire by restructuring and regrouping the questions.

### 3.7 MAIN STUDY

Permission to conduct the main study was obtained from the hospital manager, Mr Heinrich Venter ([customercarestaugustines@netcare.co.za](mailto:customercarestaugustines@netcare.co.za)) of St Augustine's Hospital (Appendix E). Ethics approval was obtained from the Biomedical Research Ethics Committee of UKZN (BREC) (Appendix F) and the Netcare Research Operations Committee (Appendix G). Thereafter, the main study was carried out at the hospital and data was collected over a period of six weeks (24<sup>th</sup> July 2017- 31<sup>st</sup> August 2017). The Human Resources department of the hospital supplied a list of all black female nurses employed.

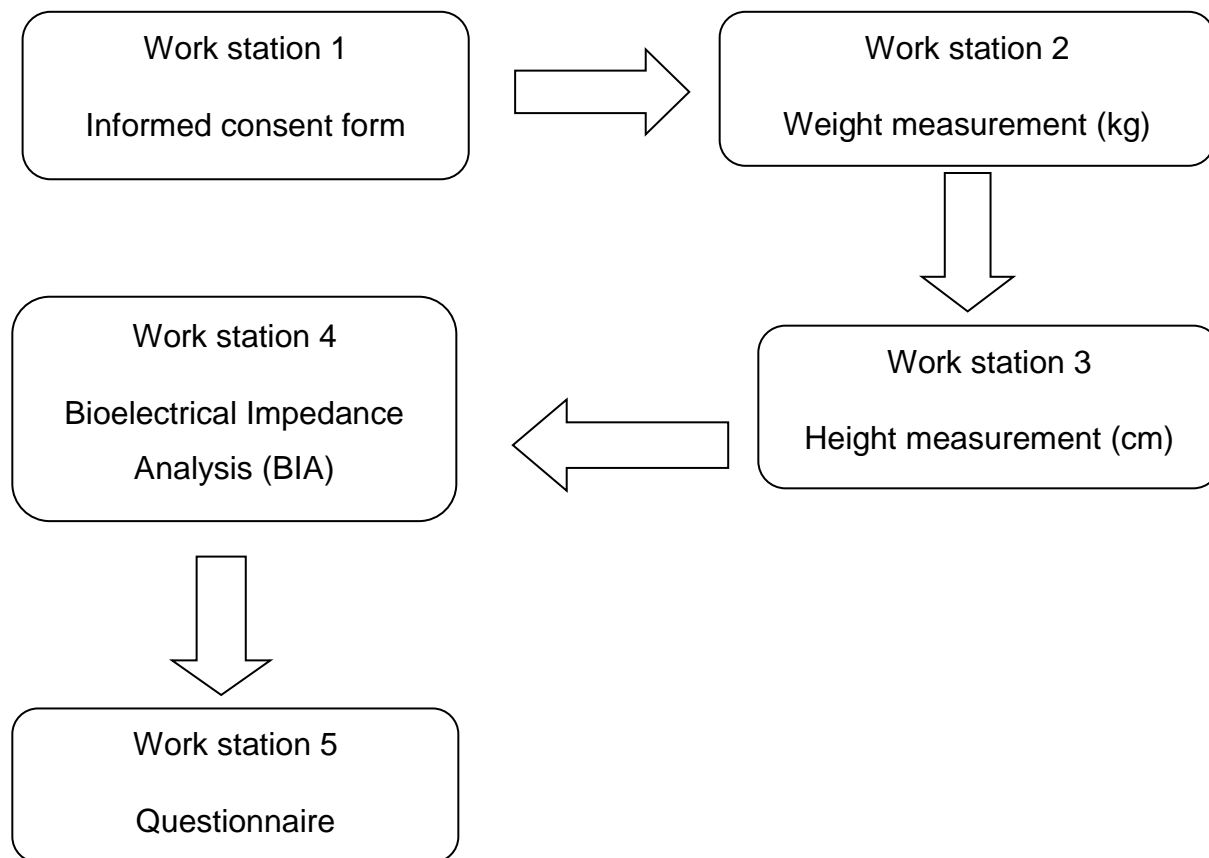
A management meeting was held between the Nursing Manager, Jenny Pieterse ([Jennifer.pieterse@netcare.co.za](mailto:Jennifer.pieterse@netcare.co.za)), the unit managers, the resident hospital dietician, Mandy Read ([readmandy@gmail.com](mailto:readmandy@gmail.com)) and the MSc supervisor, Dr Chara Biggs ([biggsc@ukzn.ac.za](mailto:biggsc@ukzn.ac.za)) to explain the aims and objectives as well as to discuss the logistics and feasibility of the study. All the unit managers agreed to allow the nurses from their respective units time off to participate in the study.

The researcher went to each ward and asked the unit manager for permission to speak with the black female nurses on duty. The researcher spoke with each black female nurse individually inviting them to participate and explained the inclusion criteria, aims



and objectives of the study. On the day of data collection, each nurse was greeted by the researcher in an available treatment room within the hospital. The nurse was asked if she had complied with the fasting and exercise criteria. If yes, she could participate on the same day and if no, she was asked to comply with the criteria for participation the following day.

The informed consent form (Appendix C) was explained thoroughly and once the researcher was satisfied that the nurse understood the purpose of the study and what was expected, they were then asked to sign the informed consent form. Their names and details were recorded by the researcher on the data collection form (Appendix A) and the nurse was asked to choose their perceived actual and desired body shape on the Stunkard FRS (Appendix A). All measurements were conducted in a private examination room. Nurses were then weighed in minimal clothing by removing their uniform and wearing a cotton gown over their undergarments and their inhaled height was taken using the mobile SECA stadiometer. They were then asked to take off any jewellery and lie down on the plinth with their arms extended from the chest by about 30° and legs separated by about 45°. For obese nurses, a non-conductive material (cotton bedsheet) was folded and placed between their legs. Their BIA was measured using the QuadScan 4000. Once all measurements were completed, the nurse was thanked for her participation and given the questionnaire (Appendix B) to fill in. The researcher collected the questionnaire later on the same day or on the following day. Once the questionnaires were collected, they were checked thoroughly by the researcher to ensure that they were correctly completed, and the nurses were given a lucky draw form to fill in. The lucky draw prize was R1000 per every 50 nurses. Figure 3.6 depicts the flow diagram of the main study.



**Figure 3.6:** A flow diagram depicting the procedure followed during the main study

All data was entered twice on two different Excel spreadsheets by the researcher and cross-checked for inconsistencies by the statistician. The data was then imported into the Statistical Package for Social Sciences (SPSS) version 24 and analysed by the statistician. The data file was password protected and was only accessible by the researcher.

### 3.8 STATISTICAL ANALYSIS

A p value of <0.05 was considered statistically significant. Descriptive analysis was used which included means and standard deviation (SD) as well as tables and graphs. Frequencies and percentages were represented in tables and graphs. Inferential analysis was used where tests were applied to look for significant relationships and

trends in the data. This included the Pearson’s correlation, Chi-square tests, ANOVA, paired sample t-test, one sample t-test, independent sample t-test and Binomial test. Pearson’s correlation coefficient was used to measure the linear relationship between the two interval variables. The Chi-square test of independence was used on cross-tabulations to determine whether there was a significant relationship between two nominal variables. Where conditions were not met, the Fisher’s exact test was used. ANOVA was used to test if a significant difference existed in mean values for a specific variable across another variable that had more than two categories. The one sample t-test was used to test whether a mean score was significantly different from a scalar value while, the paired samples t-test compared the means of two variables for a single group. The independent sample t-test was used to compare two independent groups of cases. The Binomial test was used to test whether a significant proportion of respondents selected one of a possible two responses, which could be extended when data with more than two response options is split into two distinct groups.

### 3.9 VARIABLES INCLUDED IN THE STUDY, DATA CAPTURING AND STATISTICAL ANALYSIS

Table 3.2 covers all the objectives and variables and statistical analysis used to achieve them.

Table 3.2: Variables included in the study, data capturing and statistical analysis.

Objective	Variable (s)	Statistical analysis
1. To determine the prevalence of overweight and obesity.	Weight (kg), height (m)	Descriptive statistics in the form of means and standard deviations  Chi-square goodness-of-fit test was used to test if any category (ies) of BMI occurred

significantly more than others.

2. To determine body fat percentage and FFM.	Body fat percentage	Descriptive statistics in the form of means and standard deviations  Pearson's Correlation coefficient
3. To determine how they perceived their body image.	Stunkard FRS	Paired samples t-test was used to determine if there was a significant difference in actual and perceived body shape.
4. To determine whether they were satisfied with their body shape.	Stunkard FRS  Questionnaire	Paired samples t-test  ANOVA  Pearson's Correlation coefficient
5. To determine whether their cultural beliefs influenced their body image perception.	Questionnaire	One sample t-test  Chi-square test of independence  Fisher's Exact test  Independent samples t-test
6. To determine whether they were influenced by media to lose weight and whether the influence of media overpowered their cultural beliefs.	Questionnaire	Descriptive statistics in the form of means and standard deviations  One sample t-test  ANOVA

		Pearson's coefficient	Correlation
7. To determine whether family beliefs influenced the way they felt about their body image.	Questionnaire	Descriptive statistics in the form of means and standard deviations	
		One sample t-test	
		Pearson's coefficient	Correlation
8. To determine which factors were barriers to body weight control.	Questionnaire	One sample t-test	

### 3.10 REDUCTION OF BIAS

For the purpose of this study, the reduction of bias was explained with regards to the anthropometric and BIA measurements, and the questionnaire.

#### 3.10.1 Anthropometry

The researcher strictly adhered to the definitions of height and weight and was trained in anthropometric measurements by the supervisor Dr C Biggs, who was trained in the International Society for the Advancement of Kinanthropometry (ISAK) to decrease bias. Although the researcher had training in anthropometry as part of the BSc Dietetics and Postgraduate Diploma in Dietetics, this training was to ensure standardization. The same equipment was used for all the nurses throughout data collection. Body weight was measured to the nearest 0.1 kg using a digital scale and inhaled height was measure to the nearest 0.1 cm using a portable stadiometer. Measurements were taken twice, and the mean value was used. If the measurements differed by more than

0.01 kg or 0.1 cm, the measurements were done for a third time and the two closest values were used.

### 3.10.2 Bioelectrical impedance analysis

The researcher was trained to use the QuadScan 4000 (Bodystat) by the supervisor, Dr Chara Biggs. All standard operating procedures were adhered to. Measurements were taken twice, and the mean was used.

### 3.10.3 Questionnaire

Each nurse was advised to fill in their questionnaire on their own since it contained very confidential information. Some nurses chose to fill in their questionnaires in the presence of the researcher.

## 3.11 RELIABILITY AND VALIDITY

Reliability is defined as the extent to which results are accurate and consistent over a period of time (Nahid 2003). Validity is measured by determining whether the researcher is truly measuring that which was intended to be measured in the study, and/or how constant the results are (Nahid 2003).

The precision scale (AND UC-321, A&D Medical) with a capacity of 150 kg was calibrated with a known weight daily (5 kg Avery). The QuadScan 4000 was calibrated daily using a calibrator according to standard operating procedures. Calibration ensured reliability of the results collected. Each measurement was taken twice to ensure reliability and validity. The questionnaire used in this study was based on previous studies that investigated body image perception amongst black women in SA as well as prevalence of obesity amongst nurses in SA. The Stunkard FRS was validated and adapted for use in SA by Mciza *et al* (2005).

### 3.12 ETHICAL CONSIDERATIONS

Ethical approval was obtained from BREC UKZN (BE 286/97) and the Netcare Research Operations Committee (UNIV-2017-0026). Permission was obtained from St Augustine's Hospital manager and Zimeleni Nursing School manager. Prior to data collection, each nurse signed an informed consent form after being thoroughly informed of the procedures and what was expected of them. Data collected from each nurse was kept confidential as none of the other nurses had any access to the data. Each nurse was allocated an anonymous code and the data was entered into SPSS version 24 using those codes. Only the researcher had access to the data collected which was password protected. All questionnaires and data collection forms were kept in a locked cupboard and will be kept for a period of five years before being destroyed.

## CHAPTER 4: RESULTS

### 4.1 INTRODUCTION

This chapter presents the results of the study according to the objectives outlined in Chapter 1. This section focuses on the prevalence of overweight and obesity, body fat percentage, FFM, body image perception, body image dissatisfaction and factors influencing those perceptions such as cultural beliefs, media, family beliefs amongst the nurses as well as factors that are barriers to body weight control amongst them.

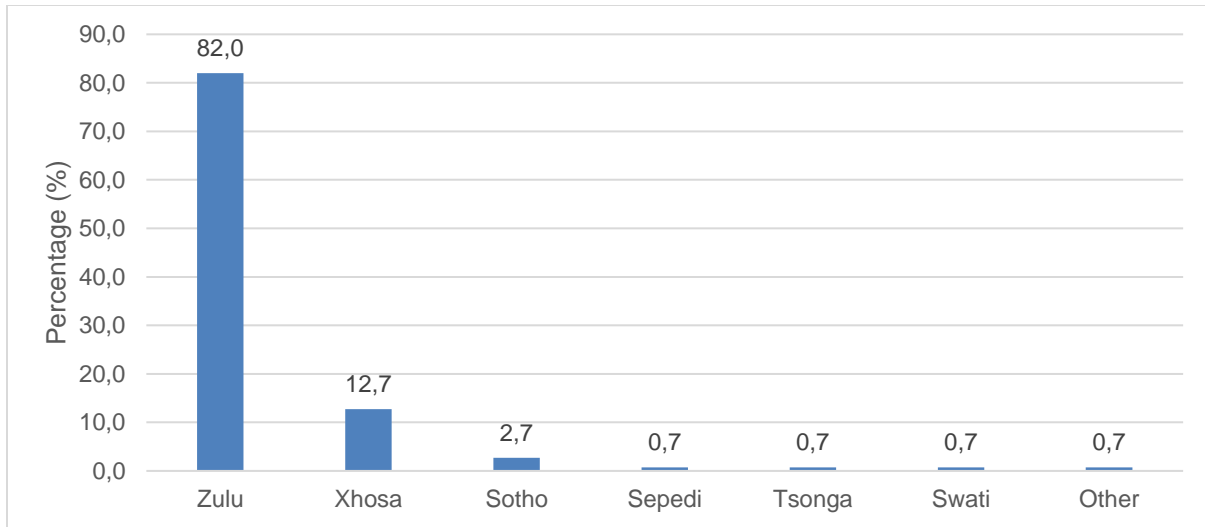
### 4.2 SAMPLE SIZE

A total of 225 nurses were invited to participate. The sample comprised of 152 black female nursing staff. Seventy-three refused to participate as half (50.7%, 37/73) felt that the study was racial as it was directed at black nursing staff, some were too busy to leave their wards (28.8%, 21/73), some said they would not be able to comply with the fasting criteria (11.0%, 8/73), while others were pregnant (9.6%, 7/73). The response rate was 67.6%. Two nurses did not return their questionnaires.

### 4.3 SOCIO-DEMOGRAPHIC STATUS

The mean age was 34 years (SD  $\pm$  8.4, range 21-66 years) and the mean nursing experience was 6 years (SD  $\pm$  5.6, range 0.2-40 years). Just over half (56.0%, 84/150) grew up in a rural area, 34.0% in an urban area (51/150) and 10.0% in a suburban area (15/152). Most were of the Zulu culture (82.0%, 123/150) (Figure 4.1).

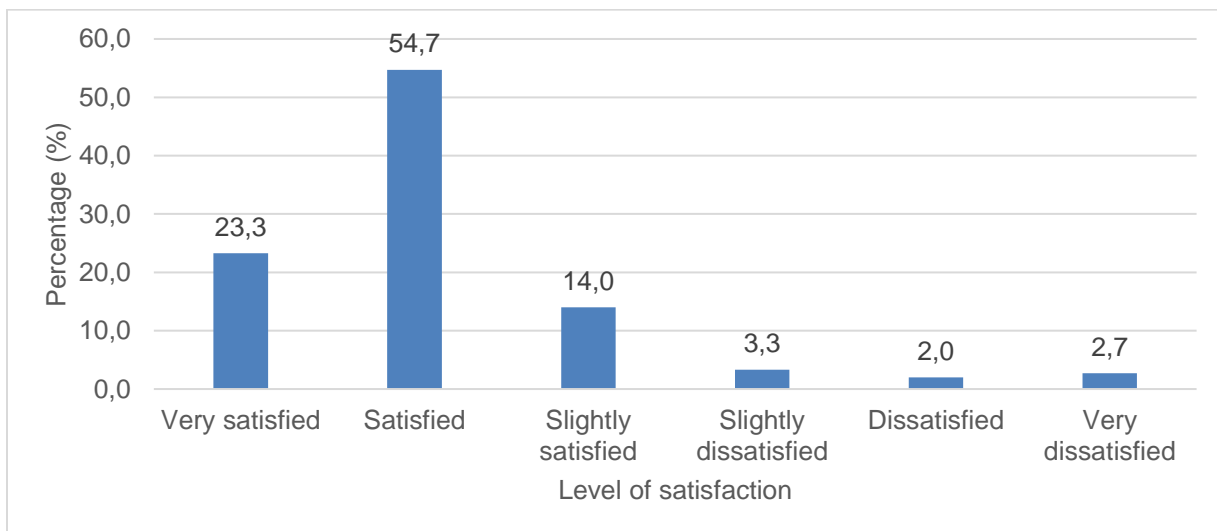




**Figure 4.1:** Culture of the nurses

#### 4.4 CAREER CHOICE SATISFACTION

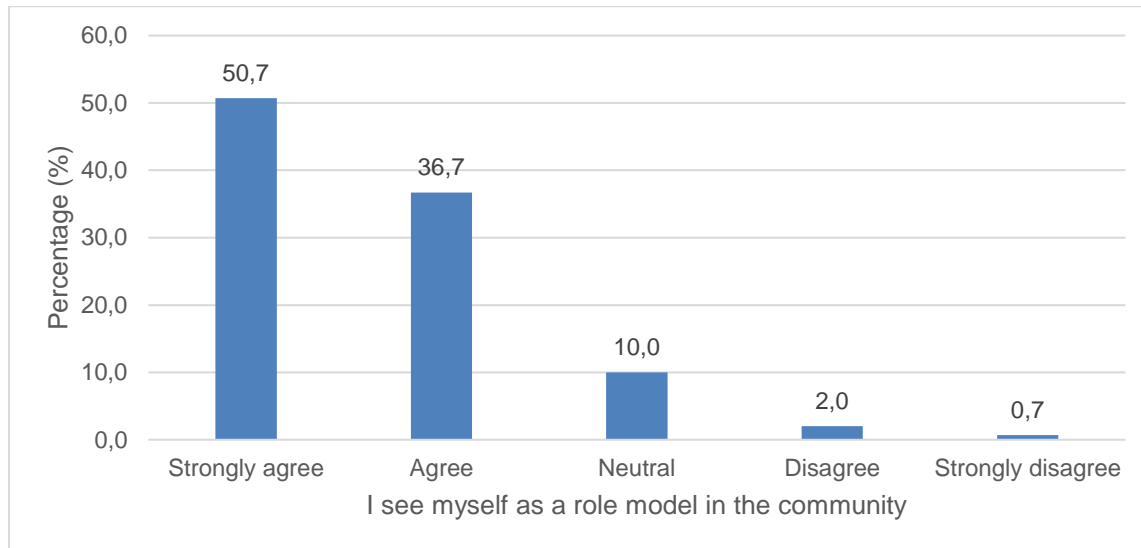
Regarding current career choice, many (78.0%, 117/150) were satisfied (54.7%, 82/150) or very satisfied (23.3%, 35/150) versus the few (4.7%, 7/150), who were dissatisfied (2.0%, 3/150) or very dissatisfied (2.7%, 4/150) (Figure 4.2). The One-sample t-test demonstrated significant satisfaction ( $M=4.86$ ,  $SD=1.0$ ) regarding career choice, [ $t(149) = 15.874$ ,  $p < 0.0005$ ].



**Figure 4.2:** Nurses' satisfaction level regarding their current career choice

#### 4.5 NURSES AS ROLE MODELS

Most (87.3%, 131/150) either felt strongly (50.7%, 76/150) or agreed (36.7%, 55/150) that they regarded themselves as role models in the community (Figure 4.3).



**Figure 4.3:** Nurses' perception of themselves as a role model in the community

The one sample t-test analysis resulted in significant agreement ( $M= 4.35$ ,  $SD \pm 0.8$ ) that nurses saw themselves as a role model in the community,  $t(149) = 20.768$ ;  $p < 0.0005$ .

#### 4.6 MEDICAL CONDITIONS

Many (74.0%, 111/150) stated that they had no medical conditions. Very few (4.7%, 7/150) listed HIV/AIDS. The only NCDs were high blood pressure (4.0%, 6/150), asthma (3.3%, 5/150) and diabetes mellitus (1.3%, 2/150). Polycystic ovarian syndrome (PCOS) (0.7%, 1/150), hypothyroidism (0.7%, 1/150) and insulin resistance (0.7%, 1/150) were listed and are known to cause weight gain (Table 4.1).

Table 4.1: Medical conditions as listed by the nurses (n=44)

<b>Medical condition</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>
HIV/AIDS	7	4.7
High blood pressure	6	4.0
Asthma	5	3.3
Allergies	4	2.7
Anaemia	3	2.0
Sinusitis	3	2.0
Diabetes Mellitus	2	1.3
Rhinitis	2	1.3
Arthritis	1	0.7
Barlow's Syndrome	1	0.7
Blood clotting	1	0.7
Eczema	1	0.7
Feet pain	1	0.7
Hypoglycaemia	1	0.7
Increased intracranial pressure	1	0.7
Mitral valve replacement	1	0.7
Ovarian cyst	1	0.7
Polycystic Ovarian Syndrome (PCOS)	1	0.7

Insulin Resistance	1	0.7
Hypothyroidism	1	0.7

#### 4.7 MEDICATIONS

Only 19.3% (29/150) were on medication which could cause weight gain. The most common medication taken were contraceptives (19.3%, 29/150) (Table 4.2). Of these, 16.7% (25/150) were taking contraceptives causing weight gain: Depo Prevara (8.0%, 12/150) (Espey, Steinhart, Ogburn & Qualls 2000), Diane 35 (1.3%, 2/150) (NPS MedicineWise 2017), Marvelon 150 (0.7%, 1/150) (NPS MedicineWise 2017), Nexplanon (1.3%, 2/150) (WebMD 2017a), Yasmin (2.7%, 4/150) (WebMD 2017a), Nur-Isterate (2.0%, 3/150) (South African Electronic Package Inserts 2005) and Nustrate (0.7%, 1/150) (NHS 2015). The only anti-histamine being taken by the nurses that causes weight gain was Texa since it causes an increase in appetite according to the package insert (1.3%, 2/150) (Pharma Dynamics 2005). Amongst the antiretroviral drugs being taken, Atripla is the only one that causes weight gain (0.7%, 1/150) (WebMD 2017a). Prednisone, an anti-inflammatory, has been observed to cause weight gain as it increases appetite (0.7%, 1/150) (NPS MedicineWise 2017).

Table 4.2: Medications most commonly taken by the nurses

Medications	Frequency (n)	Percentage (%)
Contraception (pill, injection, patch) -  (Depo Prevara, Diane 35, Diva 35, Evra patch, Marvelon 150, Nexplanon, Yasmin, Nur-Isterate, Nustrate)	29	19.3
Anti-hypertensive -  (Adco Dapamax, Amloc, Spiractin, Pur Bloka, Zartan Co, Adalat XI, Ziak, Exforge)	6	4.0

Anti-histamines - (Allergex, Texa, Allecet)	6	4.0
Inhalers - (Asthavent, Budeflam, Seroflo)	5	3.3
Antiretroviral drugs - (Tenofovir, Tribuss, Atripla, Atroiza)	5	3.3
Diabetes medication - (Metformin, Glucophage Xr)	4	2.7
Anti-inflammatory - (Loxiflam, Prednisone)	2	1.3

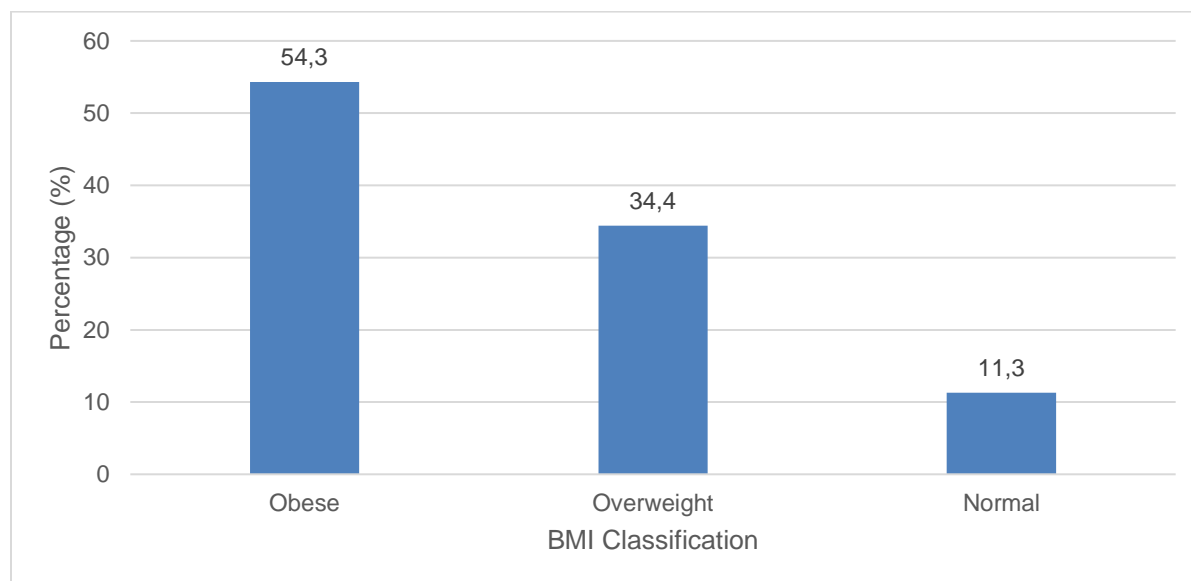
#### 4.8 PREVALENCE OF OVERWEIGHT AND OBESITY

The mean BMI was 32.1 kg/m<sup>2</sup> (SD ± 7.0, range 18.9-54.2 kg/m<sup>2</sup>). None (0%, 0/151) were underweight, 11.3% (17/151) were of normal weight and the rest were either overweight (34.4%, 52/151) or obese (54.3%, 82/151) (Table 4.3, Figure 4.4). There were no significant differences in BMI classifications and the area they grew up in, but the ANOVA test demonstrated a significant difference between BMI classifications and age. Those who were obese class II and III were significantly older  $F(4,146) = 3.583$ ,  $p=0.008$ .

Table 4.3: Classification of BMI amongst the nurses (WHO 2006)

BMI Classification/(kg/m <sup>2</sup> )	Frequency (n)	Percentage (%)
Normal (18.5-24.9)	17	11.3
Overweight (25.0-29.9)	52	34.4
Obese Class I (30.0-34.9)	36	23.8

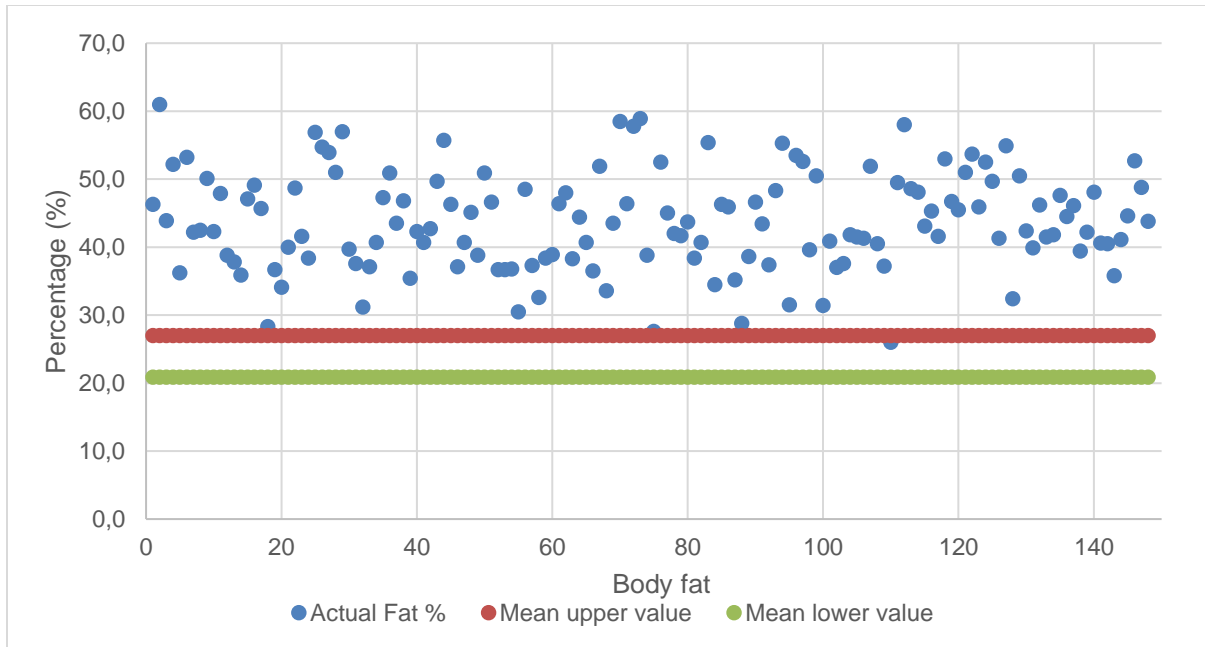
Obese Class II (35.0-39.9)	25	16.6
Obese Class III (>40.0)	21	13.9



**Figure 4.4:** Prevalence of overweight and obesity amongst the nurses

#### 4.9 BODY COMPOSITION

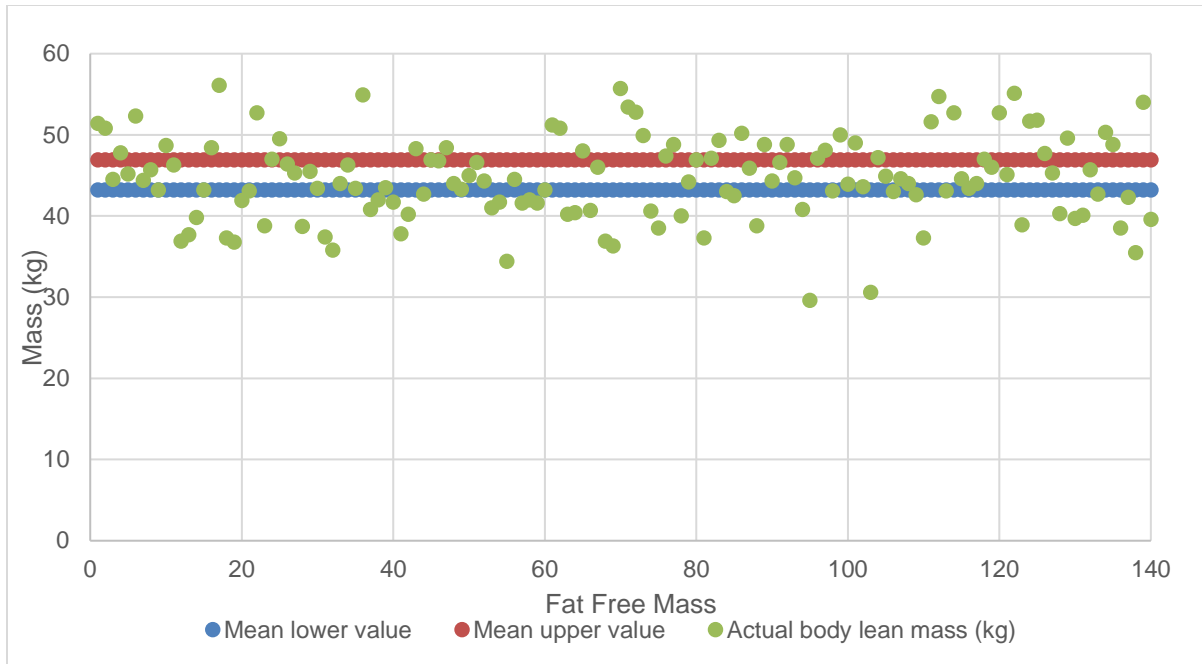
The mean body fat percent of 43.8% (SD  $\pm$  7.2, range 26.0-61.0%), was significantly higher than the mean normal range (20.9-27.0%), as shown in Figure 4.5. The mean body fat of 36.8 kg (SD  $\pm$  13.8, range 13.1-79.4 kg) was significantly higher than the normal body fat reference range (12.4-16.0 kg).



**Figure 4.5:** Actual body fat percentage of the nurses versus the normal body fat reference range

The Pearson correlation coefficient demonstrated significant positive correlations between body fat percent and age ( $r=0.446$ ,  $p<0.0005$ ), experience ( $r=0.310$ ,  $p=<0.0005$ ) and being a role model ( $r=0.237$ ,  $p=0.004$ ). The older nurses, with more experience and those who felt they were role models had a higher body fat percent.

The mean FFM percent of 56.2% (SD  $\pm$  7.2, range 39.0-74.0%) was significantly lower than the mean normal range (73.0-79.1%). The mean FFM however was 44.6 kg (SD  $\pm$  5.1, range 29.6-56.1) which fell in the normal reference range (43.2-46.9 kg) as shown in Figure 4.6. Although the mean FFM was in the normal reference range, almost a third (32.0%, 47/147) needed to increase their FFM.



**Figure 4.6:** Actual fat free mass (kg) of the nurses versus the normal reference range

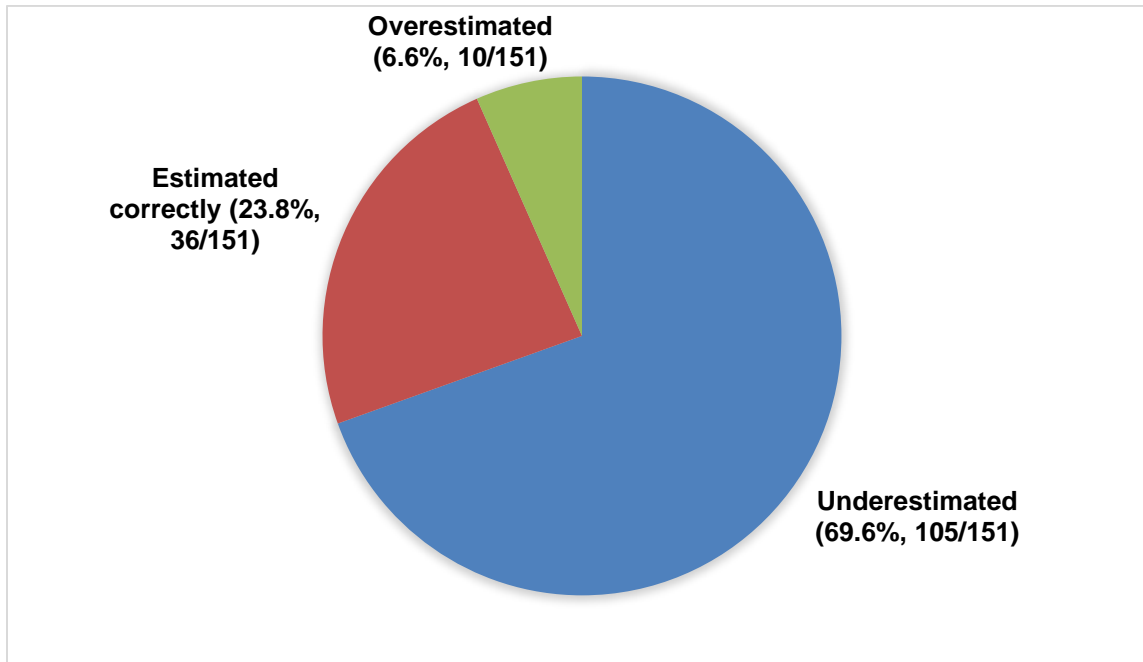
The Pearson’s correlation coefficient demonstrated a significant positive correlation between FFM (kg) and career choice satisfaction ( $r=0.175$ ,  $p=0.035$ ). A higher FFM therefore was associated with greater career choice satisfaction.

#### 4.10 BODY IMAGE PERCEPTION

Only 23.8% (36/151) correctly selected the shape that represented their BMI, while many underestimated their body shape (69.6 %, 105/151) (Figure 4.7), believing they were thinner than they actually were. The Paired samples t-test showed that there was a significant difference between actual and perceived body shape,  $t(150) = -11.697$ ,  $p < 0.0005$  and also demonstrated a significant difference between their actual mean BMI (obese class I,  $32.1 \text{ kg/m}^2$ ,  $SD \pm 7.0$ ) and their perceived mean BMI (overweight,  $28.2 \text{ kg/m}^2$ ,  $SD \pm 5.6$ ),  $t(150) = 11.085$ ,  $p < 0.0005$ . The Pearson’s correlation coefficient demonstrated that larger values of BMI difference were positively associated with higher age ( $r=0.292$ ,  $p < 0.0005$ ) and more experience ( $r=0.177$ ,  $p=0.032$ ). The older and more experienced nurses therefore were more likely to underestimate their body shape. The ANOVA test showed no significant difference in body image perception relating to

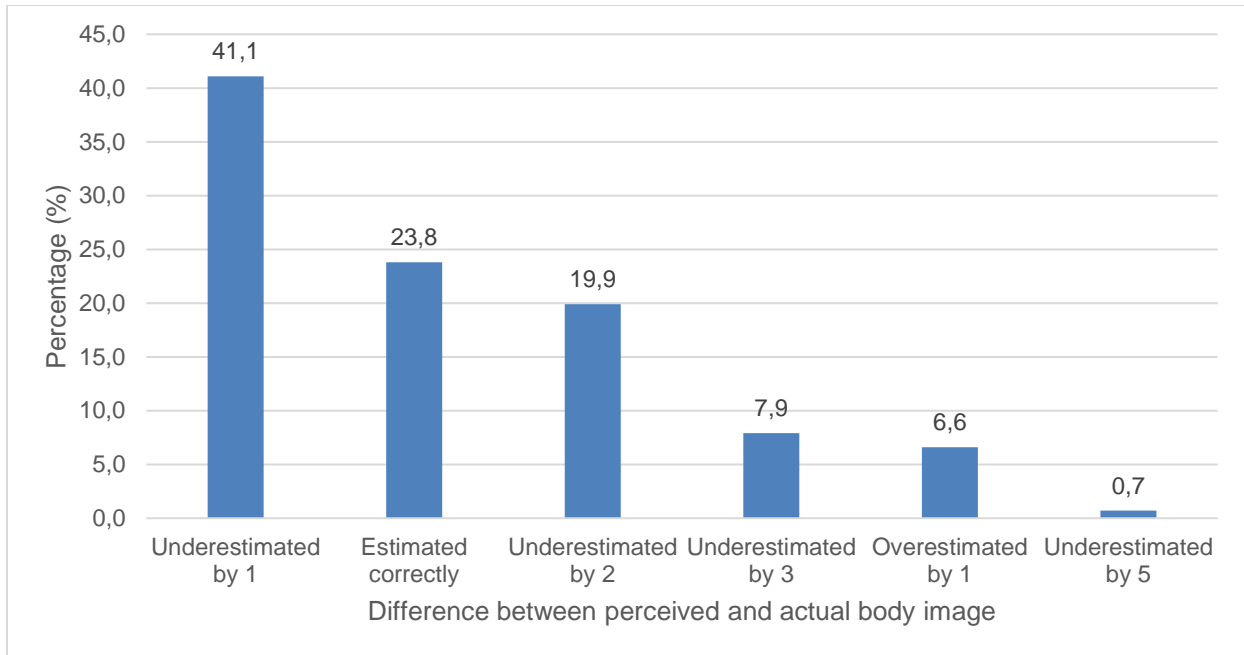


culture and the area they were raised in. Pearson's correlation coefficient showed no significant difference in body image perception and career satisfaction or being a role model in the community



**Figure 4.7:** Actual body image versus perceived body image

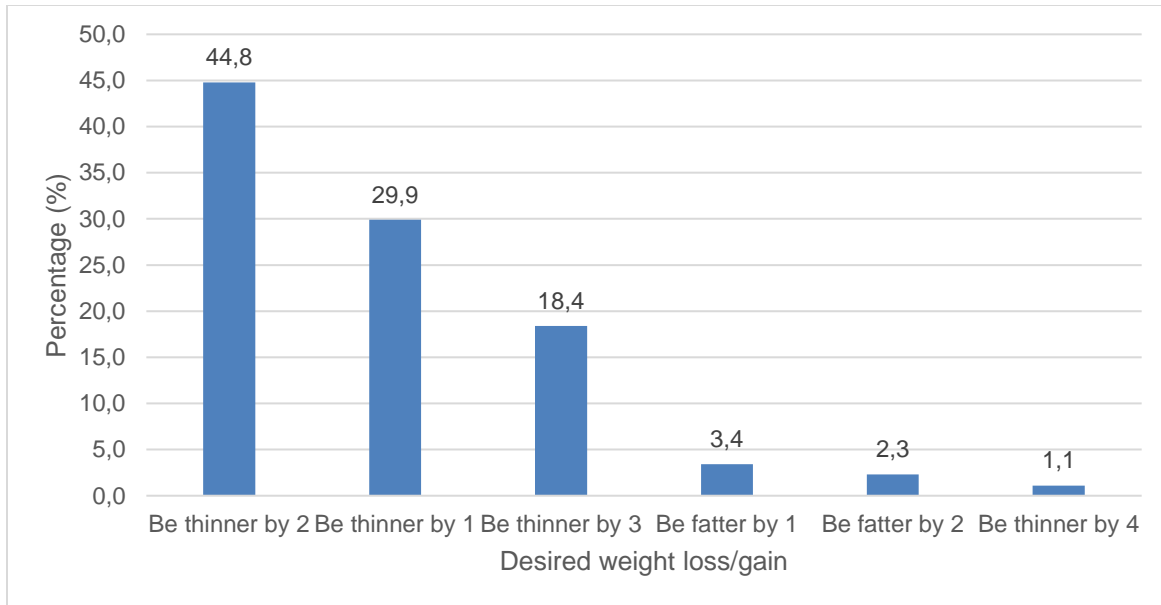
Many (69.6%, 105/151) underestimated their body image by one (41.1%, 62/151) or two shapes (19.9%, 30/151). The few who overestimated their body image, did so by one shape (6.6%, 10/151) (Figure 4.8).



**Figure 4.8:** The discrepancy between actual and perceived body image shapes

#### 4.11 BODY IMAGE SATISFACTION

Only 43.0% (65/151) were happy with their current shape. The Paired samples t-test demonstrated a significant desire ( $M=4.30$ ,  $SD \pm 1.0$ ) to lose weight,  $t(86) = 14.979$ ,  $p < 0.0005$ . Of those who wanted to be a different shape (57.0%, 86/151), most (94.3%, 81/86) wanted to lose weight and be thinner by either one (29.9%, 26/86), or two (44.8%, 39/86) shapes (Figure 4.9). Of the few (5.7%, 5/86) who wanted to gain weight, 2.3% (2/86) were overweight, while the remaining 3.4% (3/86) were of normal weight.



**Figure 4.9:** Desired weight loss or weight gain.

The ANOVA test showed no significant differences across the area they grew up in and body image satisfaction. The Pearson's correlation coefficient demonstrated no significant differences between age, experience, career satisfaction, being a role model and body image satisfaction.

#### 4.12 CULTURAL BELIEFS AND BODY SHAPE

For this section, the nurses could select more than one body shape from the FRS corresponding to the questions (Figure 4.10).

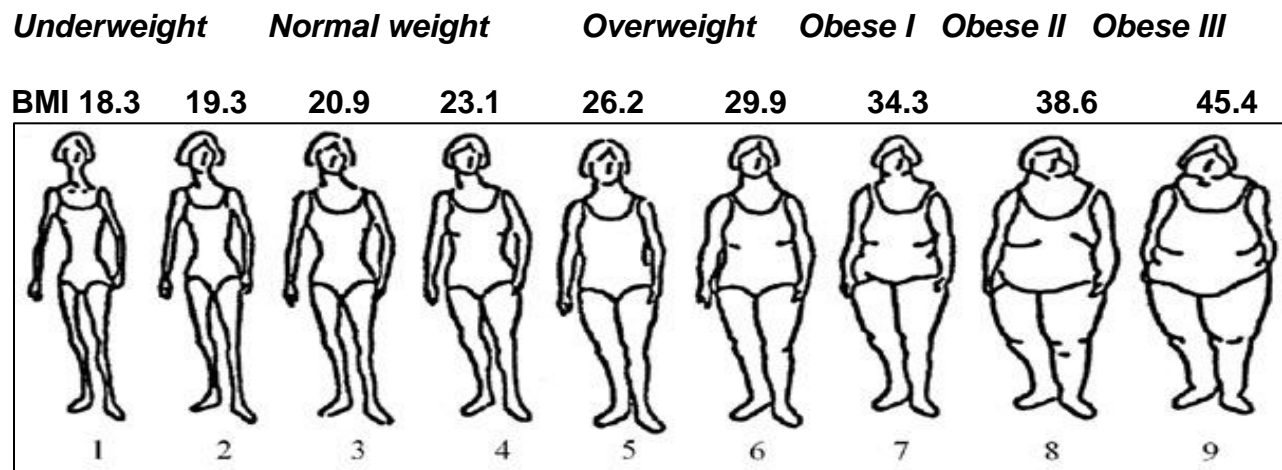


Figure 4.10: The Stunkard FRS with associated BMI for each shape (Stunkard *et al* 1983).

#### 4.12.1 The most healthy

To represent the most healthy body shape, most (90.1%, 135/150) correctly chose shapes representative of a normal body weight/BMI (two, three and four) (Figure 4.11) and could therefore identify a healthy body weight. Some (23.7%, 36/150) chose shape five which represents overweight. The Fisher’s exact test demonstrated no significant relationships across culture, area they grew up in or age.

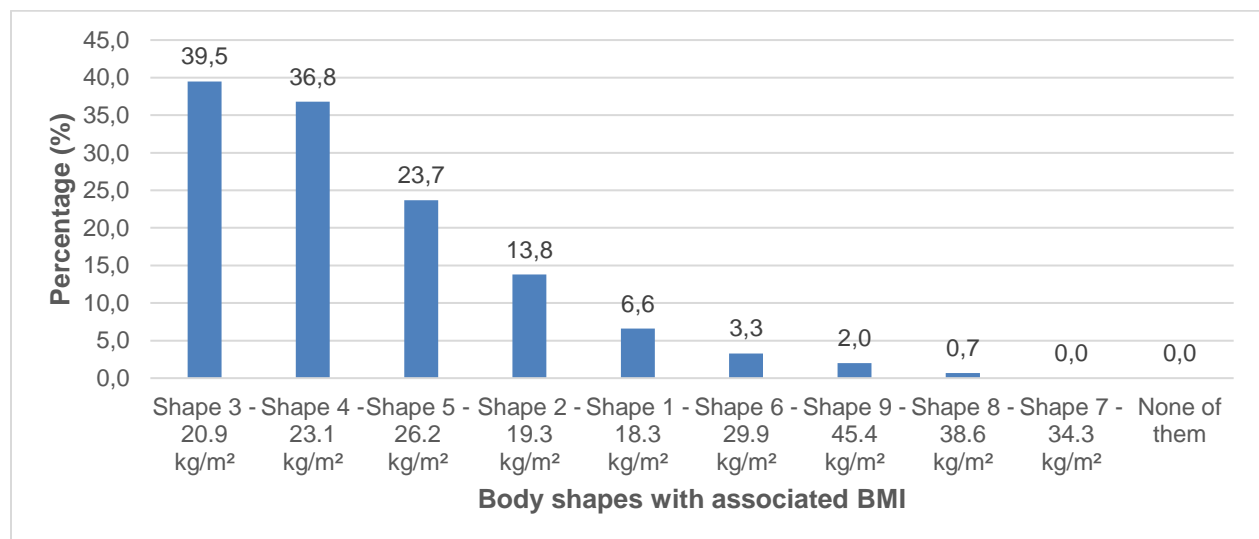
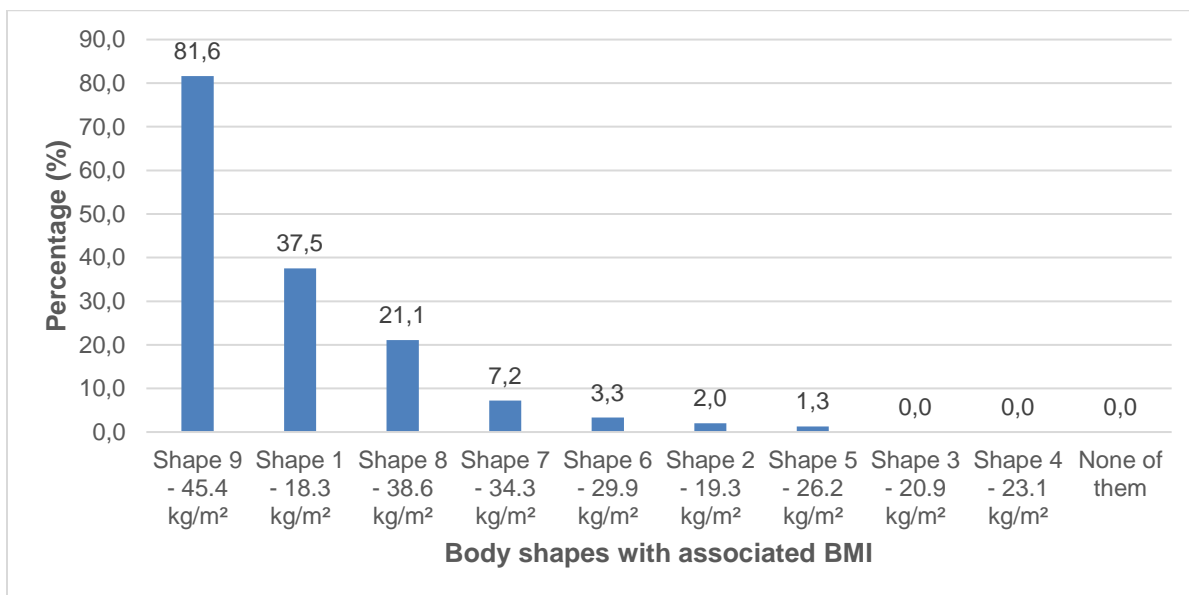


Figure 4.11: The nurses’ perceptions of the most healthy body shapes

#### 4.12.2 The most unhealthy

Many (81.6%, 122/150) correctly chose obese class III/shape nine and others obese class II/shape eight (21.1%, 32/150). Others (37.5%, 56/150) appropriately chose underweight/shape one (Figure 4.12). No significant relationships were noted across culture or age, but the Fisher's exact test demonstrated a significant relationship between the area they grew up in and selecting thin/normal weight shape two for the most unhealthy. A significant number of the nurses from urban areas selected shape two, ( $p=0.012$ ).

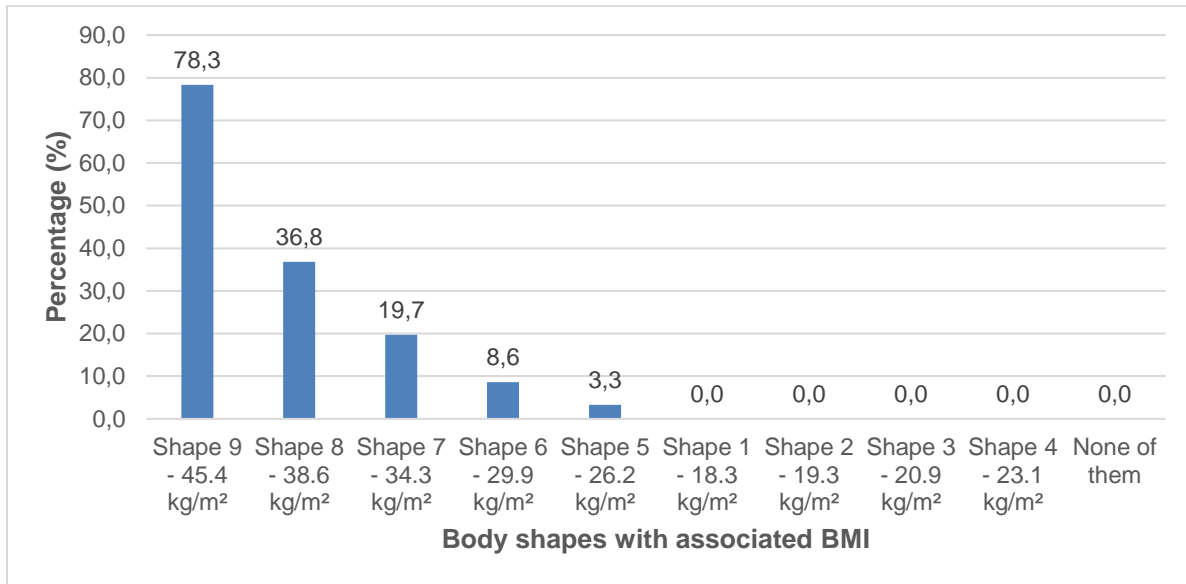


**Figure 4.12:** The nurses' perceptions of the most unhealthy body shapes

#### 4.12.3 Overweight

Only 11.9% (18/150) correctly chose shapes five and six. Many chose obese class III/shape nine (78.3%, 117/150) followed by obese class II/shape eight (36.8%, 55/150), (Figure 4.13). A Chi-square test of independence demonstrated a significant relationship between culture and the selection of shape five for overweight. A significant number of Xhosa nurses selected shape five and therefore had a more accurate perception of which shape was overweight, ( $p=0.17$ ). No relationship was noted regarding age, but the Fisher's exact test demonstrated a significant relationship

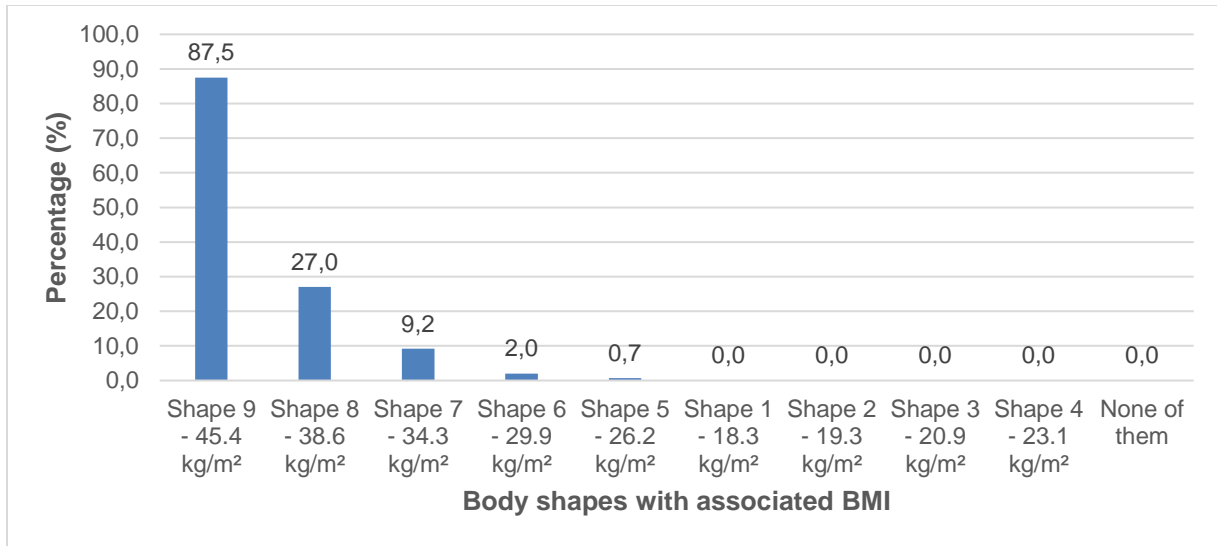
between area and selecting shape seven for overweight. A significant number from the suburban area correctly chose this shape ( $p=0.030$ ).



**Figure 4.13:** The nurses' perceptions of overweight body shapes

#### 4.12.4 Obese

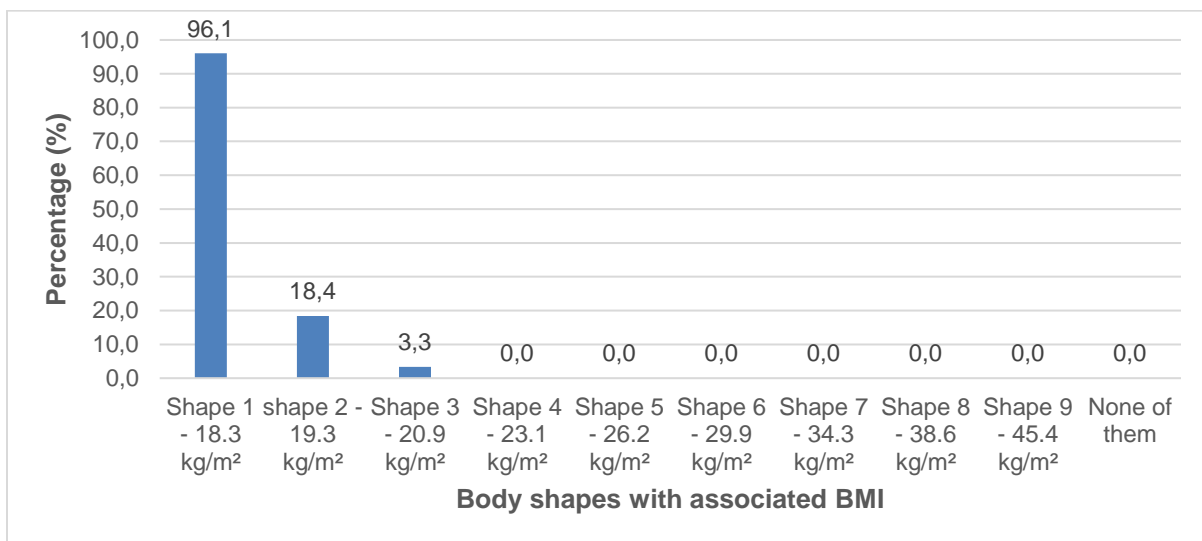
Many (87.5%, 131/150) correctly chose obese class III/shape nine followed by obese class II/shape eight (27.0%, 41/150) and obese class I/shape seven (9.2%, 13/150), as shown in Figure 4.14. Most could correctly identify obesity but did not seem to be able to distinguish between overweight and obesity. No relationship was noted across age and culture, but the Fisher's exact test demonstrated a significant relationship between area and selecting shape six as obese. A significant number from the suburban area selected this shape, ( $p=0.044$ ).



**Figure 4.14:** The nurses' perceptions of obese body shapes

#### 4.12.5 Thin

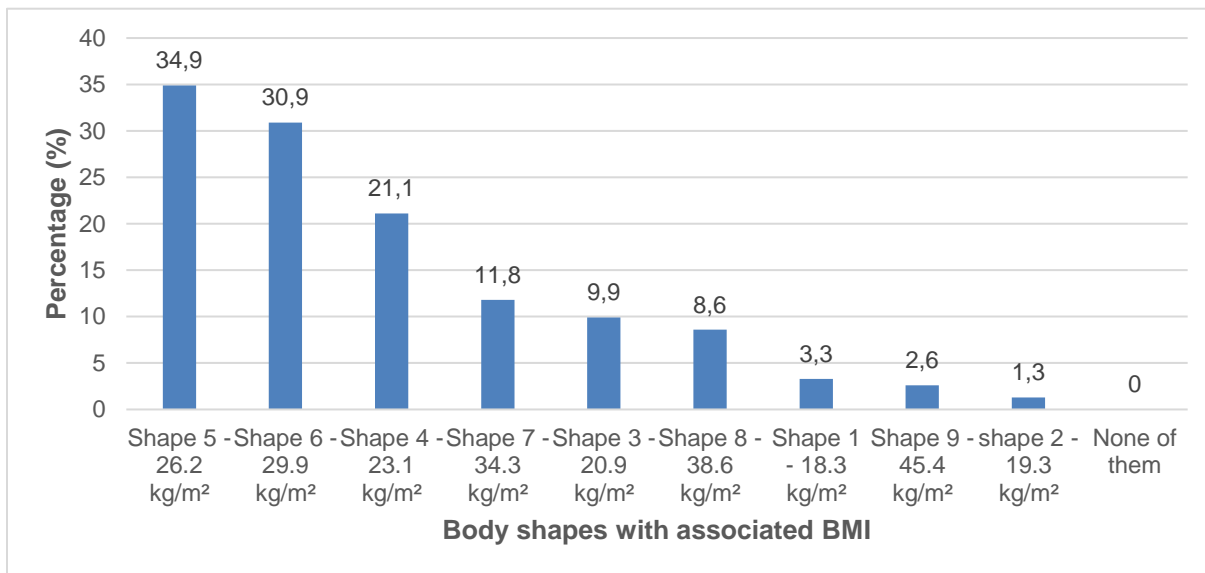
Many correctly chose underweight/shape one (96.1%, 144/150) and normal weight/shape two (18.4%, 28/150) (Figure 4.15), to identify thinness. Shape two is the thinnest in the normal BMI category. There were no significant relationships regarding age and culture, but the Fisher's exact test demonstrated a significant relationship across suburban area and selecting shape three as thin ( $p=0.023$ ).



**Figure 4.15:** The nurses' perceptions of thin body shapes

#### 4.12.6 The most desirable in your culture

The most common shapes selected were overweight/shape five (34.9%, 52/150) and overweight/shape six (30.9%, 46/150) (Figure 4.16). Only 32.2% (48/150) chose shapes representing a normal weight. Twenty-three percent chose the obese shapes (35/150). There were no significant relationships across culture and age, but the Fisher's exact test demonstrated a significant relationship between the suburban area and selecting shape nine/obese class III as most culturally desirable, ( $p=0.018$ ).

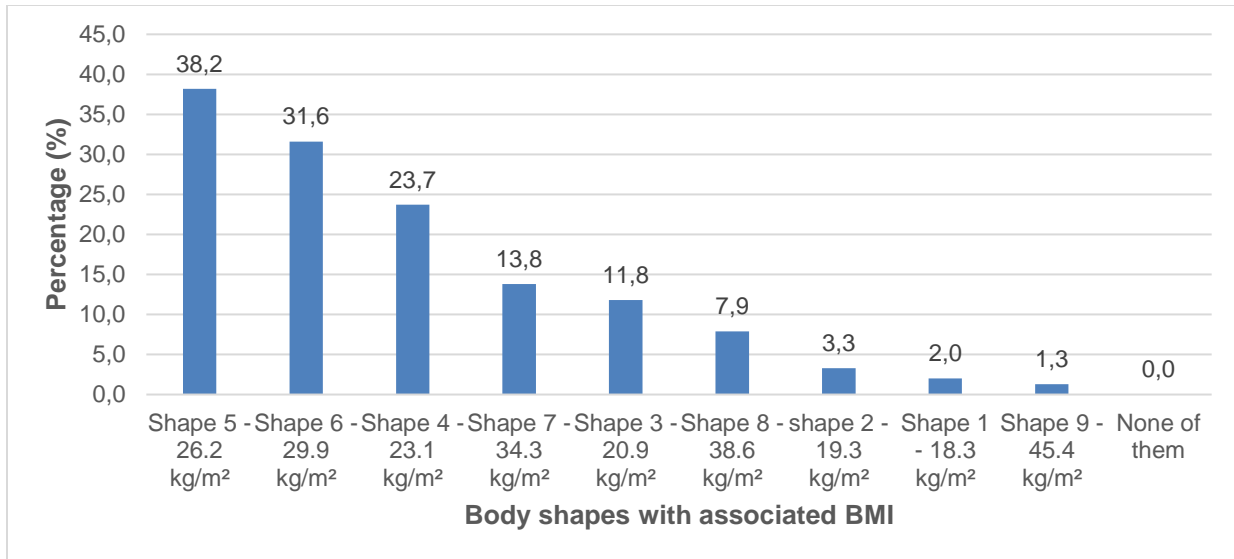


**Figure 4.16:** The nurses' perceptions of most culturally desirable body shapes

#### 4.12.7 Most preferred by men in my culture

The most preferred shapes were overweight/shape five (38.2%, 57/150) and overweight/shape six (31.6%, 47/150) (Figure 4.17). Over a third (38.8%, 58/150) selected normal shapes two, three and four while 23.0% (35/150) chose obese shapes seven, eight and nine. The Independent samples t-test demonstrated a significant relationship between age and shape two,  $t(6.609) = -3.336$ ,  $p=0.014$  and the Chi-square test of independence demonstrated that a significant number of Xhosa nurses selected shape two,  $p=0.17$ . A thin or normal body weight was more likely to be preferred by men (15.8%, 3/19) who were Xhosa.

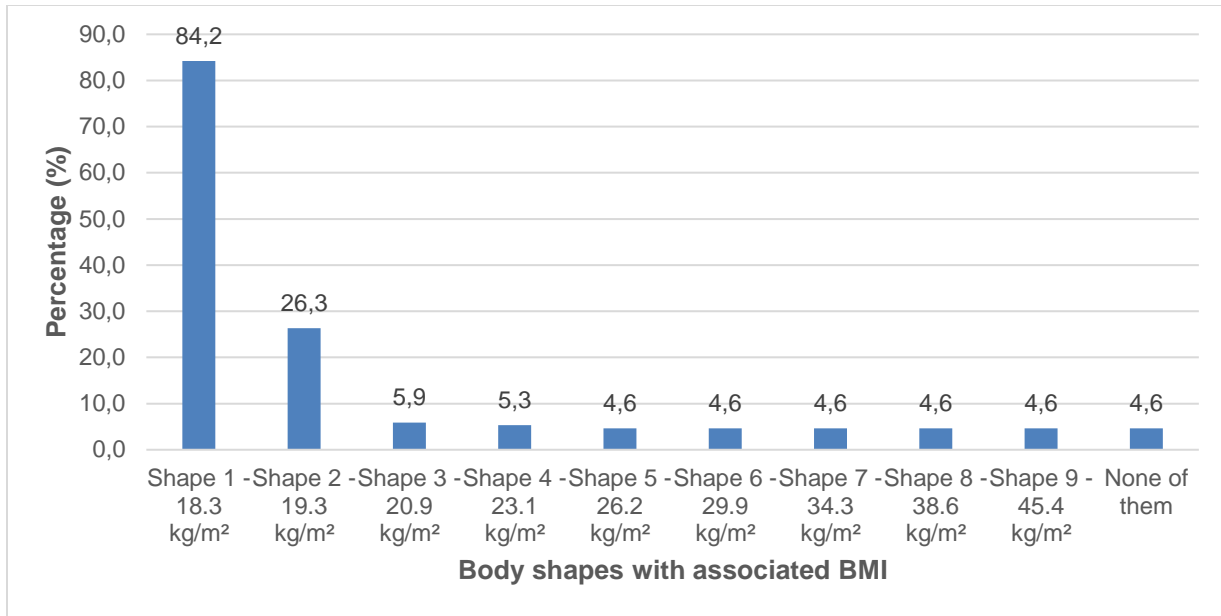




**Figure 4.17:** The nurses' perceptions of most preferred body shapes by men in their culture

#### 4.12.8 Associated with human immunodeficiency virus/acquired immunodeficiency syndrome and tuberculosis

Most associated underweight/shape one (84.2%, 126/150) and thin/normal weight/shape two (26.3%, 40/150) with HIV/AIDS and TB. A few (11.2%, 17/150) chose normal weight/shapes three and four, while 9.2% (14/150) chose overweight/shapes five and six and 13.8% (21/150) chose obese/shapes seven, eight and nine (Figure 4.18). According to 4.6% (7/150), a woman could be any size and still be infected with HIV/AIDS.

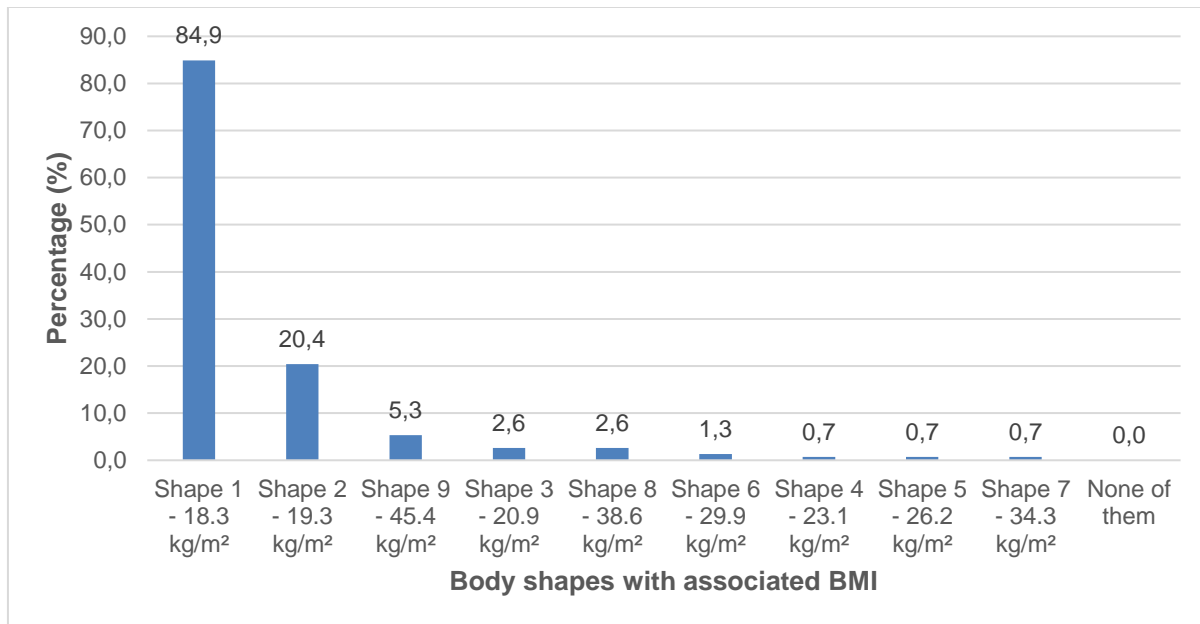


**Figure 4.18:** The nurses' perceptions of HIV/AIDS and TB infected body shapes

#### 4.12.9 Associated with being weak

Most (105.3%, 158/150)<sup>8</sup> associated weakness with underweight/shape one and normal weight/shape two (Figure 4.19). Obese class III/shape nine was chosen by 5.3% (8/150) since they believed that being obese could cause a person to be weak due to the weight on the legs.

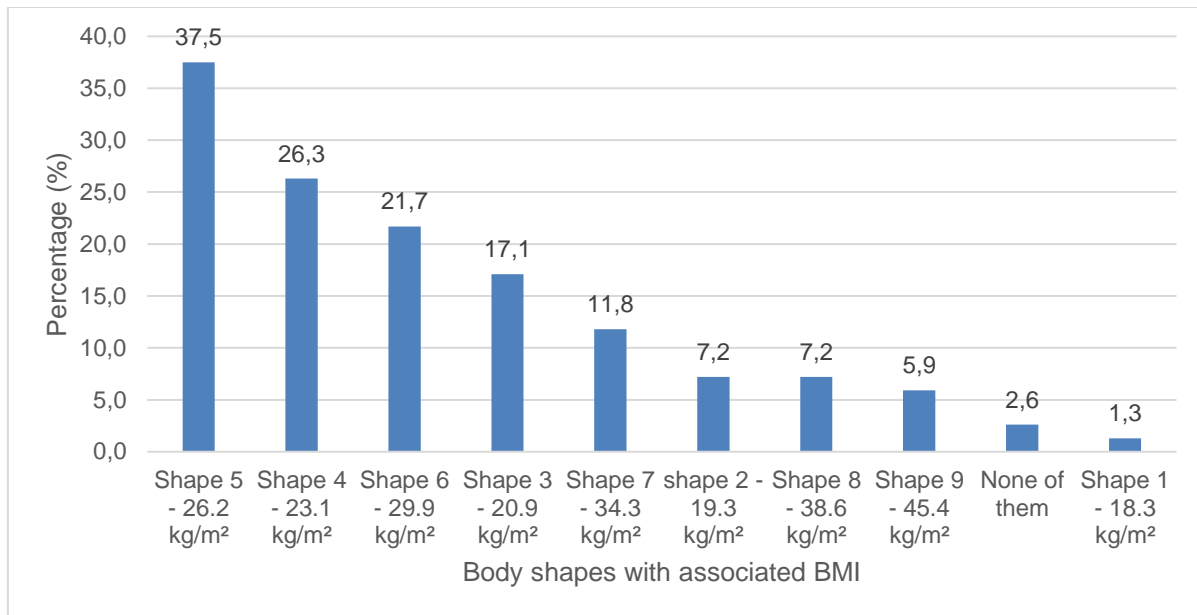
<sup>8</sup> A percent greater than 100% was possible because the nurses could select more than one body shape for each question.



**Figure 4.19:** The nurses' perceptions of weak body shapes

#### 4.12.10 Associated with being strong

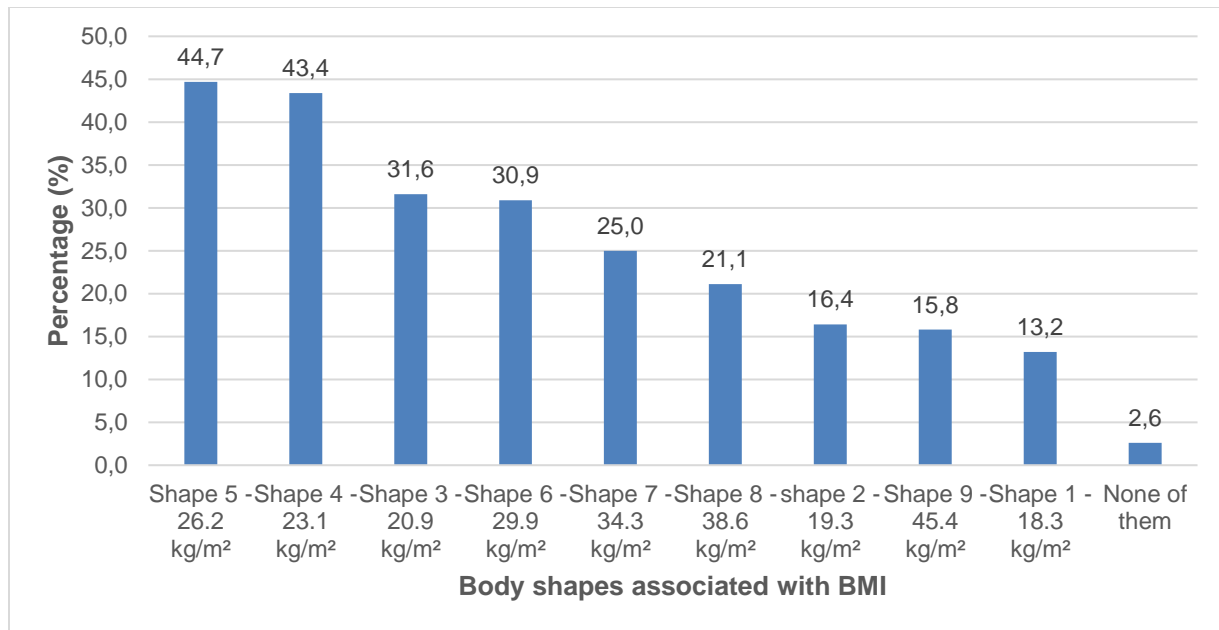
Strength was associated with both overweight/shapes five and six (59.2%, 89/150) and normal weight/shapes two, three and four (50.6%, 76/150) (Figure 4.20). There were no significant relationships between culture and the area they grew up in, but the Independent samples t-test demonstrated a significant relationship between age and shape three for being strong. The older nurses were more likely to associate normal weight/shape three with strength,  $t(147) = 2.370, p=0.019$ .



**Figure 4.20:** The nurses' perceptions of strong body shapes

#### 4.12.11 Associated with being able to bear children

The most commonly chosen shapes were normal weight/shape two, three and four (91.4%, 137/150) and overweight/shapes five and six (75.6%, 113/150) (Figure 4.21). Obese/shapes seven, eight and nine were chosen by many (61.9%, 93/150). There were no significant relationships between culture and age regarding the ability to bear children. The Fisher's exact test demonstrated a significant relationship between the area they grew up in and overweight shapes five, six and obese shapes eight and nine, for being able to bear children. Those from urban areas chose overweight shape five ( $p=0.019$ ). Those from suburban areas chose shapes six ( $p= 0.033$ ), eight, ( $p= 0.019$ ) and nine ( $p=0.003$ ).

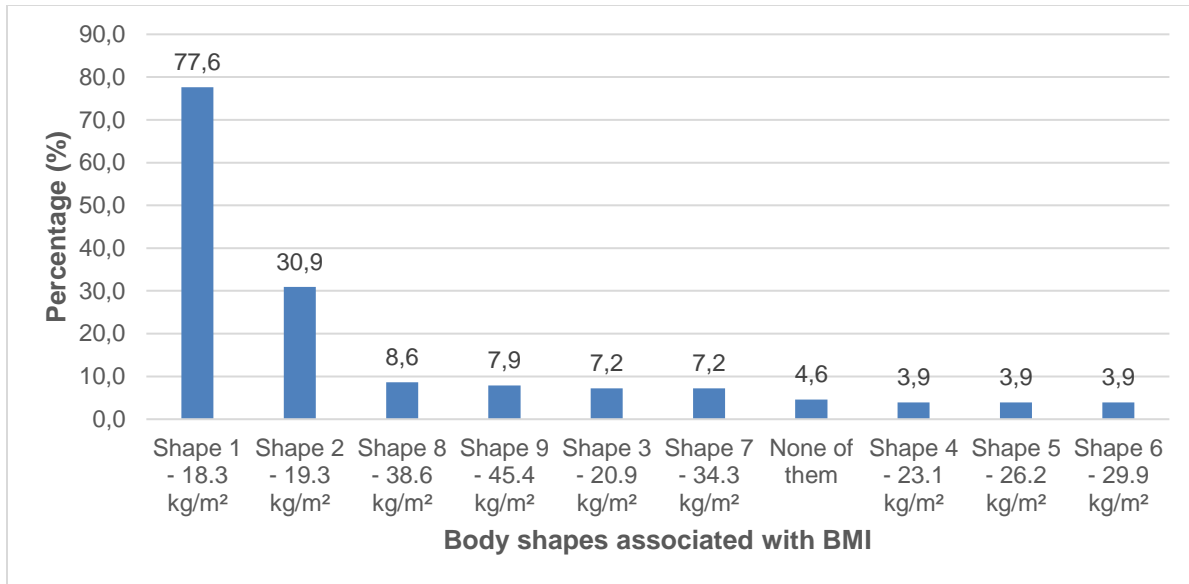


**Figure 4.21:** The nurses' perceptions of body shapes associated with the ability to bear children

#### 4.12.12 Associated with hard times or being poor

Underweight/shape one (77.6%, 116/150) and normal weight/shape two (30.9%, 46/150) were associated with poverty by many (Figure 4.22). Obese/shapes seven, eight and nine (23.7%, 36/150) were also associated with poverty, as some mentioned that poverty causes a person to eat more samp<sup>9</sup>, which is starch, thus causing weight gain. There were no significant relationships between culture and age regarding poverty. The Fisher's exact test demonstrated a significant relationship between the area they grew up in and normal weight (shapes three, four), overweight (shapes five, six) and obesity (shape seven) regarding poverty. Those from suburban areas chose normal shape three ( $p=0.011$ ). Those from suburban area chose shapes four ( $p=0.001$ ), five ( $p=0.019$ ), six ( $p=0.019$ ) and seven ( $p=0.003$ ).

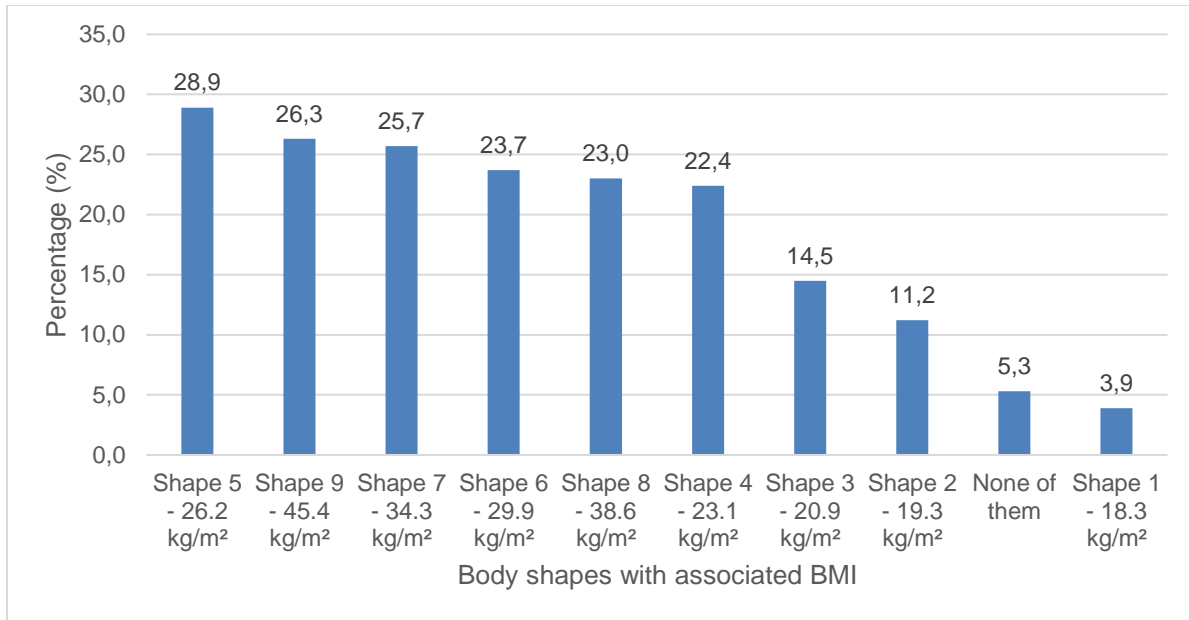
<sup>9</sup> Samp consists of coarsely chopped or stamped dried maize kernels.



**Figure 4.22:** The nurses' perceptions of body shapes associated with poverty

#### 4.12.13 Associated with wealth

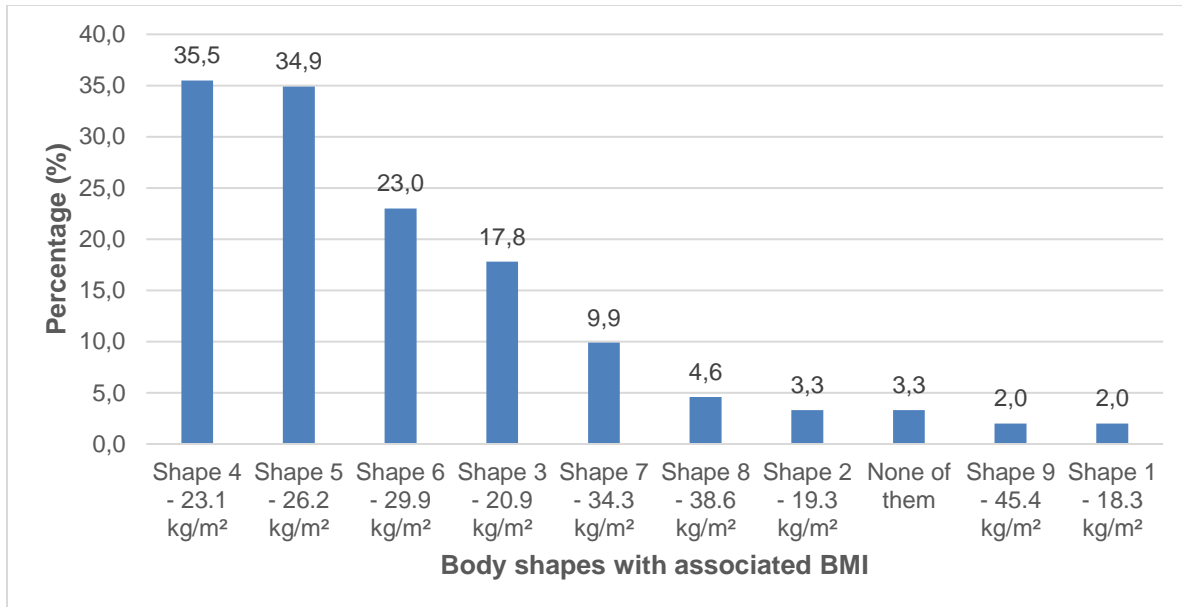
Many (75.0%, 113/150) associated obese/shapes seven, eight and nine with wealth and also overweight/shapes five and six (52.6%, 79/150) (Figure 4.23). The Fisher's exact test demonstrated a significant relationship between the area they grew up in and wealth. Those from the suburban area chose underweight shapes one ( $p=0.005$ ) and normal weight shape four, ( $p=0.036$ ).



**Figure 4.23:** The nurses' perceptions of body shapes associated with wealth

#### 4.12.14 Most desirable in your family

Over half (57.9%, 87/150) chose overweight/shapes five and six and/or normal weight/shapes two, three and four (56.6%, 85/150) (Figure 4.24). The Independent Samples t-test demonstrated a significant relationship between age and the most desirable in the family,  $t(7.069) = -6.846, p < 0.0005$ . Those who chose none of these (3.3%, 5/150) were on average younger.



**Figure 4.24:** The nurses' perception of most desirable body shapes in their family

In summary, underweight shape one was perceived as being thin and representative of an individual infected with HIV/AIDS or TB or who was weak and/or poor (Table 4.4). Normal BMI/ shape two was perceived as being thin, and representative of an individual infected with HIV/AIDS or TB or who was weak and/or poor, but it was also associated with the ability to bear children. Normal BMI/ shapes three and four were associated with health, strength and the ability to bear children. Body shapes five and six (overweight) were considered as the most desirable in their culture, most preferred by men in their culture, most preferred in their family, and were associated with strength and the ability to bear children. Body shapes seven, eight and nine (obese) were associated with wealth but were perceived as being the most unhealthy.



**Table 4.4:** Summary of results regarding the association of body shapes from the Stunkard FRS with cultural beliefs (%)

	Underweight (shape 1)	Normal weight (shape 2, 3, 4)	Overweight (shape 5, 6)	Obese (shape 7, 8, 9)
The most healthy	6.6	90.1	27.0	2.7
The most unhealthy	37.5	2.0	4.6	109.9*
Overweight	0.0	0.0	11.9	134.8*
Obese	0.0	0.0	2.7	123.7*
Thin	96.1	21.7	0.0	0.0
The most desirable in your culture	3.3	32.3	65.8	23.0
Most preferred by men of my culture	2.0	38.8	69.8	23.0
Associated with HIV/AIDS or TB	84.2	37.5	9.2	13.8
Associated with being weak	84.9	23.7	2.0	8.6
Associated with being strong	1.3	50.6	59.2	24.9
Being able to bear children	13.2	91.4	75.6	61.9
Associated with hard times/ being poor	77.6	42.0	7.8	23.7
Associated with wealth	3.9	48.1	52.6	75.0
Most desirable in your family	2.0	56.6	57.9	16.5

(\*) The nurses chose more than one shape resulting in a percentage value of over 100%

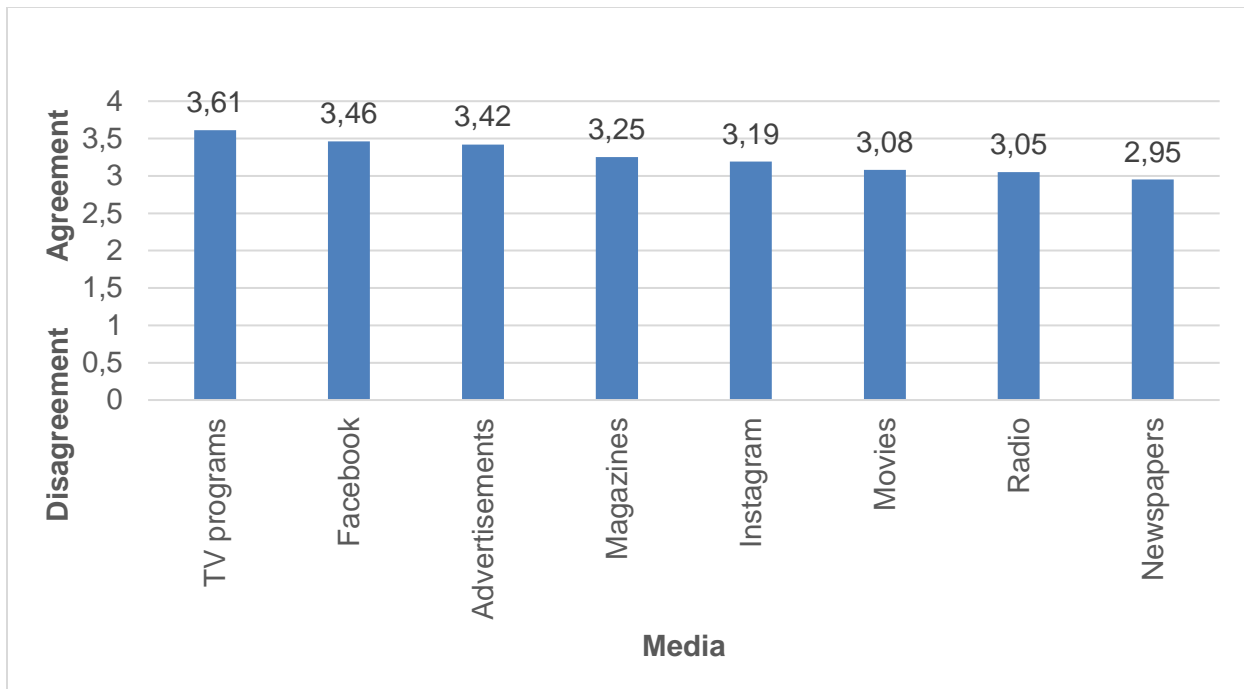
#### 4.13 INFLUENCE OF MEDIA ON BODY IMAGE PERCEPTION

The One sample t-test demonstrated significant agreement ( $M=3.81$ ,  $SD \pm 1.0$ ) that media in general influenced the nurses to desire a smaller body size,  $t(149) = 9.903$ ,  $p < 0.0005$ . Overall the principal media influence was TV (68.7%, 103/150), followed by advertisements (63.3%, 95/150), Facebook (54.0%, 81/150) and magazines (52.0%, 78/150) (Table 4.5) and (Figure 4.25).

**Table 4.5:** Influence of media on the nurses' desired body shape

<b>Media</b>	<b>Disagree %(n)</b>	<b>Neutral %(n)</b>	<b>Agree %(n)</b>	<b>N/A %(n)*</b>
Movies	34.0 (51)	20.0 (30)	45.3 (68)	0.7 (1)
Magazines	28.6 (43)	19.3 (29)	52.0 (78)	0
TV programs	17.3 (26)	14.0 (21)	68.7 (103)	0
Radio	32.6 (49)	27.3 (41)	39.3 (59)	0.7 (1)
Newspapers	38.7 (58)	22.7 (34)	38.0 (57)	0.7 (1)
Advertisements	26.7 (40)	10.0 (15)	63.3 (95)	0
Facebook	25.3 (38)	7.3 (11)	54.0 (81)	13.3 (20)
Instagram	27.3 (41)	11.3 (17)	36.7 (55)	24.7 (37)

\*Not applicable (N/A) was for the nurses who were not using that specific source of media.



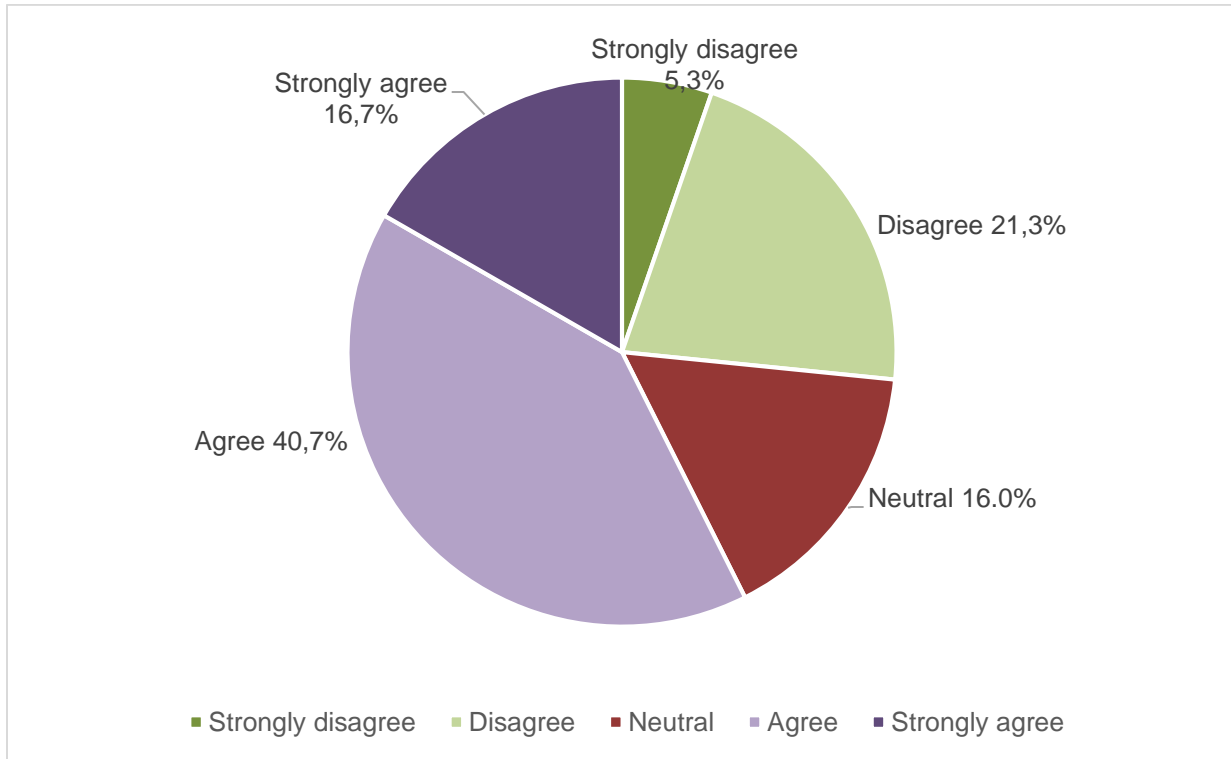
**Figure 4.25:** The most to the least influential source of media

The Pearson's correlation coefficient demonstrated a significant positive correlation between age and the influence of radio ( $r=0.262$ ,  $p=0.001$ ) and newspapers ( $r=0.176$ ,  $p=0.033$ ). The older nurses were more influenced by radio and newspaper. There was a significant negative correlation between age and the influence of Facebook ( $r= -0.198$ ,  $p=0.024$ ) and Instagram ( $r= -0.205$ ,  $p=0.030$ ). The older nurses were less influenced by Facebook and Instagram.

Although the influence of the various types of media was primarily not related to the area where the nurses grew up in, the ANOVA test demonstrated that those from rural areas were significantly more influenced by radio,  $F(3,145) = 4.015$ ,  $p=0.009$ . The Pearson's correlation coefficient demonstrated a positive correlation between the influence of radio and experience ( $r=0.172$ ,  $p=0.038$ ) and being a role model ( $r=0.222$ ,  $p=0.006$ ). The older nurses with more experience and who perceived themselves as a role model were more influenced by radio.

#### 4.14 MEDIA VERSUS CULTURE

Just over half (57.4%, 86/150) agreed that media had a greater influence on their body shape than cultural beliefs versus 26.6% (40/150) who disagreed (Figure 4.26). The One sample t-test demonstrated a significant agreement ( $M=3.42$ ,  $SD \pm 1.2$ ) that media had a greater influence than cultural beliefs on the nurses' body shape,  $t(149) = 4.456$ ,  $p < 0.0005$ .



**Figure 4.26:** The influence of media versus cultural beliefs on the nurses' body shape

Some (38.6%, 58/150) felt more connected with the media than their cultural beliefs, since the media promoted healthy lifestyles and the consequences of being fat. The advertisements always promoted small sized clothes, losing weight and weight loss products. Since the media in general always portrayed thin women as being beautiful and fat people as being unhealthy with low esteem and confidence (2.7%, 4/150), some (7.3%, 11/150) felt motivated to lose weight by following weight loss pages on Facebook.

The following are extracts from the questionnaires:

*“Everybody watches TV so it influences me and I want to look like someone who looks nice on TV”, (40 years old, BMI: 37.1 kg/m<sup>2</sup>).*

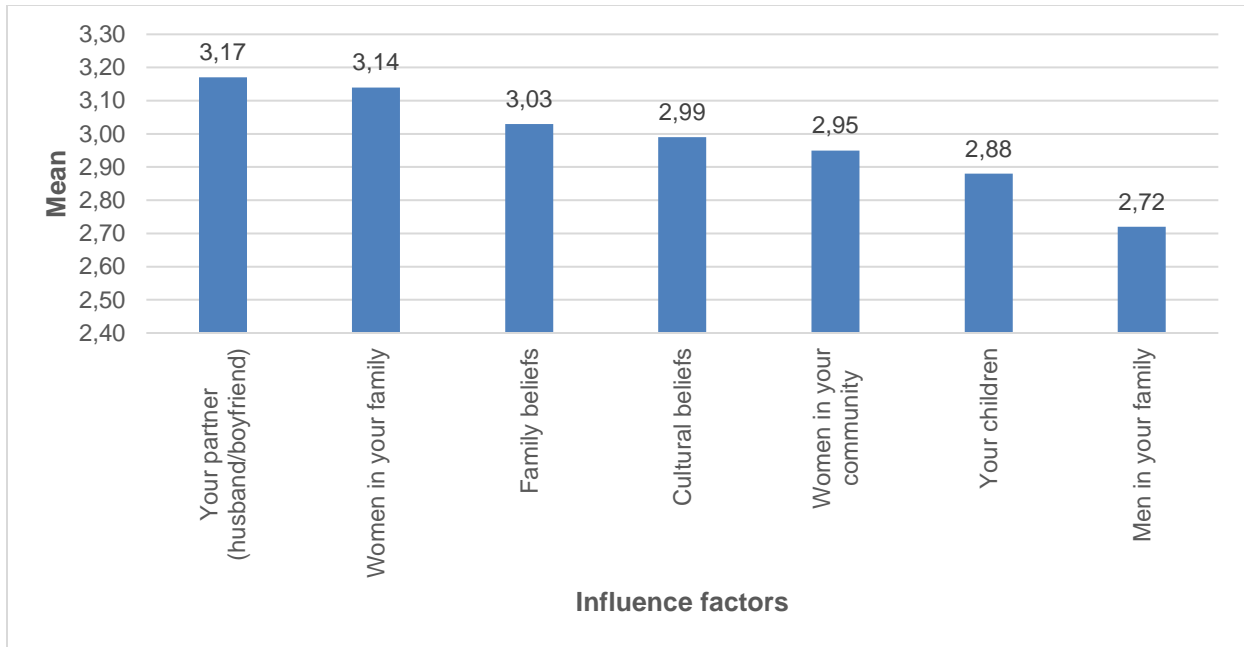
*“On Facebook, I follow a lot of pages regarding weight loss. I don’t care about my culture”, (42 years old, BMI: 42.7 kg/m<sup>2</sup>).*

A few (8.7%;13/150) felt that watching TV programs about health educated them about many things that they could practice, such as exercise, healthy eating tips or preparing a proper balanced meal. In particular, watching fashion, food, health and gardening channels influenced them to lose weight, prepare healthier meals and keep fit.

Those (14.7%; 22/150) who held cultural values in high esteem did not support losing weight. Some (15.3%; 23/150) were neutral since they felt that neither media nor cultural beliefs influenced the way they felt about their body shape and they did not really follow media

#### 4.15 FAMILY BELIEFS

The nurses were asked what influenced their feelings about their body as opposed to more general beliefs regarding culture. The One sample t-test demonstrated that the opinion of their partner was the most influential factor ( $t(145) = 1.633, p=0.105$ ) followed closely by the opinions of the women in the family ( $t(149) = 1.502, p=0.135$ ) and family beliefs ( $t(149) = 0.271, p=0.787$ ) (Figure 4.27). The One sample t-test demonstrated that there was significant disagreement ( $M=2.72, SD \pm 1.1$ ) that the men in the family (27.6%, 40/145) had any influence on the way they felt about their body shapes,  $t(144) = -2.980, p=0.003$ .



**Figure 4.27:** The influence of family beliefs on the nurses' body shape

### Partner

Many said that their partner liked their body shape or encouraged them to lose weight (34.7%, 52/150) or to keep fit by eating healthy and doing exercise at the gym.

Comments extracted from the questionnaire follow:

*“According to men in my family and my partner, my body shape is good, but my sister and my son think I am fat, (BMI: 35.6 kg/m<sup>2</sup>)”*

*“My partner is happy with my body (BMI: 38.3 kg/m<sup>2</sup>)”.*

*“My husband is happy with my weight (BMI: 27.7 kg/m<sup>2</sup>)”.*

*“My boyfriend influences me to lose weight. Sometimes I feel ashamed when we are walking in the mall and my boyfriend is looking at slimmer ladies. I feel jealous, (BMI: 43.3 kg/m<sup>2</sup>)”.*

*“My partner complains that I have put on weight. My mum says the same thing as well. I feel good about my body shape because I used to be slim, (BMI: 32.7 kg/m<sup>2</sup>)”.*

## Family beliefs

Some (23.3%, 35/150) stated that both men and women in their family encouraged them to lose weight. Their children would encourage them to lose weight by pointing out that they were putting on weight (10.7%, 16/150). Some (11.3%, 17/150) felt encouraged by their children to do exercise and cut down on junk food<sup>10</sup> to lose weight, while others (8.7%, 13/150) had women in their family to always encourage each other to lose weight and keep fit.

Comments extracted from the questionnaire follow:

*“Men in my family criticize my body shape. They say I need to lose weight, (BMI: 36.6 kg/m<sup>2</sup>)”.*

*“My children want me to lose weight to be able to participate in activities with them, (BMI: 38.7 kg/m<sup>2</sup>)”.*

*“My children feel very ashamed of my body and as a result, I feel very embarrassed, (BMI: 33.2 kg/m<sup>2</sup>)”.*

*“My daughter encourages me to exercise and stop eating junk food, (BMI: 39.6 kg/m<sup>2</sup>)”.*

*“Women in my family compliments me on my body shape but my daughter tells me I need to lose some weight, (BMI: 39.5 kg/m<sup>2</sup>)”.*

*“Nobody in my family says anything about my body shape, (BMI: 28.7 kg/m<sup>2</sup>)”.*

*“Men in my family and women in my family encourage me to put on weight but my husband and children are happy with my weight, (BMI: 27.7 kg/m<sup>2</sup>)”.*

## Culture

Regarding the impact of cultural beliefs on body shape, a few (8.0%,12/150) said that in the Zulu culture, men preferred a full woman with curves. Cultural beliefs were important because they believed that the bigger the body, the healthier the person is and being thin was considered unhealthy and was associated with sickness. Others

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<sup>10</sup> Junk food: Food that contributes increased calories above requirements but little nutritional value (WebMD 2017b).

(5.3%, 8/150) felt that according to their culture, their weight and body shape were good.

Comments extracted from the questionnaire follow:

*“In the Zulu culture, it is believed that you are not supposed to be thin or obese. You must have curves. Therefore, I try to keep my body in shape avoiding being too thin or overweight, (BMI: 27.3 kg/m<sup>2</sup>)”.*

*“According to my culture, my weight and size is good, (BMI: 28.7 kg/m<sup>2</sup>)”.*

*“In our culture, if you are big, it seems you are happy and well-off, (BMI: 38.3 kg/m<sup>2</sup>)”.*

*“My culture likes an average body weight as being thin is associated with sickness, (BMI: 33.3 kg/m<sup>2</sup>)”.*

*“In Zulu culture, bigger women are appreciated but I am happy with my body, (BMI: 27.7 kg/m<sup>2</sup>)”.*

*“As a Zulu female, sometimes people see me as not attractive since I am not fat, but I am happy about my weight. I am trying to eat healthy food and exercise sometimes, (BMI: 24.9 kg/m<sup>2</sup>)”.*

*“I am a cultural person but also very open minded to change. I am happy with my body shape although I can do with a little healthier diet, (BMI: 30.4 kg/m<sup>2</sup>)”.*

For some (6.0%, 9/150), none of the factors influenced the way they felt about their body shape but instead they wanted to lose weight for themselves to be more confident, to look good and to be able to wear what they felt like.

*“I feel good about my body shape. I don’t care about how others feel. I am from a rural area where they believe culturally I should be bigger, but I like the way I am, (BMI: 22.2 kg/m<sup>2</sup>)”.*

*“I am happy with my weight and body shape. I cannot change my body for someone, (BMI: 33.6 kg/m<sup>2</sup>)”.*

*“I don’t feel comfortable about my body shape. It influences me to lose weight so that I can wear whatever I like, (BMI: 31.6 kg/m<sup>2</sup>)”.*



Some (10.7%, 16/150) were comfortable and content with their body shape and their family and friends had no complaints, but instead complimented them on their body shapes.

*“I feel confident about my body shape. There is nothing I want to change about my body, (BMI: 24.4 kg/m<sup>2</sup>)”.*

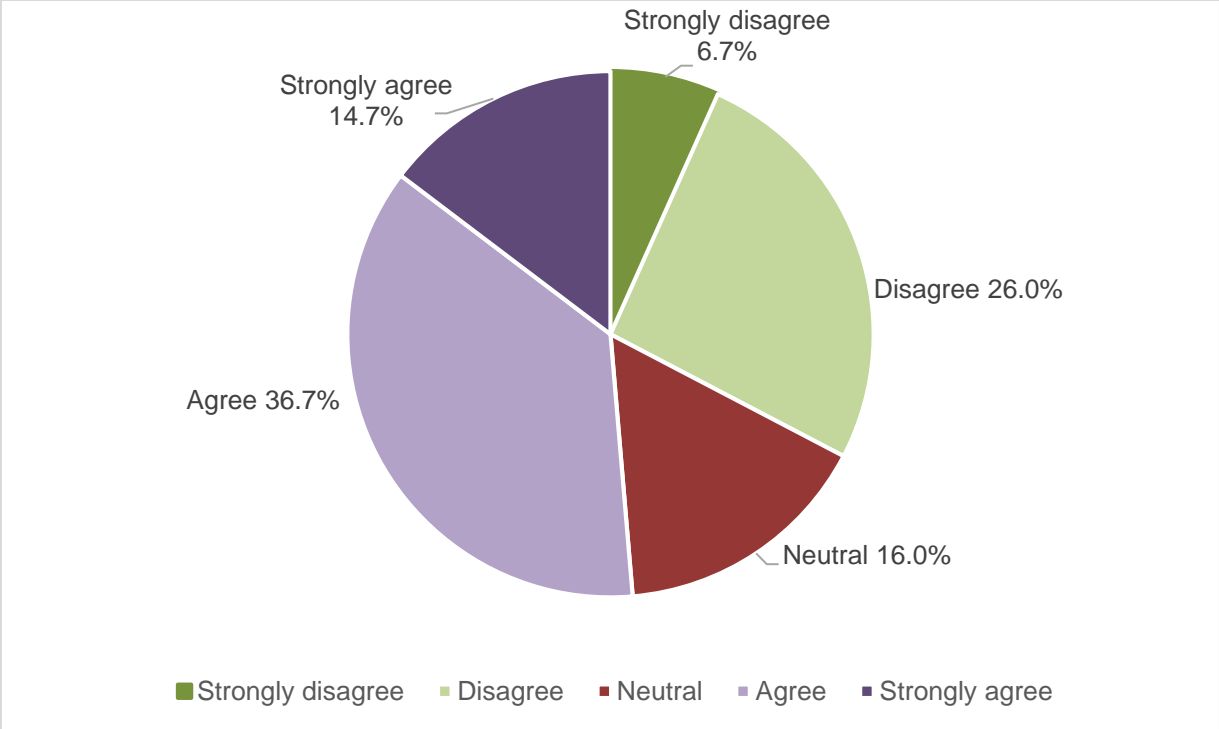
*“I feel good about my body because I never have someone to tell me that I should lose some weight. I am the one who always decides, not because someone is putting me under pressure, (BMI: 30.4 kg/m<sup>2</sup>)”.*

Some (6.7%, 10/150) felt good about their body shape but would like to work harder to keep their bodies in shape even if they were from a rural area, where they believed culturally they should have been bigger.

In summary, the nurses were more influenced by their family members than cultural beliefs. This showed a shift in attitude even though the prevalence of overweight and obesity was very high. Many were willing to lose while some were still influenced by cultural beliefs and believed being plump and curvier was more accepted within the culture than being thin.

#### 4.16 FAMILY BELIEFS VERSUS CULTURE

Half (51.4%, 77/150) agreed that their family had a stronger influence on their shape than cultural beliefs, versus 32.7% (49/150) who disagreed (Figure 4.28). There was significant agreement ( $M=3.27$ ,  $SD \pm 1.2$ ) that family had a bigger influence than cultural beliefs on the nurses' body shape,  $t(149) = 2.742$ ,  $p=0.007$ . The Pearson's correlation coefficient was used to test for significance across age and family beliefs over cultural beliefs and no correlation with age was observed.



**Figure 4.28:** The influence of family beliefs versus cultural beliefs on the nurses' body shape

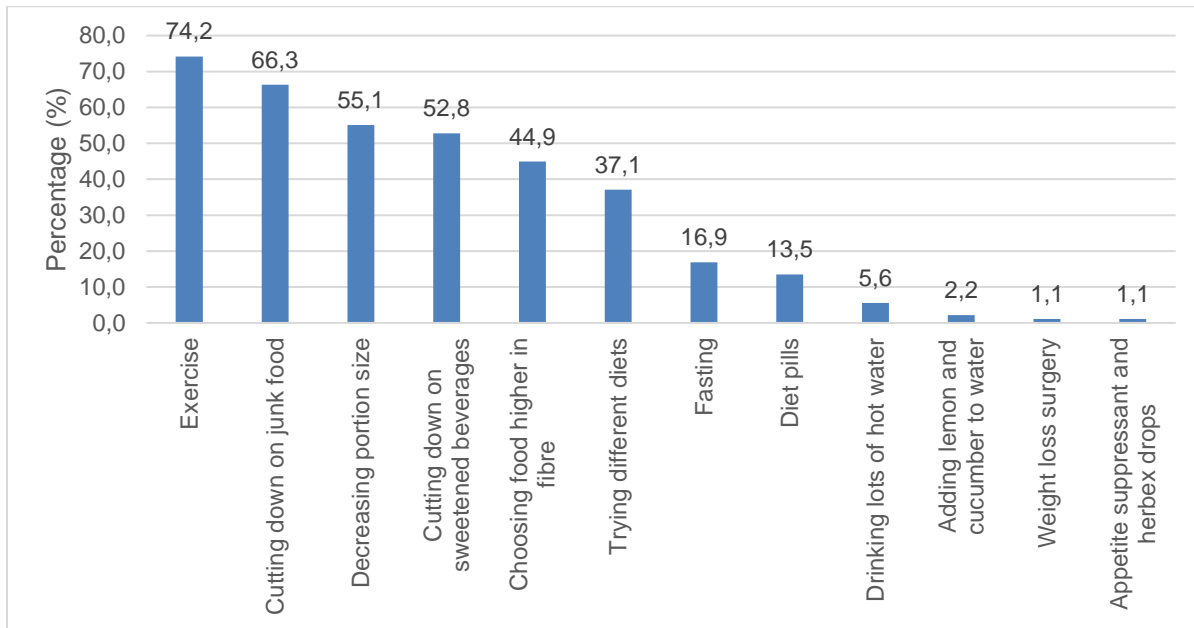
**4.17 ATTEMPTS TO REDUCE WEIGHT**

The Binomial test demonstrated that a significant proportion (59.3%, 89/150) had tried to reduce weight (59.0%,  $p=0.27$ ), but the One sample t-test demonstrated no significant success or lack of success to reduce weight.

Methods of weight loss

Many (74.2%, 66/89) increased exercise, cut down on junk food (66.3%, 59/89), decreased portion sizes (55.1%, 49/89), reduced their intake of sweetened beverages (52.8%, 47/89) and chose foods higher in fibre (44.9%, 40/89) (Figure 4.29). Different diets that had been followed included low carbohydrate, low fat or carbohydrate free diets (37.1%, 33/89). Some chose fasting (16.9%, 15/89), 13.5% (12/89) used diet pills, 5.6% (5/89) tried drinking lots of hot water before meals, some added lemon and cucumber to the water (2.2%, 2/89), 1.1% (1/89) had undergone weight loss surgery

and 1.1% (1/89) used an appetite suppressant and metabolic enhancers e.g. herbex drops



**Figure 4.29:** Methods of weight loss

For each of the options listed above, the Binomial test was applied to test for selection significance and it was observed that exercise (74.0%,  $p < 0.0005$ ) and cutting down on junk food (66.0%,  $p = 0.003$ ) were selected significantly more often as weight loss methods.

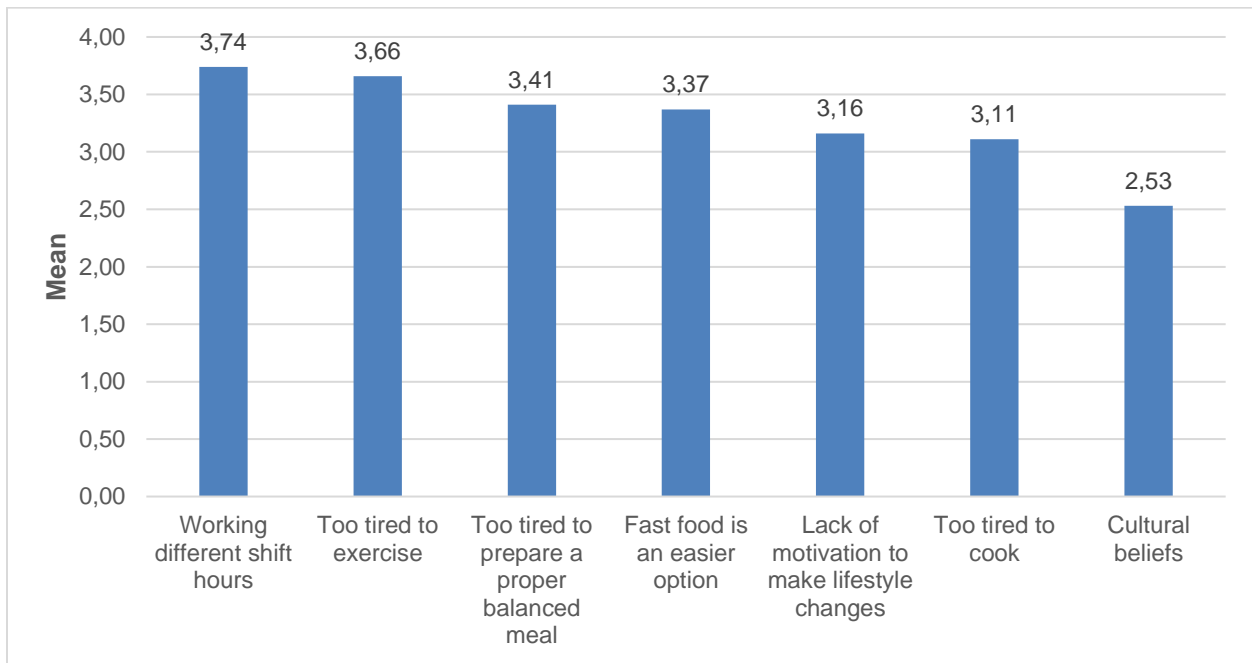
#### 4.18 BARRIERS TO BODY WEIGHT CONTROL AMONGST NURSES

The One sample t-test demonstrated significant agreement that working different/long shift hours ( $M = 3.74$ ,  $SD \pm 1.0$ ),  $t(144) = 8.629$ ,  $p < 0.0005$ , followed by being too tired to exercise ( $M = 3.66$ ,  $SD \pm 1.2$ ),  $t(144) = 6.503$ ,  $p < 0.0005$  or to prepare balanced meals ( $M = 3.41$ ,  $SD \pm 1.3$ ),  $t(144) = 3.852$ ,  $p < 0.0005$  resulting in fast food<sup>11</sup> being an easier

<sup>11</sup> Fast food – An easily prepared processed meal which is served at snack bars or restaurants as a quick meal or to be taken away (Oxford University Press 2017)

option (M=3.37, SD ± 1.3),  $t(144) = 3.377$ ,  $p=0.001$  were the main factors that made it difficult for nurses to control their weight (Figure 4.30).

There was significant disagreement that cultural beliefs (M=2.53, SD ± 1.1) prevented nurses from being able to control their weight ( $t(144) = -5.078$ ,  $p<0.0005$ ) which means that cultural beliefs were not a barrier to weight loss.



**Figure 4.30:** Barriers to body weight control amongst nurses

#### 4.19 SUMMARY

The sample size was representative of this study population. The mean age was 34 years and the mean nursing experience was six years with over half who grew up in a rural area. Most were of the Zulu culture and the majority were satisfied with their career choice and saw themselves as role models in the community. Most had no medical conditions and very few NCDs were listed but 19.3% were taking medications with potential to cause weight gain. Three nurses had medical conditions that caused weight gain, namely the PCOS, hypothyroidism and insulin resistance. The mean BMI was 32.1 kg/m<sup>2</sup> which is obese class I, while the perceived BMI was 28.2% kg/m<sup>2</sup> which is overweight. The prevalence of overweight and obesity was very high (88.7%). The

nurses had a high body fat percentage and a normal mean FFM. The nurses wrongly perceived their body image by thinking they were of normal weight/overweight when they were in fact either overweight or obese. Just over half wanted to lose weight by one or two shapes. Culturally, an overweight body shape was still preferred, and HIV/AIDS, weakness and poverty was still associated with thinness. Strength and the ability to bear children were associated with overweight body shapes while wealth was associated with obese body shapes. The nurses also do not seem to know the difference between overweight and obese body shapes. There seemed to be a shift in attitude as the nurses were more influenced by media and family beliefs than culture and were willing to lose weight although they still favoured an overweight body shape. The nurses did not want to be obese or thin as they still preferred a curvy body. This was probably due to the fact that being thin was associated with sickness within their culture. Older nurses were more influenced by radio and newspapers while younger nurses were more influenced by Facebook and Instagram. This shift in attitude was probably due to all the media sources and easy internet access now available to the population. The nurses were mostly influenced by their partner to lose/gain or maintain body weight. For some nurses, culture was more important as a curvy woman is admired and respected by people within their culture. They did not believe as much in media for they believed cultural values were more important. Over half had tried to lose weight with most trying exercise and cutting down on junk food followed by decreasing portion size and reducing their intake of sweetened beverages. Working long/different shift hours, being too tired to exercise or to prepare a balanced meal resulted in fast food being an easier option for the nurses. These factors were identified as barriers to body weight control amongst nurses.

## **CHAPTER 5: DISCUSSION**

### **5.1 INTRODUCTION**

The following objectives were investigated amongst black female nurses practising in a private hospital in Durban, KZN, SA.

1.3.9 To determine the prevalence of overweight and obesity.

1.3.10 To determine their body fat percentage and FFM.

1.3.11 To determine how they perceived their body image.

1.3.12 To determine whether they were satisfied with their body shape.

1.3.13 To determine whether their cultural beliefs influenced their body image perception.

1.3.14 To determine whether they were influenced by media to lose weight and whether the influence of media overpowered their cultural beliefs.

1.3.15 To determine whether family beliefs influenced the way they felt about their body image.

1.3.16 To determine which factors were barriers to their body weight control.

This chapter discussed the results presented in chapter 4.

### **5.2 RESPONSE RATE**

The response rate was 67.6% (152/225). According to the statistician, the sample size should have been a minimum of 63.1% (142/225) to be representative and therefore, the sample was representative of this study population.

### **5.3 STUDY POPULATION**

The sample comprised of 152 black female nurses whose mean age was 34 years with a mean nursing experience of 6 years, of whom just over half (56.0%) grew up in a rural area and most were of the Zulu culture (82.0%).

#### 5.4 SATISFACTION WITH CAREER CHOICE

Many (78.0%) were satisfied/very satisfied with their career choice. In SA, during the Apartheid era, the black population had a very limited earning capacity (Micklesfield *et al* 2013). Very few jobs were available to the black population, one of which was the nursing profession which was open to young African women. Since studying nursing did not require university fees and because a student nurse could earn while studying, it was possible for many young African women to become nurses (Nursing Act 1957). Many chose this career therefore, not out of a passion for the job but instead to be able to earn and feed their families. It was therefore essential to determine whether the nurses, particularly the older ones were satisfied with their career choice. If the nurse was in the profession simply out of necessity to earn a living, it was assumed that they would not feel an obligation or passion to be role models in the community and therefore would not adopt healthy behaviours.

#### 5.5 ROLE MODELS

Being HCWs, who assumedly have more knowledge than the general population regarding the consequences of obesity, it was expected that the prevalence of overweight and obesity would be lower amongst the nurses, if they strongly considered themselves as role models.

Although being overweight or obese meant that they were not role models of a healthy lifestyle, most (87.3%) strongly agreed/agreed that they saw themselves as role models in the community. Nurses who were most likely to see themselves as role models also had a higher body fat percentage, which was surprising because it was expected that the nurses within the normal BMI range would be more likely to see themselves as role models. Since a bigger body shape is embraced amongst black women, perhaps the nurses felt themselves to be role models because they did not perceive that they were overweight/obese.

According to Pervez & Ramonaledi (2017), overweight nurses were poor role models as their weight undermined their credibility to give advice on weight control and therefore it was essential to improve nursing education regarding obesity.

## 5.6 MEDICAL CONDITIONS AND MEDICATIONS

Despite the high prevalence of overweight/obesity, most were apparently healthy as many (74.0%) did not list any medical conditions. Non-communicable diseases, of which overweight and obesity is a risk factor, account for 37.0% of all group causes of deaths in SA (Shisana *et al* 2013). According to Skaal & Pengpid (2011), the prevalence of hypertension was 20.0%, diabetes was 12.0%, heart disease was 3.0% and respiratory disease was 6.0% (total 41.0%), amongst 100 HCWs practicing in Pretoria. The prevalence of NCDs (high blood pressure, asthma, diabetes) in this study was surprisingly low (8.7%), considering the high prevalence in SA. This could be due to underreporting because no tests were conducted on the nurses to check their blood pressure or sugar levels. It is possible that they were also unaware of existing conditions.

Very few reported having HIV/AIDS (4.7%) which was unexpected since Statistics South Africa (2016) estimated the prevalence to be 18.9% amongst SA adults aged 15-49 years. The prevalence of HIV was found to be 15.7% in a sample of 595 SA HCWs from both public and private health facilities in the Free State, KZN, Mpumalanga and North West in 2002 (Shisana, Hall, Maluleke, Chauveau & Schwabe 2004). The HIV status of the nurses in this study was not tested. The low prevalence could be due to under reporting, which is common due to the stigma associated with the disease in SA (Campbell, Foulis, Maimane & Sibiyi 2005).

Conditions which could have exacerbated weight gain, included insulin resistance (0.7%), PCOS (0.7%) and hypothyroidism (0.7%). The occurrence was not high enough to influence the prevalence of overweight and obesity in this sample as only three nurses suffered from these conditions. Medications potentially causing weight gain were being taken by 19.3%, which may have contributed to the prevalence of



overweight and obesity. The most commonly taken contraceptive Depo Provera (8.0%) is known to cause weight gain (Espey *et al* 2000). Qualitative, in-depth interviews were conducted in Cape Town on ten overweight black women who blamed their large body size on the contraceptive injection, Depo Provera (Mvo *et al* 1999). In summary, 21.3% either had medical conditions or were taking medications that could cause weight gain.

## 5.7 PREVALENCE OF OVERWEIGHT AND OBESITY

The hypothesis that the prevalence of overweight and obesity would be low amongst black SA nurses was rejected because their mean BMI of 32.1 kg/m<sup>2</sup> classified them as obese class I.

Their mean BMI was higher than that of the black nurses practicing in Limpopo (31.7 kg/m<sup>2</sup>) (Goon *et al* 2013). This possibly indicates a trend of an increase in the prevalence of overweight and obesity amongst black nurses in SA. As the mean BMI was higher in nurses in this study than the general black female population in SA (29.2 kg/m<sup>2</sup>) (SADHS 2016), being a nurse did not encourage the adoption of healthy lifestyle behaviours.

Most nurses in this study (88.7%) were either overweight (34.4%) or obese (54.3%). In general, this was higher than that found amongst the black female nurses from Limpopo (81.8%), where the prevalence of overweight (26.0%) was lower although the prevalence of obesity (55.8%) was similar (Goon *et al* 2013). In the Eastern Cape study, the prevalence of overweight (36.4%) was higher and the prevalence of obesity (21.8%) was much lower amongst female nursing students (Van Den Berg *et al* 2012), when compared to this study and that of Goon *et al* (2013). This difference in prevalence could be due to the nursing students having a lower mean age. The Limpopo study and the current study amongst nurses demonstrated that the prevalence of overweight fluctuated, while the high prevalence of obesity remained similar. The HCWs in Pretoria demonstrated a lower prevalence (74.0%) of overweight (30.0%) and obesity (44.0%), confirming that the prevalence was higher in the nurses (Skaal & Pengpid 2011).

In SA, the prevalence of obesity amongst black African females is 58.5% (Shisana *et al* 2013) which is slightly higher than the prevalence ( $\pm 55.0\%$ ) amongst the nurses in the current study and the other study by Goon *et al* (2013). This study confirmed the opinion of Goon *et al* (2013), who suggested that obesity is as prevalent amongst SA nurses as it is in the general population. Even though nurses are educated HCWs, they have not appeared to have changed their behaviour and adopted a healthy lifestyle therefore education has not equated to changes in behaviour and lifestyle.

The prevalence of overweight and obesity (88.7%) was higher than that found amongst nurses internationally which was 69.1% in Scotland (Kyle *et al* 2016), 61.8% in New Zealand, 61.3% in Australia, 59.1% in the UK (Bogossian *et al* 2012) and 54.2-57.0% in the USA (Zitkus 2011; Miller *et al* 2008). These results suggest that SA is facing a more serious epidemic of obesity amongst nurses than that experienced internationally.

## 5.8 BODY COMPOSITION

The hypothesis that the nurses would have a low body fat percentage was rejected as the mean body fat percentage (43.8%) was significantly higher than the normal range (20.9-27.0%). According to our knowledge, this was the first study in SA that used multi-frequency BIA to determine the body fat percentage of nurses.

The only other study to our knowledge that investigated body fat percentage of nurses was conducted by Naidoo & Coopoo (2007). Skinfold readings at three sites (triceps, subscapular, suprailiac) were measured and body fat percentage was calculated using an undisclosed equation. However, since only overweight and obese nurses participated in the study by Naidoo & Coopoo (2007), the results therefore do not reflect the body fat percentage or BMI of the nursing population in general, therefore the results have not been included.

Three hundred and twenty-two Bodystat 1500 bio-impedance analyzers that had data from 23,626 UK adults (male – 11,582, female – 12,044) aged 18 to 99 years were returned to the company for servicing from 2000-2006. Using the data from these machines, Meeuwssen, Horgan & Elia (2010) determined that the body fat percentage

increased in women with age. This could explain the finding in this study which demonstrated that the more experienced nursing staff, who were older, tended to have a higher body fat percent.

The hypothesis that the nurses would have a normal FFM was accepted because their mean FFM (44.6 kg) was within the mean normal FFM range (43.2-46.9 kg) demonstrating that the nurses on average carried a high fat mass and normal muscle mass. This could be due to the nurses increased physical activity as part of their daily work routine. Although the mean FFM was in the mean normal range, almost a third (32.0%) needed to improve their FFM.

According to Byrne, Weinsier, Hunter, Desmond, Patterson, Darnell & Zuckerman (2003), the metabolic rate of FFM is higher than that of fat tissue, therefore FFM uses more energy than fat mass and hence could help control body weight. Since some needed to improve their FFM, resistance exercise could increase the FFM, increasing the resting metabolic rate (RMR) thereby contributing to weight loss (Willis, Slentz, Bateman, Shields, Piner, Bales, Houmard & Kraus 1985). The loss of fat mass while maintaining FFM and RMR seems desirable for long term effective weight loss programmes, due to alterations in respiring tissues that use up considerable amount of energy (Stiegler & Cunliffe 2006).

## 5.9 BODY IMAGE PERCEPTION

The hypothesis that the nurses would incorrectly perceive their body image was accepted as many underestimated their body size, therefore believing they were thinner than they actually were. According to our knowledge, this is the first study that investigated body image perception amongst black female nurses in SA.

Although in general, the nurses were obese class I (BMI-32.1 kg/m<sup>2</sup>), they perceived themselves to be overweight (BMI-28.2 kg/m<sup>2</sup>). Out of the 88.7% overweight/obese nurses, 69.6% underestimated their body image mostly by one shape. This was similar to the findings of Puoane *et al* (2005b), who found that two thirds of SA overweight

black CHWs did not perceive themselves as being overweight, when 95.0% were actually overweight/obese.

Skaal & Pengpid's (2011) study on black SA HCW versus non-HCW demonstrated that 73.6% of those overweight and 57.3% of those obese perceived themselves as being of normal weight. Despite education, both CHWs and HCWs were unable to perceive their body image correctly. This study demonstrated that being educated HCW did not prevent the nurses from incorrectly perceiving their body image.

Body image misconception has been reported amongst the general SA population. Devanathan *et al* (2013) conducted a cross-sectional exploratory study on 328 urban black women in Durban, where the prevalence of overweight was 16.0% and obesity was 76.0%. Fifty-two percent perceived themselves as overweight when only 16.0% had a BMI within the overweight category. Only 27.0% perceived themselves as obese when 76.0% were truly obese. Fourteen percent perceived themselves as normal weight when in fact only eight percent were in the normal weight category.

The results of this study agreed with those of Monteagudo, Dijkstra & Visser (2015), Boo (2014) and Lawlor, Taylor, Bedford & Ebrahim (2002), who found that older women with a higher BMI were more likely to underestimate their body weight. Nurses who grew up in a rural area as well those who grew up in an urban area incorrectly perceived their body image. It was expected that nurses who grew up in urban areas would be more likely to correctly perceive their body image since results from the first International Body Project demonstrated that in SA, 105 rural participants residing in KZN selected significantly larger ideal body sizes compared to 100 urban participants in Cape Town (Swami *et al* 2010).

These results demonstrated that the nurses incorrectly perceived their body image which could be one of the underlying factors causing the high prevalence of overweight and obesity within the profession. According to Skaal & Pengpid (2011), black SA women considered being overweight as beautiful and attractive, which resulted in overweight women viewing themselves as being normal weight and healthy. Being educated did not overcome this misconception. According to Boo (2014),

misconception of body weight poses a barrier to the prevention and treatment of obesity.

Health promotion strategies in SA need to find effective means to address misconceptions regarding perceived weight status as well as to emphasize the health risks of being overweight/obese (Prinsloo *et al* 2011), as traditional education has been ineffective.

#### 5.10 BODY IMAGE SATISFACTION

The hypothesis that the nurses would be happy with their current body shape was rejected because just over half were dissatisfied. Body image dissatisfaction was not expected since the nurses strongly saw themselves as role models in the community and yet were unhappy with their shape. As their definition of being a role model was not investigated, perhaps the nurses' perceived issues other than body weight to be more important where role modeling was concerned.

Of those who wanted to be a different shape (57.0%), the majority (94.3%) wanted to lose weight. Over half (59.3%) had tried to lose weight mostly by exercising (74.2%) and cutting down on junk food (66.3%). Of these, 44.9% stated that they were successful/extremely successful at weight loss, but the study did not determine their definition of successful, the extent of weight loss and for what period of time the weight loss had been maintained. As the majority wanted to reduce weight by two body shapes on the Stunkard FRS, they would still be overweight or may be normal weight by the WHO standards. This would, however, improve their health profile as according to Blackburn & Read (1984), a ten percent reduction in excess body weight can result in lower prevalence of hypertension and may result in type II diabetes mellitus patients reducing their need for oral hypoglycaemic agents. It was observed that modest weight losses can reduce the risk of developing diabetes and produce improvements in sleep apnea, kidney disease, urinary incontinence, depression, number of hospitalizations and use of medications (Olson, Bond & Wing 2017).

The desire to reduce weight and the attempts to do so were reported in earlier studies (Prinsloo *et al* 2011; Puoane *et al* 2005b). In the current study, 53.6% wanted to reduce weight while 59.3% had attempted to do so. This was higher than that reported by Puoane *et al* (2005b) where 54.8% attempted to reduce weight by reducing their food intake, taking slimming tablets or doing exercise and 22.1% attempted to reduce weight through diet and exercise (Prinsloo *et al* 2011). This indicates a positive change in attitude.

Although the CHWs in Cape Town respected a moderately obese woman, they also desired to lose weight (although they definitely did not want to be thin), because an obese body was heavy to carry, causing continuous fatigue (Puoane *et al* 2005b).

#### 5.11 CULTURAL BELIEFS AND BODY IMAGE

The hypothesis that the nurses would be strongly influenced by cultural beliefs was partly accepted because a possible shift in attitude was observed where a healthy body shape was now identified with that of a normal BMI.

The majority (90.1%) associated a normal weight with health and associated obesity with being the unhealthiest. It was expected that nurses would associate overweight with health since earlier research had shown that within the black culture, a moderately overweight woman (27.0 kg/m<sup>2</sup>) indicated good health (Puoane *et al* 2005b; Mvo *et al* 1999). This shift in attitude was positive as an acceptance that overweight and obesity was unhealthy could motivate the nurses to reduce weight.

Both overweight (134.8%)<sup>12</sup> and obesity (123.7%) were solely associated with obese body shapes, which demonstrated that the nurses could not discern between overweight and obesity. This raises concerns about whether the nurses were able to identify overweight patients and advise them accordingly before they became obese.

Thinness was appropriately associated with weakness (84.9%), hard times/poverty (77.6%) and sickness. This was similar to the findings of Okop *et al* (2016); Matoti-

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<sup>12</sup> Nurses could choose more than one body shape from the Stunkard FRS which resulted in percent that totaled over 100%.

Mvalo & Puoane (2011); Puoane *et al* (2005b) and Mvo *et al* (1999), where SA black women correlated thinness with sickness, poverty, unhappiness and stress. Thinness, however, was inappropriately associated with HIV/AIDS (84.2%). These findings were similar to the study by Matoti-Mvalo & Puoane (2011) conducted in Cape Town, where 69.3% of black women associated thinness with HIV/AIDS. Despite the increasing awareness of the negative health consequences of being overweight, many black women preferred to be big as being thin was associated with HIV/AIDS (Matoti-Mvalo & Puoane 2011; Puoane *et al* 2005b; Mvo *et al* 1999). Historically, weight loss has been recognized as a significant prognostic factor in HIV infection (Koethe & Heimbürger 2010) to the extent that it has shaped cultural beliefs in SA. Studies both internationally (Delpierre, Bonnet, Marion-Latard, Aquilina, Obadia, Marchou, Massip, Perret & Bernard 2007; Lazanas, Lambrinouadaki, Douskas, Tsekis, Chini & Georgiou 2003) and in SA (Biggs & Spooner 2017; Devanathan *et al* 2013; Malaza *et al* 2012), have clearly demonstrated that the prevalence of overweight/obesity in asymptomatic HIV infected individuals mirrors that of the general population of the country in which they reside. Wasting is no longer an inevitable consequence of HIV, particularly with the accessibility of antiretrovirals to all in SA who test positive for HIV (Hurley *et al* 2011). This misconception should therefore be addressed as priority using media such as TV as this tool is already being used in SA to educate the population about HIV/AIDS testing and the prevention and precautions (Kaiser Family Foundation & South African Broadcasting Corporation 2007). Education regarding body image should also target black men as well, as some overweight black women mentioned that their significant partners complimented their body size and the positive feedback regarding their attractiveness made them happy and therefore content with their body shape (Mvo *et al* 1999).

Despite health being associated with a normal body weight, interestingly the most desirable body shapes in their culture (65.8%) and the most preferred by men in their culture (69.8%) was overweight. This concurred with Puoane *et al* (2005b) who stated that an overweight black woman (BMI 27.0 kg/m<sup>2</sup>) in SA was culturally preferred, since this was associated with dignity, respect, confidence, beauty and wealth. Since being overweight was the most desirable, it was surprising that the prevalence of obesity was

so high and perhaps explained the desire to lose weight from an obese shape to an overweight shape amongst the nurses in this study.

The high prevalence of obesity, however, could be explained by the association of wealth (75.0%) with obesity in the current study. Puoane *et al* (2002) reported that being an obese black woman shows society the ability of a husband to care for his wife and his family. The current study, however found a poor association with wealth and being overweight, which was in contrast to the findings of Okop *et al* (2016), where an overweight woman was considered wealthy as she was able to “eat nicely” and therefore could afford to “eat a lot”. Being overweight or obese also indicated the availability of a sufficient food supply and intake, as food was associated with pleasure and comfort in areas where there was a high prevalence of food insecurity (Mvo *et al* 1999).

Both normal weight and overweight was associated with strength (50.6%, 59.2%) and the ability to bear children (91.4%, 75.6%). No previous studies have shown any association of normal weight with strength and the ability to bear children; again, demonstrating a shift in attitude amongst black SA women. According to the ‘Big is Beautiful’ study conducted in Cape Town, an overweight woman was regarded as someone who is round, and should be able to do any work required of her such as cooking a big pot of food without getting easily blown away by the wind (Puoane *et al* 2005b). Young black women believed that being overweight represented fertility and the ability to bear children (Salamon & Juhasz 2011).

Cultural beliefs may therefore lead to conflicting desires regarding optimum body shape. To be healthy one needs to be a normal weight, but to be desirable one needs to be overweight and to demonstrate success and affluence one needs need to be obese.

## 5.12 INFLUENCES OVERPOWERING CULTURE

Even though cultural beliefs had a strong influence on the nurses in the current study, there seemed to be a shift in attitude possibly due to the influences of media (Puoane *et al* 2005b) or the family.



### 5.12.1 Media

The hypotheses that the nurses would be influenced by the media to lose weight, and that media would overpower culture, were accepted.

Only 16.0% were undecided regarding the impact of media while just over half (57.4%) believed that media had a bigger influence on their body shape than cultural beliefs in contrast to the one fifth (26.6%), who disagreed. These findings were similar to that found in the Bloemfontein study where 58.0% were influenced either negatively or positively by the images in magazines, while the remaining 42.0% were either self-confident or were not influenced by magazines (Prinsloo *et al* 2011).

In the current study, the overall biggest media influence was TV, although the older nurses were more influenced by the radio and the newspaper, while the younger nurses were more influenced by social media such as Facebook and Instagram. This was expected as the younger generation are more accustomed to these forms of social media and have better access to internet (Lenhart, Purcell, Smith & Zickuhr 2010; Quan-Haase & Young 2010). Although the influence of the various types of media was primarily not related to the area where the nurses were raised, those from rural areas were significantly more influenced by radio. Radio and TV are the most common source of nutrition information for the urban black SA women (Van Der Merwe & Pepper 2006). Although overall TV was the most influential, the government could take advantage of these preferences and strategise the use of different forms of media to impact different target audiences. This could include the use of radio to focus campaigns on weight loss in rural areas.

In the current study, some (38.1%) felt more connected with the media than their cultural beliefs, since the media promoted healthy lifestyles and the consequences of being fat. The media in general always portrayed thin women as being beautiful and overweight or obese people as being unhealthy with low esteem and confidence.

The first International Body Project reported that in SA, women from rural areas who were less exposed to western media, preferred heavier bodies, whereas those from urban areas who were more exposed to western media, preferred a thinner figure

(Swami *et al* 2010). Over the years, as the economy has improved, media influences have extended further into disadvantaged areas causing black SA women to become increasingly exposed to conflicting body size ideals of other cultures (Micklesfield *et al* 2013). Media promotion of the Western body ideals as thinness for women has caused an increasing number of young SA females to report dissatisfaction with their bodies (Szabo & Allwood 2006).

According to Edwards *et al* (2003), in SA all women, intentionally or unintentionally competed with the media and each other to increase their sense of self-worth and social acceptability.

#### 5.12.2 Family Beliefs

The hypothesis that the nurses would be influenced by family beliefs to lose weight was partly accepted since only half agreed that their family had a stronger influence on their shape than cultural beliefs, which indicated conflicting ideals.

According to Puoane *et al* (2006), society, families and communities influence beliefs concerning body weight. Some (32.7%) disagreed that family beliefs had any influence, while 16.0% were neutral and felt that family beliefs did not influence their body image at all.

Of those who agreed (51.4%) that family beliefs have a greater influence than culture, the opinion of their partner was the most influential factor, followed closely by the opinions of the women (mother/sister/grandmother) in the family. Other men in their family (brother/father/grandfather) did not have any influence. According to Mvo *et al* (1999), some overweight black women mentioned that when their significant partners complimented their body size, they would be happy and feel content with their body. Even though this study has shown that culturally men preferred an overweight woman, it also demonstrated that some men encouraged their significant partners to lose weight, thus showing that even though family members had an influence on how a black woman feels about her body image, some of them did not conform to the ideals of culture. Besides their partner, some (39.7%) agreed that their children influenced the way they

felt about their body shape by encouraging them to eat healthily and lose weight. This could be due to the impact of health education at school promoting obesity preventative strategies and hence influencing children.

This new shift in attitude away from cultural beliefs could be due to the influence of media. According to our knowledge, family beliefs had not been investigated in any previous studies regarding body image perception and these findings could add essential information to literature. In addition to factors such as body image perception, the influence of media and family beliefs, it was also essential to investigate factors that were barriers to body weight control amongst nurses.

### 5.13 BARRIERS TO BODY WEIGHT CONTROL AMONGST NURSES

Working different/long shift hours, being too tired to exercise or to prepare balanced meals and fast food being an easier option, were the main factors that made it difficult for the nurses to control their weight. Similar findings were observed by Han *et al* (2011) who stated that adverse work schedules could lead to obesity amongst nurses as shift work or long working hours may disrupt normal eating hours and reduce access to healthy food options. Nurses working night shifts tend to eat unhealthy foods high in salt and sugar, and have reported that their working hours affect their energy levels and frequency of exercise (Han *et al* 2011; Trinkoff *et al* 2001). Twelve focus group discussions were conducted in the Western Cape, SA, including 103 nurses mentioned that there was a lack of time to prepare healthy meals due to long working hours and shift work and being overtired from work (Phiri *et al* 2014). An understanding of all these concerns is important to plan suitable diet and lifestyle-related interventions for nurses to promote optimum health and prevent overweight and obesity (Shipra Gupta 2016).

## 5.14 CONCLUSION

Many were satisfied with their career choice and most were apparently healthy. Despite the high prevalence in SA, there was a very low prevalence of both NCDs and HIV/AIDS amongst the nurses, which could have been due to underreporting or unawareness of existing conditions. Very few either had conditions or were taking medications that could cause weight gain. According to their mean BMI, they were classified as obese class I with a higher BMI than that reported previously in nurses and in the general black female population in SA. Conventional health education and training in nursing therefore had not encouraged the adoption of healthy lifestyle behaviours.

There was a high prevalence of overweight and obesity amongst the nurses, which was higher than previous studies involving SA nurses and substantially higher than that found internationally. The prevalence was higher than that of the general black SA female population, indicating that overweight and obesity is as prevalent within the nursing profession as in the general population. The nurses also had high body fat levels. Although not all the nurses were under lean yet, some needed to do exercise to help them to further increase their FFM.

Despite being educated HCWs, the nurses still incorrectly perceived their body image by assuming they were of normal weight or overweight, when they were in fact overweight or obese. They also could not differentiate between overweight and obese shapes which could be a contributing factor for incorrectly perceiving their own body shape. This was similar to other HCWs and CHWs and the general population in SA. This could be one of the underlying factors causing the high prevalence of overweight and obesity within the profession since they could not identify that they were overfat.

The nurses strongly considered themselves as role models in the community but since overweight and obesity were as prevalent within the profession as it is in the general black SA female population, they were not actually role models. Despite considering themselves as role models, more than half were not satisfied with their body image and wanted to lose weight by one or two shapes on the Stunkard FRS. Although this would not be a normal BMI, losing weight would still be beneficial to the health. Over half had

tried to reduce weight by exercising and cutting down on junk food. This shift in attitude could be due to the media and it is important to be addressed by the Government via targeted media campaigns as this could be helpful to reduce the prevalence of overweight and obesity.

There has been a change in cultural beliefs as health was associated with normal BMI body shapes, unlike in previous studies that associated health with overweight shapes. An underweight woman was correctly perceived as being weak, poor or sick, however, being underweight was incorrectly associated with HIV/AIDS. A high prevalence of overweight and obesity similar to that of the general population in SA has been observed amongst HIV infected people. It is essential to educate the nurses as well as the general population as changing this perception could influence overweight/obese women to consider losing weight and no longer fear the stigma associated with HIV/AIDS, thus reducing the obesity epidemic. An overweight woman was perceived to be most desirable by their culture which was similar to the findings of other studies on the black culture in SA. Obesity (not overweight) was associated with affluence because culturally this shows society the ability of a husband to care for his wife and family, as well as the availability of sufficient food supply and intake. While the ability to bear children and strength were previously associated with being overweight, in the current study, they were associated with normal weight and overweight, as well which also indicates a shift in perception regarding body image.

Cultural beliefs therefore led to conflicting desires regarding the nurse's ideal body shape since to be healthy they needed to be a normal weight, but to be culturally desirable they needed to be overweight and obesity seemed to demonstrate affluence and success.

Media, primarily TV was observed to be highly influential in the way the nurses felt about their body image. The media could therefore be used as mediums for intervention programs for different age groups as the older nurses were more influenced by radio and newspapers, while the younger ones were more influenced by Facebook and Instagram as they reported that media did influence them to lose weight. Since media has been observed to be influential, it could be used as a medium for health

education and to address the misconceptions regarding body image which could influence them to lose weight. The nurses were also influenced by family members who made them feel differently about their body image by influencing them to lose weight. The most influential was their partner followed by women in their families, but it was also observed that their children encouraged them to eat healthier and to lose weight. The nurses also stated that working different/long shift hours, being too tired to exercise or to prepare a proper balanced meal and fast food being an easier option, were barriers for them to being able to control their weight. It is therefore essential to carefully consider all the factors that are promoting a high prevalence of overweight and obesity amongst the black SA female nurses, to be able to implement culturally sensitive weight loss strategies.

## **CHAPTER 6: CONCLUSION AND RECOMMENDATIONS**

### **6.1 INTRODUCTION**

The following objectives were investigated amongst black female nurses practising in a private hospital in Durban, KZN, SA.

- 6.1.1 To determine the prevalence of overweight and obesity.
- 6.1.2 To determine their body fat percentage and FFM.
- 6.1.3 To determine how they perceived their body image.
- 6.1.4 To determine whether they were satisfied with their body shape.
- 6.1.5 To determine whether their cultural beliefs influenced their body image perception.
- 6.1.6 To determine whether they were influenced by media to lose weight and whether the influence of media overpowered their cultural beliefs.
- 6.1.7 To determine whether family beliefs influenced the way they felt about their body image.
- 6.1.8 To determine which factors were barriers to their body weight control.

This chapter concludes and critiques the study and gives recommendations followed by implications for further research.

### **6.1 CONCLUSIONS OF THE STUDY**

The rising obesity epidemic in SA is a major public health problem as obesity is a significant risk factor for NCDs, which in turn are the leading group causes of death in SA. Understanding the factors which contribute to obesity in SA is important to develop appropriate intervention strategies. Unique socio-cultural factors amongst the black culture play a critical role regarding body image in SA, an understanding of which would help manage this epidemic. In general, it has been shown that black SA women favour being overweight as this represents respect, strength, beauty, wealth and health and disdain thinness which is associated with HIV/AIDS, sickness, poverty and depression.

Black SA women also tend to underestimate their body weight by assuming they are thinner than they actually are, which could mask their ability to self-diagnose overweight/obesity and thus impact the obesity epidemic. As much of the research has been done on the general black population, it was important to investigate if nurses, who as part of their qualifications were educated on the consequences of overweight/obesity, had adopted healthy behaviours and therefore demonstrated a lower prevalence of overweight/obesity and whether they would be able to correctly identify their body shape.

The prevalence of overweight and obesity amongst the nurses followed that of the general SA black female population indicating that traditional methods of education as part of their training, had not encouraged them to adopt healthy behaviours. When the results of this study were compared to nurses internationally, SA is facing an even bigger problem because the prevalence of overweight and obesity amongst nurses was far higher in SA. The nurses were overfat with a high body fat percentage and many had a normal FFM. Although they did not need to improve their FFM, exercising would further increase their lean mass that would in turn increase their RMR, therefore aiding weight loss/maintenance by burning additional energy. Despite the FFM being in the normal range, almost a third were underlean and needed to exercise to increase their FFM.

Many, particularly the older nurses, perceived their body image incorrectly and believed that they were thinner than they actually were, a misconception which could be a barrier to weight loss management. Despite being educated, they were unable to discern between overweight and obese shapes which raised the question as to whether the nurses would therefore be able to identify and therefore help overweight patients. An intervention strategy would be to educate the nurses on how to identify overweight and obesity in themselves and in their patients. The nurses would, however, still need to desire to correct their body weight.

Many were dissatisfied with their body shape, as approximately half wanted to be thinner by at least one/two body shapes. This shift in attitude is particularly important for weight loss campaigns and strategies to be successful. Although they would remain



in the overweight category, decreasing their weight by one/two body shapes would positively impact their health profile and conceivably reduce the prevalence of NCDs and other related health issues.

Although culture still played an important role, some cultural beliefs appeared to have shifted as this study identified that black SA nurses associated normal BMI body shapes with health, whereas previous studies had associated health with overweight. In contrast to previous research, normal body shapes were also associated with the ability to bear children and strength. Obesity remained a demonstration of wealth however and thinness a representation of HIV/AIDS. Despite recent studies demonstrating that the prevalence of overweight/obesity amongst those with asymptomatic HIV mirrors that of the general black female population in SA, the majority still associated thinness with HIV/AIDS. A few however did associate normal/overweight/obese shapes with HIV/AIDS which may indicate that the belief is beginning to shift. This particular misconception needs to be urgently addressed to eliminate the commonly used excuse for weight loss being unacceptable in black South Africans.

The apparent shifting in cultural beliefs towards desiring to be less overweight/obese could be due to the influence of either or both media and family beliefs, as approximately half felt these were overpowering their cultural beliefs and motivated them to lose weight. While TV was the main influential source of media, the older nurses were more influenced by the radio and newspaper and the younger ones by Facebook and Instagram. This implies that different sources of media should be considered for different age groups when designing weight loss intervention strategies. Regarding family beliefs, the most influential factor was their significant partners followed by women in their families. It was also observed that children played a role in the way nurses felt about their body image and this could be the impact of health education at school which promotes obesity-preventative strategies. Health education directed at children could highly influence their parents and therefore the weight of the nation.

Nurses work in an obesogenic environment and profession and barriers to body weight control amongst them included being too tired to prepare a proper meal and to exercise

due to long working hours/shift work which caused them to choose fast food as an easier option. Over half had attempted to reduce weight by exercising and cutting out junk food.

Despite being health ambassadors to the public, these nurses were instead contributing towards the obesity epidemic. It is therefore imperative to understand the cultural influences on body image perception and the impact of various types of media and family beliefs. This will enable the implementation of effective culturally sensitive obesity-preventative strategies to combat the obesity epidemic in SA.

### 6.3 STUDY CONSTRAINTS/LIMITATIONS

6.3.1 Medical conditions were self-reported and may have been under reported or there may have been underlying conditions unknown to the nurses.

6.3.2 Since this study was conducted in one private hospital in KZN, the sample may not be representative of all the black female nurses in SA.

6.3.3 Seventy-three nurses refused to participate as half felt that the study was racial as it was directed at black nursing staff, some were too busy to leave their wards, some said they would not be able to comply with the fasting criteria, while others were pregnant.

### 6.4 RECOMMENDATIONS FOR IMPROVEMENT OF THE STUDY

6.4.1 As the nurses claimed to have been successful losing weight and yet remained overweight and obese, the understanding of successful weight loss needs to be investigated as well as for how long the weight loss was maintained.

6.4.2 The sample size could have been expanded to different provinces to represent cultures other than the Zulu and Xhosa cultures.

6.4.3 Underestimation of body size can be analyzed respective to BMI category to demonstrate how many obese nurses perceived themselves as

overweight/normal or how many overweight nurses perceived themselves as normal.

## 6.5 RECOMMENDATIONS FOR NUTRITION PRACTICE

6.5.1 The Government can use the media (TV, radio and social media such as Facebook) as a direct channel to provide nutrition education for different age groups as they are preferred and reliable sources of information which are accessible. For example, the misconception that only thin people are infected with HIV/AIDS needs to be addressed at a national level.

## 6.6 IMPLICATIONS FOR FURTHER RESEARCH

6.6.1 This study could be repeated in both state and private hospitals from different provinces for a larger sample size to be more representative of the prevalence of overweight/obesity amongst black female nurses.

6.6.2 Different media platforms should be used to address body image misconceptions and hence the prevalence of overweight and obesity amongst different age groups could be monitored.

6.6.3 Future studies should conduct focus group discussions with nurses regarding the factors that are barriers to them being unable to control their weight, intervene in the environment to address these and monitor the impact on weight loss and the prevalence of overweight/obesity.

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### DATA COLLECTION FORM

1. Code:
2. Name and surname: .....
3. Identity (ID) Number: .....
4. Age: .....
5. Ward: .....

6. Have you done any exercise in the past 12 hours?  
 Yes  No

7. Did you drink any alcoholic drinks in the past 24 hours?  
 Yes  No

8. Did you have any caffeinated drinks (tea, coffee, energy drinks) in the past 4 hours?  
 Yes  No

9. How many hours has it been since you last ate?  
 .....

Referring to the figure scale,

10. In your opinion, which shape represents you the best? .....

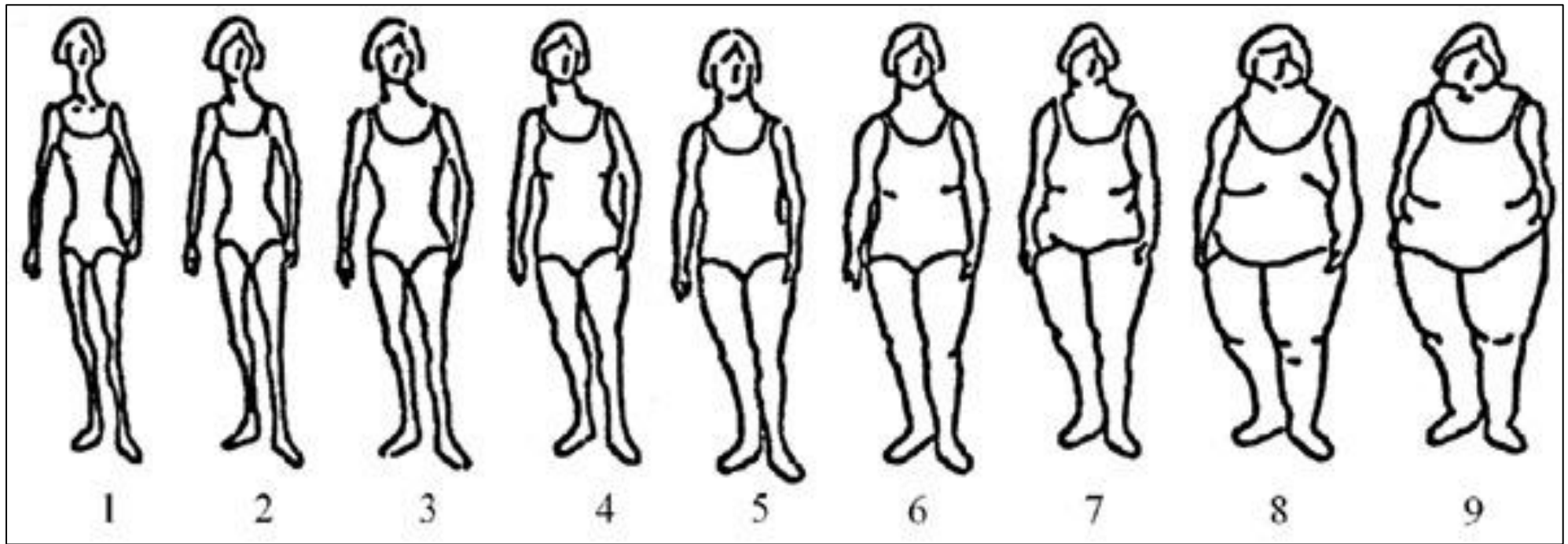
11. Would you like to be a different shape?  
 Yes  No

12. If yes, which shape would you like to look like?.....

13. Indicate your agreement on how important is it for you to be a different shape?

Not important at all	Not important	Neutral	Important	Very important
----------------------	---------------	---------	-----------	----------------

- |                           |                                                         |                                                         |                                                         |
|---------------------------|---------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|
| 11. Weight:               | <input style="width: 100%; height: 20px;" type="text"/> | <input style="width: 100%; height: 20px;" type="text"/> | <input style="width: 100%; height: 20px;" type="text"/> |
| 12. Height:               | <input style="width: 100%; height: 20px;" type="text"/> | <input style="width: 100%; height: 20px;" type="text"/> | <input style="width: 100%; height: 20px;" type="text"/> |
| 13. Quadscan test number: | <input style="width: 100%; height: 20px;" type="text"/> | <input style="width: 100%; height: 20px;" type="text"/> |                                                         |



APPENDIX B: Questionnaire

This confidential questionnaire consists of 6 pages - please answer all the questions.

**SECTION A**

1. Name and Surname

Code



2. What culture are you?

- Zulu   
  Xhosa   
  Sotho   
  Tswana   
  Sepedi   
  Tsonga  
 Ndebele   
  Swati   
  Venda   
  Other

If other, please specify.

3. What type of area did you grow up in?

- Urban                     
  Rural                     
  Suburban                     
  Other

If other, please specify.

4. What qualification(s) do you have? Tick **ALL** that apply.

4.1	Bachelor's Degree in Nursing and Midwifery		4.7	Nursing Bridging course	
4.2	Diploma in Nursing and Midwifery		4.8	Nursing management	
4.3	Advanced Diploma in Midwifery		4.9	Community Nursing	
4.4	Primary Health Care		4.10	Ancillary Health Care/ Auxiliary Nursing	
4.5	Diploma in Nursing: Staff Nurse		4.11	Postgraduate programs	
4.6	Bachelor of Nursing Advance Practice		4.12	Other	

If other, please specify.

5. How many years of nursing experience do you have?

6. Indicate your level of satisfaction with your current career choice

Very dissatisfied	Dissatisfied	Slightly dissatisfied	Slightly satisfied	Satisfied	Very satisfied
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7. Being a nurse, do you see yourself as a role model in the community?

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
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**SECTION B**

These questions have been designed to see if you have any condition or taking any medication that could be influencing your weight.

8. Have you been diagnosed with any of the following medical conditions? Tick **ALL** that apply.

8.1	High blood pressure		8.7	TB	
8.2	High cholesterol		8.8	Diabetes	
8.3	Chronic Obstructive Pulmonary Disease		8.9	Cardiovascular Diseases	
8.4	Polycystic Ovarian Syndrome (PCOS)		8.10	Hypothyroidism	
8.5	HIV/AIDS		8.11	Cushing's Syndrome	
8.6	Insulin Resistance		8.12	Other	

If other, please specify.

9. Please write down the name of all the medications you are currently taking including contraceptive and hormone replacement therapy. Examples include Metformin, Actraphane, Tenofovir, Emtricitabine and Efavirenz.

**SECTION C**

These questions have been designed to see how media influences your body shape and perceptions.

10. Indicate your agreement that the following types of media influence your body shape. Please choose only one answer for each type of media.

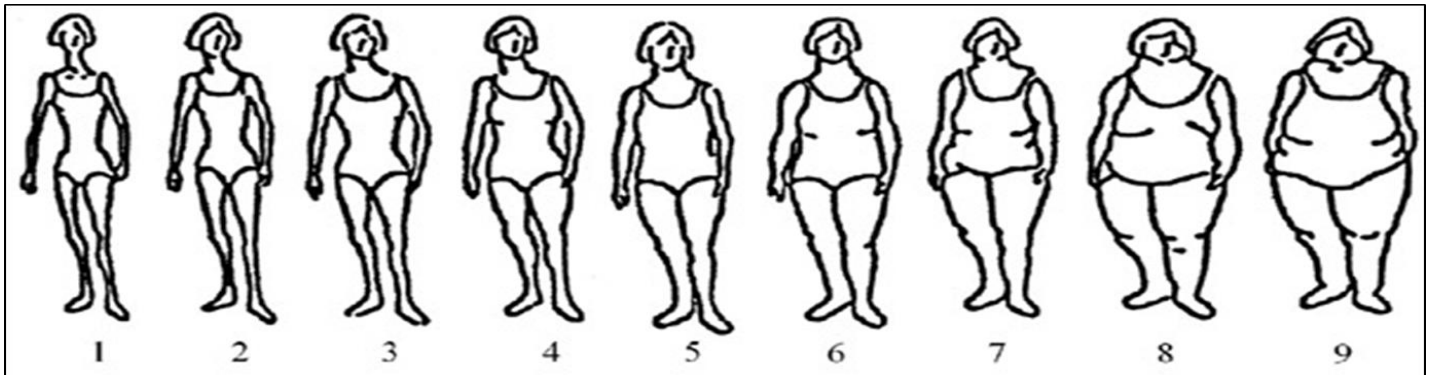
	Media	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
10.1	Movies					
10.2	Magazines					
10.3	TV programs					
10.4	Radio					
10.5	Newspapers					
10.6	Advertisements					
10.7	Facebook					
10.8	Instagram					

11. Indicate your agreement that the media influences you to have...

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
11.1	... a larger body size					
11.2	... a smaller body size					

**SECTION D**

12. Please refer to the body shape pictures below when answering the following questions. Select the body shape that applies to each of the following items. If necessary you can select more than one body shape.



	ITEMS	1	2	3	4	5	6	7	8	9	None of these
12.1	The most healthy										
12.2	The most unhealthy										
12.3	Overweight										
12.4	Obese										
12.5	Thin										
12.6	The most desirable in your culture										
12.7	Most preferred by men of my culture										
12.8	Associated with HIV/AIDS or TB										
12.9	Associated with being weak										
12.10	Associated with being strong										
12.11	Associated with being able to bear children										
12.12	Associated with hard times or being poor										
12.13	Associated with wealth										
12.14	Most desirable in your family										

**SECTION E**

13. Indicate your agreement that the following influence the way **you** feel about your body shape:

	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
13.1	Family beliefs					
13.2	Men in your family					
13.3	Your partner (husband/boyfriend)					
13.4	Women in your family					
13.5	Your children					
13.6	Women in your community					
13.7	Cultural beliefs					

14. Based on your previous answers, how do these factors influence the way you feel about your body shape?

15. Indicate your agreement that the media has a bigger influence on your body shape than your cultural beliefs.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
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16. Please explain why you think this way.

17. Indicate your agreement that your family has a bigger influence on your shape than your cultural beliefs.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
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**SECTION F**

18. Have you ever tried to reduce your weight?

Yes

No

**If you answered NO to question 18 above, proceed to the end. You are finished. Thank you for your time.**

**If you answered YES to question 18 above, please answer the following questions.**

19. Indicate which of the following options you have used to try and reduce your weight. (Tick **ALL** that apply)

19.1	Trying different diets		19.6	Cutting down on sweetened beverages	
19.2	Diet pills		19.7	Choosing food higher in fibre	
19.3	Exercise		19.8	Weight loss surgery	
19.4	Decreasing portion size		19.9	Fasting	
19.5	Cutting down on junk food		19.10	Other	

20. If other, please specify.

21. Rate from 1 to 5 how successful you were at losing weight, where 1 = not at all successful and 5 = extremely successful

Not at all successful 1	2	3	4	Extremely successful 5

22. Indicate your agreement that the following factors are barriers to you being able to control your weight.

	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
22.1	Lack of motivation to make lifestyle changes					
22.2	Working different shift hours					
22.3	Too tired to exercise					
22.4	Too tired to prepare a proper balanced meal					
22.5	Cultural beliefs					
22.6	Too tired to cook					
22.7	Fast food is an easier option					

**Thank you for giving of your time to complete this questionnaire**

INFORMATION AND INFORMED CONSENT FORM
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**TITLE OF RESEARCH PROJECT:**

Prevalence of overweight and obesity and body image perception amongst black South African female nurses practicing in Durban, KwaZulu-Natal, South Africa.

**PRINCIPLE INVESTIGATOR:**

Yovenita Ramgolam, MSc Candidate, PG Dip, BSc Dietetics (UKZN), Department of Dietetics and Human Nutrition, University of KwaZulu-Natal

Cell: 0714805816, e-mail: [yovenita30@gmail.com](mailto:yovenita30@gmail.com)

**SUPERVISOR**

Dr Chara Biggs, Department of Dietetics and Human Nutrition, University of KwaZulu-Natal Cell: 0814877950, email: [biggsc@ukzn.ac.za](mailto:biggsc@ukzn.ac.za)

You are invited to consider participating in a research project being conducted by the Department of Dietetics, University of KwaZulu-Natal as part of an MSc thesis that is investigating body image perception. We want to find out about how you feel about your body, what you believe about your appearance and what factors influence the way you perceive your body image.

Exclusion criteria

Please kindly do not participate in this study if you are a male nurse, are pregnant, have been diagnosed with renal failure, have oedema, have pacemakers, have artificial limbs, are of a different ethnicity other than black South African or if you have been brought up following a different culture such as the White or Indian culture.

Who has been invited to participate?

All the black female nurses practicing at St Augustine's Hospital are eligible to participate in this study but a random selection was done for a specific sample size.

Why have you been invited to participate?

We feel that black female nurse practitioners are educated health professionals who will provide us with valuable information regarding body image perception within the culture and the factors and beliefs that influence it.

### What procedures will be involved in this research?

The procedures involved are simple, do not hurt and are not harmful in any way. Since we want the measurements to be as accurate as possible, we cannot take them directly after you have eaten, e.g. after lunch or after tea/snack. To be eligible to participate in this study, participants must refrain from:

- Exercising 12 hours prior the tests
- Consuming alcoholic drinks 24 hours prior the tests
- Consuming caffeinated drinks (tea, coffee, energy drinks) 4 hours prior the tests
- Eating (breakfast, snacks, full meals) 4 hours prior the tests

Weight will be taken in minimal clothing. Thereafter, height will be taken, followed by a quick, non-invasive full body composition analysis involving the latest and most accurate technology which will provide accurate measurements. It should take us a total of 15 minutes to do all the measurements. We will then give you a questionnaire to complete in your own time (where there are no right or wrong answers) and arrange a time to fetch it. Participation in this research is voluntary and you have the right to withdraw from the study at any given time without any negative or undesirable consequences to yourself.

### Will you receive any money or gifts for taking part in the study?

There will be a lucky draw for the amount of R1000 for every 50 successful participants at the end of the data collection. Incomplete questionnaires will be discarded and will not be considered for the lucky draw. You will also receive a full body composition analysis which will give you a very accurate breakdown of your fat and muscle mass as well as an explanation from a qualified dietician on the implications.

### **ETHICS:**

The research project has been approved by the Biomedical Research Ethics Committee (BREC) (BREC ref number: BE286/17) of UKZN and Netcare Research Operations Committee (UNIV-2017-0026). If you have any questions about the research that you feel that the researchers have not satisfactory dealt with, the contact details for BREC are as follows:

#### **BIOMEDICAL RESEARCH ETHICS ADMINISTRATION**

Research Office, Westville Campus, Govan Mbeki Building, University of KwaZulu-Natal, Private Bag X 54001, Durban, 4000, KwaZulu-Natal, South Africa.

Tel: +27 31 2602486, Fax: +27 31 2604609, e-mail: BREC@ukzn.ac.za

To protect your confidentiality, the results of the measurements and answers to the questionnaires will be entered into a database using a code and not your name. Once the data is entered, the questionnaires and forms will be destroyed and the data will remain confidential to the supervisor and principle investigator. Every effort will be made to keep personal information confidential. However, absolute confidentiality cannot be guaranteed. Personal information may be disclosed if required by law.

Organizations that may inspect and/or copy your research records for quality assurance and data analysis include groups such as the Research Ethics Committee, Data Safety Monitoring Committee and the Medicines Control Council (where appropriate). Data collected will be used to obtain a MSc Dietetics qualification and will be published in a scientific journal.

By signing below, I ..... agree to participate in this study entitled: Prevalence of overweight and obesity and body image perception amongst qualified black South African female nurses practicing in Durban, KwaZulu-Natal, South Africa.

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am comfortable. I have had a chance to ask questions and all my questions have been adequately answered.

- I understand that taking part in this study is voluntary and I have the right to withdraw from this study at any given time without any negative or undesirable consequences to myself.

Signed ..... at (place)

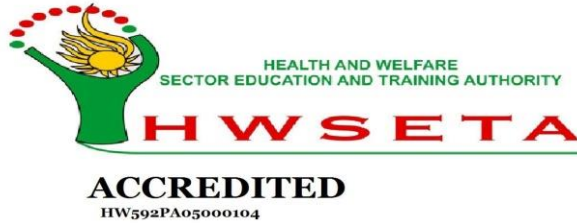
..... on (date) .....2017

APPENDIX D: Permission letter from Zimeleni Nursing School

Zimeleni Consulting FET College  
Suite 504 Commercial City  
Commercial Road  
Durban, 4000  
Email: zimeleni@telkomsa.net



P.O BOX 13024  
CASCADES  
3202  
TEL/FAX 031-3014894  
www.zimeleniconsulting.co.za



Ms Yovenita Ramgolam

Email: [yovenita30@gmail.com](mailto:yovenita30@gmail.com)

Dear Yovenita,

**RE: PREVALENCE OF OVERWEIGHT AND OBESITY AND BODY IMAGE PERCEPTION AMONGST QUALIFIED BLACK SOUTH AFRICAN FEMALE NURSES PRACTISING IN DURBAN, KWAZULU-NATAL, SOUTH AFRICA**

The above-mentioned research proposal was reviewed and it is with pleasure that I inform you that your request to conduct a pilot study at Zimeleni Nursing School has been approved, subject to the following:

- i. All information regarding Zimeleni Nursing School will be treated as legally privileged and confidential.
- ii. All legal requirements with regards to participants' rights and confidentiality will be complied with.
- iii. Zimeleni Nursing School reserves the right to withdraw the approval for the pilot study at any time during the process, should the research prove to be detrimental to the subjects/Zimeleni Nursing School or should the researcher not comply with the conditions of approval.

May I wish you all the best for your pilot study.

Yours faithfully,

Mrs Thobile Shelmbe

(Head of Zimeleni Nursing School)



Netcare St Augustine's Hospital

Tel: +27 (0) 31 268 5000  
Fax: +27 (0) 31 201 4598  
107 J.B Marks Road, Durban, 4001, South Africa  
PO Box 30105, Mayville, 4058, South Africa  
www.netcare.co.za

28 February 2017

**LETTER CONFIRMING KNOWLEDGE OF NON-TRIAL RESEARCH TO BE CONDUCTED IN THIS NETCARE FACILITY**

Dear Mandy

**Prevalence of overweight and obesity and body image perception amongst qualified black South African female nurses practising in Durban, KwaZulu-Natal, South Africa.**

We hereby confirm knowledge of the above named research application to be made to the Netcare Research Operations Committee and in principle agree to the research application for Netcare St Augustine's , subject to the following:

1. That the data collection may not commence prior to receipt of FINAL APPROVAL from the Netcare Research Operations Committee.
2. A copy of the research report will be provided to the Netcare Research Operations Committee once it is finally approved by the tertiary institution, or once complete.
3. Netcare has the right to implement any recommendations from the research.
4. That the Hospital/Site/Division Management reserves the right to withdraw the approval for research at any time during the process, should the research prove to be detrimental to the subjects / Netcare or should the researcher not comply with the conditions of approval.

We wish you success in your research.

Yours faithfully

  
**MR HEINRICH VENTER**  
Hospital General Manager

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Netcare Hospitals (Pty) Ltd T/A Netcare St Augustine's Hospital  
Directors: J du Plessis, R H Friedland, K N Gibson, C Grindell, N Phillipson  
Company Secretary: L Bagwandeem  
Reg. No. 1996/006591/07

APPENDIX F: Ethical approval from Biomedical Research Ethics Committee, UKZN



30 June 2017

Ms Y Ramgolam  
Discipline of Dietetics and Human Nutrition  
School of Agriculture, Earth and Environmental Sciences  
[Yovenita30@gmail.com](mailto:Yovenita30@gmail.com)

Dear Ms Y Ramgolam

**Protocol: Prevalence of overweight and obesity and body image perception amongst qualified Black South African female nurses practicing in Durban, KwaZulu-Natal, South Africa.**  
Degree: MSc  
BREC ref: BE286/17

A sub-committee of the Biomedical Research Ethics Committee has considered and noted your application received on 05 May 2017.

The study was provisionally approved pending appropriate responses to queries raised. Your response dated 14 June 2017 to BREC letter dated 25 May 2017 have been noted by a sub-committee of the Biomedical Research Ethics Committee. The conditions have now been met and the study is given **full ethics approval** and may begin as from 30 June 2017.

This approval is valid for one year from **30 June 2017**. To ensure uninterrupted approval of this study beyond the approval expiry date, an application for recertification must be submitted to BREC on the appropriate BREC form 2-3 months before the expiry date.

Any amendments to this study, unless urgently required to ensure safety of participants, must be approved by BREC prior to implementation.

Your acceptance of this approval denotes your compliance with South African National Research Ethics Guidelines (2015), South African National Good Clinical Practice Guidelines (2006) (if applicable) and with UKZN BREC ethics requirements as contained in the UKZN BREC Terms of Reference and Standard Operating Procedures, all available at <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>.

BREC is registered with the South African National Health Research Ethics Council (REC-290408-009). BREC has US Office for Human Research Protections (OHRP) Federal-wide Assurance (FWA 678).

The sub-committee's decision will be **RATIFIED** by a full Committee at its next meeting taking place on 08 August 2017.

We wish you well with this study. We would appreciate receiving copies of all publications arising out of this study.

Yours sincerely

Professor J Tsoka-Gwegweni  
Chair: Biomedical Research Ethics Committee

cc supervisor: [biggsc@ukzn.ac.za](mailto:biggsc@ukzn.ac.za)  
cc postgraduate administrator: [manioom@ukzn.ac.za](mailto:manioom@ukzn.ac.za)

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Biomedical Research Ethics Committee  
Professor J Tsoka-Gwegweni (Chair)  
Westville Campus, Govan Mbeki Building  
Postal Address: Private Bag X54001, Durban 4000

Telephone: +27 (0) 31 260 2486 Facsimile: +27 (0) 31 260 4609 Email: [brec@ukzn.ac.za](mailto:brec@ukzn.ac.za)



Netcare Hospital Management (Pty) Limited

Tel: + 27 (0)11 301 0000  
Fax: Corporate +27 (0)11 301 0499  
76 Maude Street, Corner West Street, Sandton, South Africa  
Private Bag X34, Benmore, 2010, South Africa

**RESEARCH OPERATIONS COMMITTEE FINAL APPROVAL OF RESEARCH**

Approval number: UNIV-2017-0026

Ms Yovenita Ramgolam

E mail: yovenita30@gmail.com

Dear Ms Ramgolam

**RE: PREVALENCE OF OVERWEIGHT AND OBESITY AND BODY IMAGE PERCEPTION AMONGST QUALIFIED BLACK SOUTH AFRICAN FEMALE NURSES PRACTISING IN DURBAN, KWAZULU-NATAL, SOUTH AFRICA**

The above-mentioned research was reviewed by the Netcare Research Operations Committee's delegated members and it is with pleasure that we inform you that your application to conduct this research at Netcare St Augustine's Hospital, has been approved, subject to the following:

- i) Research may now commence with this FINAL APPROVAL from the Netcare Research Operations Committee.
- ii) All information regarding Netcare will be treated as legally privileged and confidential.
- iii) Netcare's name will not be mentioned without written consent from the Netcare Research Operations Committee.
- iv) All legal requirements with regards to participants' rights and confidentiality will be complied with.
- v) Netcare must be furnished with a STATUS REPORT on the progress of the study at least annually on 30th September irrespective of the date of approval from the Netcare Research Operations Committee as well as a FINAL REPORT with reference to intention to publish and probable journals for publication, on completion of the study.
- vi) A copy of the research report will be provided to the Netcare Research Operations Committee once it is finally approved by the relevant primary party or tertiary institution, or once complete or if discontinued for any reason whatsoever prior to the expected completion date.
- vii) Netcare has the right to implement any recommendations from the research.

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Executive Directors: R H Friedland, K N Gibson

Company Secretary: L Bagwandeen

Reg. No. 1992/002177/07



- viii) Netcare reserves the right to withdraw the approval for research at any time during the process, should the research prove to be detrimental to the subjects / Netcare or should the researcher not comply with the conditions of approval.
- ix) APPROVAL IS VALID FOR A PERIOD OF 36 MONTHS FROM DATE OF THIS LETTER OR COMPLETION OR DISCONTINUATION OF THE STUDY, WHICHEVER IS THE FIRST.

We wish you success in your research.

Yours faithfully



1/6/17

Prof Dion du Plessis

Full member: Netcare Research Operations Committee & Medical Practitioner evaluating research applications as per Management and Governance Policy



Shannon Nell

Chairperson: Netcare Research Operations Committee

**Netcare Hospitals (Pty) Ltd**

**Date:** 02 June 2017

