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Chapter 4

Impact of Body Image Perception on Weight Status: A Refuelling of Non-communicable Disease in Urban South African Zulu Women: Not Just Calipers, Tapes and Scales

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Additional information is available at the end of the chapter

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Abstract

The purpose of this study was to determine Zulu women's perceptions of their body image relative to weight status attending a noncommunicable diseases (NCDs) clinic in South Africa. A cross-sectional exploratory study design was used and included 328 (91%) Zulu women who were sampled systematically. The women were subjected to anthropometric measurements and engaged the Stunkard's body image figures to determine perception. The study showed that 61% of the sample was in the 40–59 age strata. The mean body mass index (BMI) was 37 kg/m^2 (±9.41 kg/m^2) with over 90% being overweight or obese. A discrepancy between Zulu women's perceived body image and actual (BMI) existed in all weight status categories with overweight and obesity demonstrating the widest variations ($p < 0.000$). Women perceived themselves to be thinner than their actual BMI. More than 99% associated an underweight body image to one with disease. Diabetes mellitus (72%) was the most frequent NCD encountered. Only 23% with this condition correctly perceived their body image. It was shown that the negative impact of preferring a larger body image in Zulu women with preexisting NCD's could be refueling their existing comorbidities.

Keywords: Zulu women, body image, noncommunicable diseases (NCDs), weight status

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1. Introduction

1.1. Definitions

Body image: Is the subjective perception people feel about their bodies, encompassing self-knowledge and attitudes towards their physical appearance [1].

Perceptions: These are ideas that exist in the minds of people as the result of careful mental activity, and ideas about how they are viewed by other people [1].

Zulu: A member of a race of black people who live in South Africa [2].

1.2. Statement of the problem

The global prevalence of overweight and obesity in the adult population is estimated to be 1.1 billion of which 312 million are obese. This represents approximately 26% world's population [3, 4].

A national survey, The South African Demographic and Health Survey (SADHS), conducted in 1998 provided the first insight into the anthropometric profile of South African adults [5]. The survey showed that in a locality of the globe where corpulence is infrequent high degrees of excess body weight were observed particularly among South African females [3]. The prevalence of obesity was extremely above what is usual among women (30%), being higher in metropolitan than rural (25%) areas [5].

Reports indicate that many South African womenfolk fail to adhere to a healthy lifestyle behaviour modification, such as weight reduction [6, 7]. This may be due to socio-cultural norms, and it may be related to an observation that weight loss is associated with diseases for example HIV/AIDS [1, 6, 7]. In the past surplus body mass has been regarded as a problem of westernisation connected to privileged circumstances, presently it is also acknowledged as a principal risk factor for non-communicable diseases (NCDs) in middle income nations, and is of evolving significance in low income nations [**8**]. Concerning a contemporary study which explored adult female patterns of overweight and underweight in emerging regions, overweight surpassed underweight in over 50% of the world's countries undergoing industrialisation [9].

The situation is generally accepted that extra body weight is associated with an escalated threat of illness [10]. Obesity has been quantified aptly by the International Statistical Classification of Disease as a distinctive disorder [11]. The Comparative Risk Assessment Study (Global CRA) of The World Health Organisation (WHO) reckons that in adults 30 years and older, rises in BMI beyond 21 kg/m^2 were linked with a projected 58% of type 2 diabetes mellitus (T2DM), 21% of ischemic heart disease (IHD), 39% of hypertensive disorders, 23% of ischemic cerebrovascular accidents, 12% of colonic cancer, 8% of postmenopausal related breast cancer, 32% of uterine cancer, and 13% of osteoarthritis [11–16].

In the study 'Estimating the burden of disease attributable to excess body weight in South Africa in 2000' the frequency of excess body weight in South African adults aged 30 years and older was reported to be predominantly high in the female population [17]. Women exhibited

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double the number of mortalities and disability-adjusted life years (DALYs) ascribed to excess body weight than did men. Excess body weight and its devastating sequele resulted in 10% of female deaths in the populace. The magnitudes of T2DM, circulatory disorders and certain cancers ascribed to excess body weight in South Africa were much higher than approximates in women chiefly [17].

There are no studies to date, assessing perceptions of weight and body image, in KwaZulu Natal despite organisations like The World Health Organisation (WHO) and European Union highlighting the significance of considering the social, cultural, political, physical and structural (environmental) impacts for successful deterrence and controlling of overweight and obesity [6, 18].

1.3. Rationale for the study

Overweight and obesity are both avoidable conditions. These conditions are a key public health quandary among women, and particularly in South African Zulu women [5]. The health outcomes of overweight and obesity are fuelled morbidity and mortality which negatively impacts on the escalating health care cost [1]. Ascertaining and tackling patient barriers to behavioural change may assist in the development of effective interventions.

It may well be that, in a high HIV prevalence area, women may perceive themselves to be thinner than their actual body image and therefore more reluctant to lose weight as they do not wish to be stigmatised by HIV disease? It was therefore imperative that perception of body figure be probed in devising intervention approaches for tackling obesity in South African Zulu women with chronic diseases.

1.4. Conceptual framework

Figure 1 provides an overview of how misperception of body weight can result in further burdening of existing NCD's.

1.5. An overview of weight categories

The United States Centres' for Disease Control and Prevention (CDC) defines overweight, obesity and morbid obesity in adults as body mass index (BMI) of 25–29.9, 30–39, and 40 or more respectively. The BMI is computed by dividing an individual's weight in kilogrammes by height in meters squared [19].

1.6. Prevalence of overweight and obesity

The occurrence of obesity is mounting precipitously all over the globe, in mutually developed as well as developing nations, and it impinges on all sectors of the public [20]. The SADHS of 1998 examined the anthropometric pattern of over 13,000 South Africans between the ages of 15 and 95 years and found that the pattern of malnutrition in South Africa was predominantly one of over- nutrition rather than under- nutrition, a paradox when South Africa is undergoing economic transition. This study found that the general frequency of overweight and obesity in

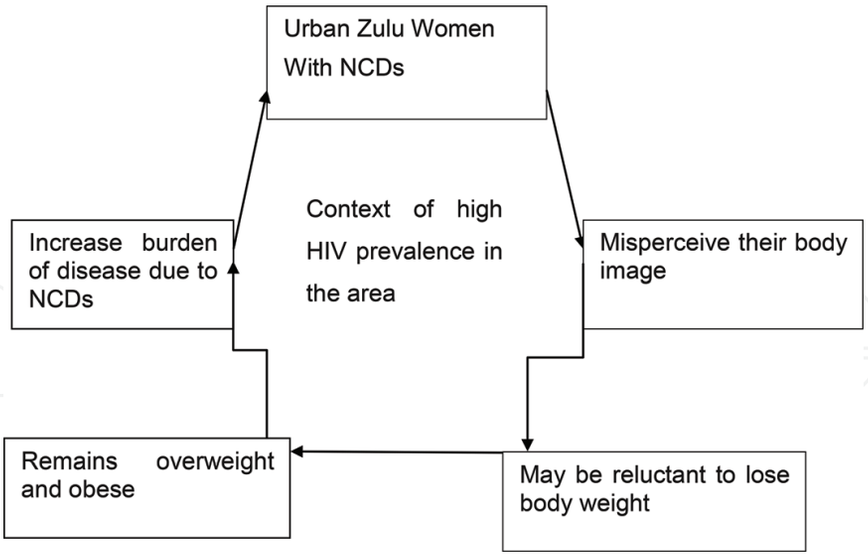


Figure 1. Conceptual framework of this study.

the South African general population was excessive with more than 29% of men and 56% of women labelled as overweight or obese [5, 21].

1.7. Perceptions of weight

The SADHS suggested that a major challenge facing the management of obesity, in South Africa, is that of people's perceptions of their weight. The SADHS revealed that people generally underestimated their weight especially among the overweight and obese categories. A minority of men (9.7%) considered themselves to be overweight or obese, when in fact their measured weight fell within the overweight to obese category. Similarly, a quarter of women (22.1%) perceived themselves as overweight, whereas a half (56.6%) had measured weights within the overweight to obese categories [5].

In South Africa the Acquired Immune Deficiency Syndrome (AIDS) which is the chief cause of death represented by 30% of mortality, followed by cardiovascular disorders (CVD) at 17%. In the list of the top twenty specific causes of premature mortality burden, women over men were found to have a greater fraction of deaths due to HIV/AIDS, CVA's, hypertensive heart complications and diabetes mellitus [22]. An intervention, to address obesity in this susceptible group of individuals is lacking.

A South African study by Puoane et al. established that women have an inaccurate perception about their weight with 22% of the females of all races distinguished themselves as overweight whereas 56.6% were essentially overweight. This study also showed that a minority (16%) of black females identified themselves as being overweight whereas in fact half (26.7%) were overweight and a third (31.8%) were obese [7].

A black women's` perceptions of an ideal weight appear to be influenced by factors such as culture, it has been stated that being overweight and even obese is advantageous and has many positive implications [1]. A perception that being overweight is desirable may be related to the

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HIV/AIDS epidemic. There may be a perception that thinness is associated with a positive HIV status. A Western-based study indicates that African women in America, who were affected with HIV endeavoured to put on instead to lose weight so as to avoid being stigmatised [6].

A preference for a large body dimension among HIV-infected women has likewise been reported in an African setting. In the study titled "Big is Beautiful" the researchers looked at a number of the observed gains of being overweight and reported that being overweight signified that one was taken excellent care of by their spouse. It also meant that one was "able to stir big pots and would not be blown away by the strong Cape Town winds." On the other hand being thin was linked with melancholy, poor treatment and most importantly stigmatised having HIV/AIDS. The women were concerned about the association between thinness and HIV/AIDS and preferred to be overweight to avoid being looked down upon by society [1].

1.7.1. Instruments

Studies have considered variables, other than weight, such as "body image." Body image pictures have been used to explore peoples` perceptions about their body. A tool to determine people's perceptions of their body image, "Body shape drawings" was created by Stunkard et al. [23]. This tool has been authenticated and modified for application in the South African populace by Mciza et al. The findings validated that weight status (BMI) in black female women associated positively with the designated silhouettes based on size. It was resolved that silhouettes ranging from very thin (1) to very obese (8) are age linked, culturally complex and could be used in future intervention analyses to understand body appeal [24].

Some of the dilemmas are that if Zulu women perceive that their weight is not a risk to their health, when in fact it may be so, then they may be resistant to undertake interventions to assist them to lose weight. A misperception, regarding weight, may be regarded as a barrier to weight loss and therefore overcoming such barriers may contribute to effectiveness of weight loss interventions. There is a paucity of studies particularly in South Africa, regarding perceptions of weight and body image involving other race categories such as White, Coloured or Indian. Some studies have indicated that black women are at a greater risk of overweight and obesity than black men [5].

No research has been done in this high risk group to establish whether misperception of one's body image influences the decision to engage in a weight loss programme which is a major objective of this study. Therefore this study focused on Zulu women only.

2. Body image perception relative to weight status in Zulu women

2.1. Aim of the study

The purpose of this study was to determine whether urban Zulu women attending a NCD clinic, which emphasise conventional weight loss strategies, misperceive their body size in comparison to their derived BMI.(Weight Status).

2.2. Key objectives for this study

The key objectives of this study were as follows:

1. To determine if women's perception of their body image differed from their calculated BMI.
2. To relate the above in terms of their underlying medical conditions.
3. To describe the women's perception of their preferred body image, a healthy body image and one that represents disease and HIV/AIDS.
4. To suggest recommendations to policy makers, health managers, health researchers and clinicians regarding potential weight loss interventions based on the findings.

2.3. Type of research

This was an exploratory study.

2.4. Study design

A cross-sectional exploratory study design incorporating quantitative research methodology was used to review perceptions of body image in subjects having underlying NCD's.

2.5. Study population

The sampling reference was Zulu women (over the age of 18 years) who attended a chronic clinic based at Wentworth Hospital in Durban. This hospital was selected for convenience because it has a clinic which specifically reviews women who have chronic diseases. The clinic chosen is not an antiretroviral clinic. The attendees are multiracial and women have a range of chronic medical conditions.

2.6. Sample size and sampling method

It was estimated that 2000 Zulu women attend this clinic in a year obtained from the chronic patient booking register. This record is kept at the booking clerk who issues the appointments for the chronic attendees. A sample of approximately 10% (n = 328) will allow a 5% margin of error in estimating categorical population parameters with 95% confidence [25]. This was determined by a statistician to avoid underestimation of the sample size.

All Zulu women who attended the clinic during June 2010 to October 2010 were given an opportunity to participate in this study. A systematic sampling method was employed. The calculated sampling fraction was: 328 (sample size)/2000 (study population) =1/6.This resulted in a sampling interval of 6.The number of the first participant included in the sample was chosen randomly, by blindly picking one of the six pieces of paper, numbered 1 to 6. The first participant to be chosen corresponded to the number chosen and then every sixth participant was included until 328 participants were selected.

An additional 32 (10%) patients were sampled to anticipate drop offs during the study period. A record was kept of all patients who refused to participate and the reasons for their non-participation [25, 26].

A large sign on the clinic wall inviting all Zulu women to participate in the study. Clinic sisters briefed all clinic attendees on the nature of the study.

The study information sheet was translated into isiZulu, which is the main language spoken by most participants. IsiZulu was then translated back into English to ensure that the translator captured the meaning. Clinic sisters in general spoke isiZulu and were able to assist participants to make a decision regarding partaking in the study.

The majority of patients attending the clinic were from the urban and surrounding areas. These patients have had some form of formal education. For those who were unable to read and write, a dedicated clinic sister fluent with isiZulu and English explained all information contained in the patient information and the informed consent at a level of a grade 4. Those patients who were willing to participate in the study produced a right thumb print in place of a signature on the informed consent form. All patients still not clear of the process of the study after several failed attempts in bringing clarity were excluded.

The information sheet was translated in the language the patient requested for family members to read to the participant if the participant so desired.

If a woman agreed to participate, she signed a consent form and the researcher then interviewed her in a private consulting room at the clinic.

2.7. Inclusion criteria

- Ages between 18 and 70 years.
- Having chronic non-communicable diseases.
- Attending the clinic for more than 1 year.

2.8. Exclusion criteria

Exclusion criteria were all pregnant women and those subjects not willing to participate.

2.9. Data sources

The data sources used for this study included the following:

- Case file record
- Body image pictures
- Anthropometric measurements to determine weight status

2.9.1. Case record files (CRF)

A case record file was used to record demographic and medical details on participants. Variables included age and medical condition/s. The researcher reviewed the clinic records to determine the primary chronic medical condition/s.

2.9.2. Body image pictures

Delineations of body image were used to investigate perceptions about body weight and body image. These pictures have been selected as a method because the silhouettes may allow women, who are not literate, to express their perception of their body image. This tool has been ratified and tailored for application in the South African populace. Body image silhouettes 7 and 8 representing obesity, 5 and 6 overweight, 3 and 4 normal weight with 1 and 2 being underweight.

2.9.3. Anthropometric measurements

The height was logged to the closest 0.1 cm by means of a metal gauging tape. This was positioned alongside a level hedge, with a straight crown board secured at 90° to the hedge. All subjects were assessed with no head gear and footwear with their vertebral column, rear end and heels placed as close to the hedge as feasible to obtain a reliable approximation.

The subject's weight was ascertained by means of a standardised automated load cell numerical scale with a ceiling weight of 136 kg (UC-Precision Health Scale, accurate to 0.05 kg). An equivalent scale was utilised to establish the masses of those weightier than 136 kg (Soehnle Medica, accurate to 500 g, maximum 150 kg). For subjects weighing above 150 kg, two equivalent scales were used with a single foot on each one respectively. Every woman was weighed using light clothes without shoes and head gear. The same scale was used to measure weight throughout the study. All measurements were made and recorded by the health promotion sister so as to ensure internal validity of the measuring instrument.

The waist and hip circumference was determined using a standard flexible tape measure. The waist perimeter determined to the closest centimetre was used as estimation for the abdominal girth. The thinnest part of the trunk observed from the anterior side of the women's body was quantified with the tape measure held at a two-finger digit gap above the umbilicus. The hip circumference was measured using a flexible measuring tape over the midpoints where the femur attaches to the pelvis on both sides.

2.10. Data analysis

Data was entered in Microsoft Excel spreadsheet which was then transferred onto SPSS-16 statistical package for analysis with the assistance of a statistician from the department of Biostatistics- University of KwaZulu Natal. Descriptive analysis of quantitative variables included mean, median, range and mode, while categorical variables were summarised and displayed on frequency tables and bar charts. Outcome variables such as measured BMI and

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actual body image were linked to perceived body image using the Student's *t*-test. A p value <0.05 was considered as statistically significant at the 95% confidence interval.

2.11. Ethical considerations

Permission to carry out this study was obtained from the University of KwaZulu Natal Ethics Committee and Postgraduate Committee. The study only commenced when full approval to conduct the study was obtained. Permission to carry out the study was obtained in writing from Clinic Managers and relevant authorities at the Provincial Department of Health. (Reference number: BE181/09).

Ethical issues around confidentiality. No names of participants were used on any of data collection tools. Consent forms were stored in a locked up cupboard separate from all other data. Only the researcher had access to the data and signed consent forms.

Voluntary participation. All participants were informed that participation was voluntary and they had the option to decline the offer of participating in this research. Their refusal would not prejudice them from the quality of healthcare they received in the future. Further, even after they had given consent to participate they were free to stop the interview at any stage or refuse a certain measurement to be taken from them. All patients who felt a sense of discomfort when talking about their weight were offered counselling, guidance and education for overweight and obese patients.

Care was taken not to stigmatise women in relation to their medical condition (including HIV disease) as all women who attended the clinic were invited to participate. All recommendations made by the ethics and postgraduate committee were strictly adhered.

2.12. Results

2.12.1. Demographic data of study subjects

A total of 360 urban black Zulu women were recruited using a systematic sampling method, from a chronic disease clinic, of which only 328 participated in the study giving a response rate of 91%. The age of the Zulu women ranged from 19 to 70 years with a mean of 49 years (SD ± 12.05). Approximately 61% of the study subjects were between the ages of 40 and 59 years with the minority (19%) being within the 19–39 age strata (**Table 1**).

2.13. Anthropometric measurements

Anthropometric measurements were obtained from all the study subjects. The body weight ranged between 40.4 and 193.9 kg. The mean weight in kilogrammes (kg) was 88.44 (SD ± 23.44) and the mean height in meters (m) was 1.54 (SD ± 0.057).The mean BMI was 37.24 (SD ± 9.41). **Table 1** shows that BMI increased with age for the exception of the above sixties where a decrease was noted. The participants calculated average Waist/Hip(W/Hip) and Waist/Height(W/Ht) ratio were 0.85 (SD ± 0.102) and 0.62 (0.113) respectively (**Table 2**).

Age in (years)	Number of subjects	Percentage in each category (%)	Mean BMI	Standard deviation (SD)
19–29	28	9	27	±7.64
30–39	35	10	34	±9.54
40–49	73	22	36	±9.70
50–59	127	39	39	±8.75
≥60	65	20	37	±7.98
TOTAL	*N*=328	100		

Table 1. Mean BMI of 328 Zulu women suffering from chronic conditions categorised by age strata.

Variable	Number of subjects	Mean	Std deviation
Weight	328	88.44	23.440
Height	328	1.54	0.057
BMI	328	37.24	9.406
Waist circumference	328	94.92	17.353
Hip circumference	328	111.35	15.386
W/HIP ratio	328	0.85	0.102
W/Ht ratio	328	0.62	0.113

Table 2. Anthropometric results of 328 Zulu women.

BMI category	%
Underweight	0
Normal	8
Overweight	16
Obese	76
Total	**100**

Table 3. The body mass index (BMI) pattern of 328 subjects.

Table *3* describes the weight categories of the study sample with only 8% of participants having a normal BMI with over 90% being either overweight or obese (**Figure *2***).

2.14. Subject's perception of body image in relation to BMI

A discrepancy between perceived body image and actual body image existed in all weight categories with the overweight and obese categories demonstrating the widest variations. Approximately 52% of females perceived they being overweight with 76% having a BMI ≥ 30 kg/m^2 indicating that 49% misperceived their body size in the obese group (**Table 4**).

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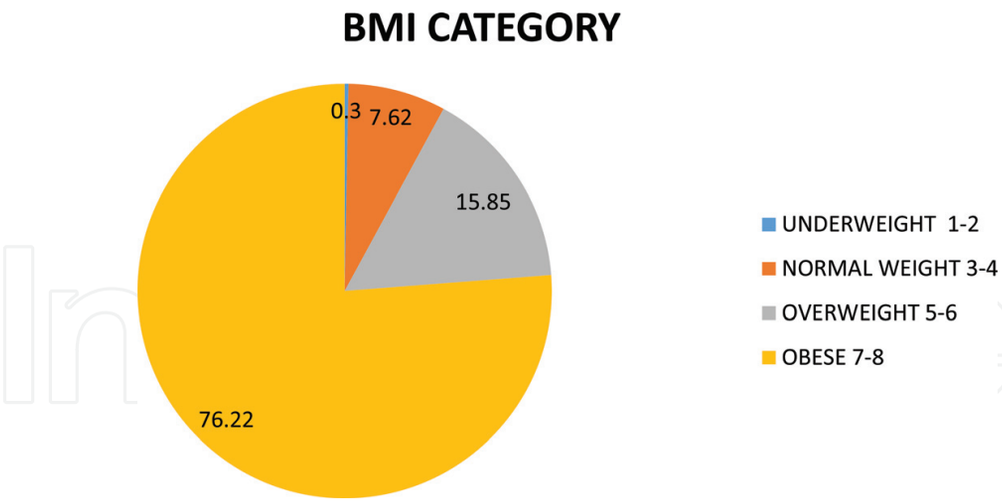


Figure 2. Pie graph showing the BMI distribution of the study population.

Perceived weight	Derived BMI					
	Underweight ≤18.5	**Normal 18.5–24.9**	**Overweight 25–29.9**	**Obese ≥30**	**Total N = 328**	**100%**
Underweight	1 (0.30%)	9 (2.74%)	8 (2.44%)	3 (0.91%)	21	6.4
Normal	0	13 (3.96%)	15 (4.57%)	19 (5.79%)	47	14.33
Overweight	0	4 (1.22%)	26 (7.93%)	141 (42.99%)	171	52.13
Obese	0	0	2 (0.61%)	87 (26.52%)	89	27.13
Total	1 (0.30%)	26 (7.93%)	51 (15.55%)	250 (76.22%)	328	100

Table 4. Subjects perception of body image in relation to the BMI.

2.15. Chronic conditions in relation to actual BMI

The most frequent chronic medical condition encountered was that of diabetes mellitus (72%) with less than 1% suffering from ischemic heart disease. The weight categories mostly associated with diabetes mellitus was that of the overweight and obese groups representing 71% of the study population (**Table 5**).

2.16. Chronic conditions in relation to perceived body image

In those subjects who had diabetes mellitus they misperceived themselves to be thinner than their actual BMI (**Table 5**). Only 23% perceived themselves to be obese and having diabetes mellitus as compared to 64% with a BMI ≥ 30 kg/m^2 with the same medical condition (**Tables 5** and **6**). A similar trend was noted for the overweight category with diabetes mellitus. Those with a normal BMI and having underlying diabetes mellitus were under 1% in comparison to approximately 9% who perceived themselves to be of normal weight with the same health profile.

Chronic medical condition/s	BMI					
	Underweight	Normal	Overweight	Obese	Total	%
Hypertension	0	1 (0.30%)	2 (0.61%)	4 (1.22%)	7	2.1
Hypertension and osteoarthritis	0	0	0	4 (1.22%)	4	1.2
Diabetes	0	2 (0.61%)	10 (3.05%)	62 (18.9%)	74	22.6
Diabetes and ischemic heart disease	0	0	0	2 (0.61%)	2	0.6
Diabetes and osteoarthritis	0	0	4 (1.22%)	54 (16.46%)	58	17.7
Hypertension and diabetes co-morbidity	0	1 (0.30%)	9 (2.74%)	53 (16.16%)	63	19.2
Diabetes, hypertension and osteoarthritis	0	0	1 (0.30%)	38 (11.59%)	39	11.9
Ischemic heart disease	0	0	0	1 (0.30%)	1	0.3
Osteoarthritis	0	13 (3.96%)	14 (4.27%)	22 (6.71%)	49	14.9
Other	1 (0.30%)	9 (2.74%)	11 (3.35%)	10 (3.05%)	31	9.5
Total (%)	1 (0.3)	26 (7.9)	51 (15.6)	250 (76.2)	N = 328	100%

Table 5. Medical condition in relation to actual BMI.

Medical condition/s	Perceived body image					
	Underweight	Normal	Overweight	Obese	Total	%
Hypertension	2 (0.61%)	1 (0.30%)	4 (1.22%0	0	7	2.1
Hypertension and osteoarthritis	0	0	2 (0.61%)	2 (0.61%)	4	1.2
Diabetes	2 (0.61%)	10 (3.05%)	45 (13.72%)	17 (5.18%)	74	22.6
Diabetes and ischemic heart disease	0	1 (0.30%)	1 (0.30%)	0	2	0.6
Diabetes and osteoarthritis	0	6 (1.83%)	29 (8.84%)	23 (7.01%)	58	17.7
Hypertension and diabetes co-morbidity	6 (1.83%)	9 (2.74%)	26 (7.93%)	22 (6.71%)	63	19.2
Diabetes, hypertension and osteoarthritis	0	3 (0.91%)	24 (7.31%)	12 (3.66%)	39	11.9
Ischemic heart disease	1 (0.30%)	0	0	0	1	0.3
Osteoarthritis	6 (1.83%)	6 (1.83%)	25 (7.62%)	12 (3.66%)	49	14.9
Other	5 (1.52%)	11 (3.35%)	14 (4.27%)	1 (0.30%)	31	9.5
Total (%)	22 (6.7)	47 (14.3)	170 (51.8)	89 (27.1)	N = 328	100

Table 6. Medical condition in relation to perceived body image.

2.17. Zulu women's perception of body image

The subjects in this study population preferred an overweight body image as compared to a normal body size. A small proportion opted for either an underweight or an obese body silhouette. An almost equal number of subjects associated being healthy and free of disease to that of a normal body image and overweight body image (**Figure 3**). Almost 100% of participants chose the underweight silhouettes to represent a sufferer with HIV/AIDS.

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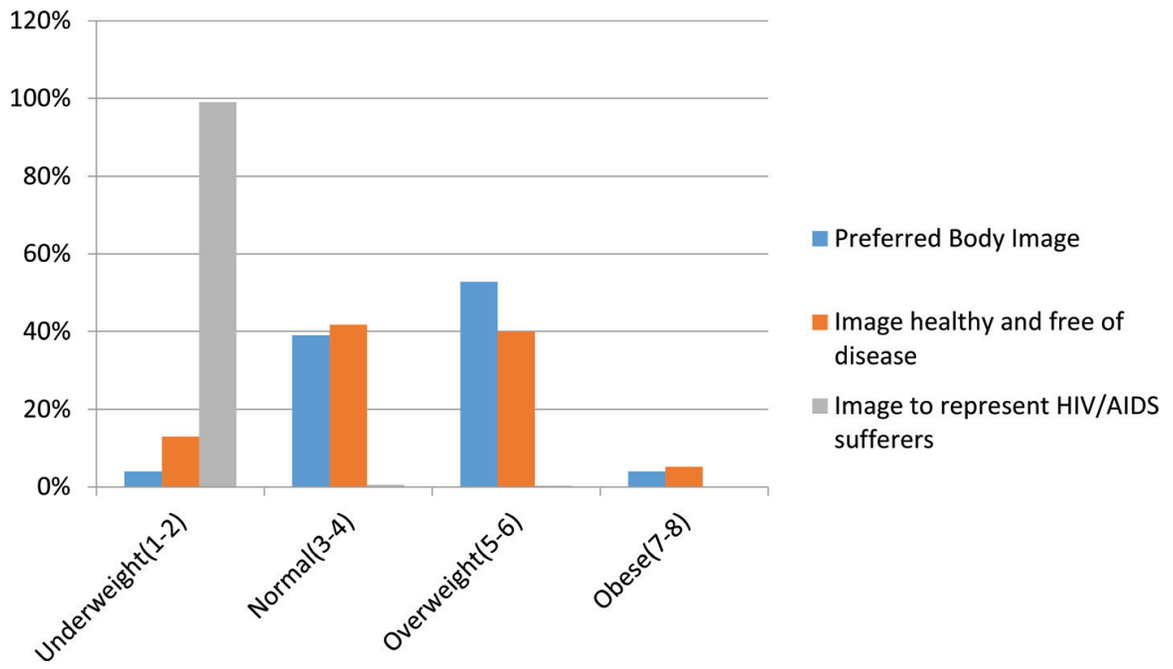


Figure 3. Subjects perception of body image in relation to preferred body image, healthy and free of disease body image and body image representing disease and HIV/AIDS sufferers.

2.18. Statistical analysis

2.18.1. Zulu women's perception of their body image compared to actual BMI

A one sample t-test between proportions was performed to determine whether there was a significant difference between women's perception of their body weight and the derived BMI across all weight categories. The t-statistic was significant at the .05 critical alpha level across the weight categories (**Table 7**).

2.19. Discussion

The Moscow Declaration which stemmed from the initial global governmental discussion on healthy way of life and NCD regulation held during April 2011 emphasised that a paradigm

Weight categories	Actual BMI, %	Women's perception of body image, %	One Sample t-test, p-value
Underweight	0.3	6.4	.0000[#]
Normal	7.62	14.33	.0092[#]
Overweight	15.85	52.13	.0000[#]
Obese	76.22	27.13	.0000[#]
Total	100	100	—

[#]Significance at the .05 critical alpha level.

Table 7. Comparison of Zulu women's perception of their body image and actual BM.

swing was critical in addressing challenges arising from the burden due to NCD. The key objective promoted was that NCDs are triggered by not only biomedical dynamics, but also greatly predisposed by behaviour, ecological, societal and fiscal factors [27, 28].

In the South African context, urban Zulu women are inevitably faced with urbanisation and globalisation which has caused a transition from traditional foods low in fat and high in protein towards one high in saturated fats and reduced fibre. With urbanisation comes the risk of changes in conventional eating habits, physical inactivity, introduction to tobacco products, alcohol and foods rich in fats. These are all risk factors for developing NCDs [29].

Obesity, in the 1998 nationwide survey, was strongly linked with residential area, ethnicity, level of education and age [5]. Studies have shown that culture dictates one's body image. In the black communities, perceptions and beliefs of their body weight have a direct impact on their body image. Black women demonstrated a discrepancy in perception of their body image in relation to actual BMI. In the obese and overweight categories less women actually identified themselves correctly [1, 5, 30]. There is also an increasing pressure to be obese and overweight because of the association of thinness to one being sick or having HIV/AIDS [1].

The key objective of this study was to investigate urban women's perception of their body image against a milieu of preexisting NCDs against a backdrop of high HIV prevalence. This is a pioneer study addressing the challenges posed by NCD in a context of KZN which has the highest prevalence of HIV in the country [1].

This study showed a higher prevalence of overweight and obesity than previous studies conducted in South Africa [5, 31]. This demonstrates that the prevalence of NCDs is on the rise and particularly among the vulnerable urban Zulu women. Studies have shown that a higher prevalence of obesity existed among urban black female dwellers and that they are at a higher risk of progressive cardiovascular complications [32–35].

It was previously widely accepted that urban black women have a decreased mortality from ischemic heart disease (IHD) than white women and the black race group has a favourable lipid profile in comparison to their white counterparts [29, 36]. The notion that because there was no association between obesity and IHD which was held for almost three decades resulted in neglecting the association of obesity with other co-morbidities. This includes glucose intolerance and T2DM, hypertensive disease, strokes and peripheral vascular disease. It was assumed that due to the black populace having a favourable lipid profile that obesity had no significance [29, 36]. Ever since, advances in medical science have shown that these are distinctive indicators of the metabolic syndrome [29]. Though black South Africans may still be guarded because of advantageous blood lipid profile, however the increased consumption of western diets which are connected with increase in BMI of men and women and serum cholesterol may predispose to a higher risk of cardiovascular events in the future [37, 38].

Vast work led by Puoane et al. on black women's perception of their body image in urban settings found that under 50% of the overweight woman really saw themselves as being overweight [1]. This misperception between perceived body image and actual body image whereby individuals who perceived themselves being obese were above a third as contrasted to more than two thirds having a BMI ≥ 30 kg/m^2. Similar trends were described in nationwide

and worldwide surveys, which found that a smaller number of women perceived they being obese compared to their actual BMIs [4, 31]. These findings were supported by this study.

In South Africa we face a quadruple burden of disease with one of them pertaining to NCD with overweight and obesity fortifying its foundations [39]. It is widely accepted that overweight and obesity predisposes to hypertension, glucose intolerance and diabetes [40]. The risk of T2DM surges with the magnitude and extent of overweight and the intensity of central adiposity [31, 41, 42]. The Nurses' Health Study indicated that the risk of diabetes mellitus soared 40-fold when the BMI rose from 22 to 35 kg/m^2 [41].

This was consistent to the findings of our study which demonstrated a frequency of T2DM of more than two thirds in patients with a BMI ≥ 25 kg/m^2. The concept of 'benign' or 'healthy' obesity in the black South African population is a paradox. Ischemic heart disease was prevalent in under 1% of our study populace coherent with the outcomes by Seedat et al. [43, 44]. This denotes that black women are at a lower risk of IHD due to their favourable lipid profile but at a higher risk of developing T2DM [37, 38].

Harold et al. centred on the outcomes of the US Study to Help Improve Early evaluation and management of risk factors Leading to Diabetes (SHIELD) showed that major discrepancies existed in body image between women with T2DM with a misperception of one's own weight-related appearance was more frequent [45]. Our study reinforces these findings where the prevalence of diabetes in the obese group was under two thirds with just over a third underestimating their body size. If women perceive herself thinner than her actual BMI she may be more disinclined to lose weight which is a necessity for successful blood glucose control. Failure to appreciate the need for weight loss could be fuelling fatal complications thereby increasing the healthcare burden related to NCDs [29].

Hypertension on the hand was the second frequent chronic condition accounting for over a third of the study population. Other studies also demonstrated that the risk of hypertension was compellingly associated with overweight and obesity [46]. The high overweight and obesity prevalence found in this study may explain the elevated hypertension morbidity in this patient population [29, 47–49].

Kwazulu-Natal (KZN) has recorded the highest HIV prevalence (16%) compared to any other province in South Africa [50]. Recent studies by Matoti-Mvalo and Puoane which investigated the insight among urban women that skinny people are disease-ridden with HIV found that more than two thirds of the women connected the malnourished figures with individuals infected with HIV [35]. Due to the high prevalence of HIV it could well be that women are considerably sensitised about weight, HIV and AIDS which may explain the high level of perception in this study.

The study 'Big is Beautiful' highlighted that a huge body bulk was preferred among urban black women. They saw this to signify material comfort and contentment in direct contrast to westernised societies where a women is stigmatised for being obese or rounded [1, 51]. Matoti-Mvalo and Puoane established that a normal weight body image was preferred over overweight or obese body image in urban black women [35]. This could be due to the lower HIV prevalence (6%) in the province compared to that of KZN [50].

In urban black women with established NCD a preference towards an overweight body image goes contrary to weight loss strategies. This is disconcerting given that these women have prior knowledge of the health benefits associated with weight loss but choose to be overweight and even obese instead. This preference for a larger than normal body size, in this group of patients could be strongly influenced by the high HIV prevalence in the area [1, 50].

These findings differed from other studies which showed a higher percentage associating normal weight body image with health and free from disease followed by overweight body image [35]. The reason for our finding could be due to the complex interplay of socio-behavioural factors related to HIV and AIDS which could have altered their perception for a normal to overweight body image to avoid the social stigma connected with HIV and AIDS [1, 35].

2.20. Limitations of the study

This study acknowledges its limitations in a number of ways. The population included only urban Zulu women and hence cannot be generalised to women living in rural areas. The race group chosen was that of Zulu and the outcome of the study may be different in other race and ethnic groups.

The prevalence in our study could have been overstated by the fact that the sample was drawn from an already established NCD clinic and therefore the results cannot be generalised.

Further the study setting was that of a chronic clinic which deals with conditions associated with obesity and overweight and therefore the prevalence of overweight and obesity in our study was much higher than the general population. The participants' HIV status was not explored in this study and this could have influenced the women's choice of body image.

3. Conclusion

This study described women's perception of their body image who have preexisting NCD's.

Urban Zulu women attending a NCD clinic do indeed misperceive themselves to be thinner than their actual BMI. The reasons for this distorted perception are multifaceted and could be due to the awareness that slenderness is related to having disease. To avoid stigmatisation urban women often preferred a larger body size over a healthy body size. A misperception of one's body image may be used as a surrogate risk marker in the early detection of weight gain in prone urban Zulu women.

In a NCD clinic where weight loss programmes forms an integral part of the management of lifestyle changes most Zulu women preferred a larger body image instead of a normal body image. This indicates that unless a socio-behavioural and cultural approach is employed in the consultation, attempts to engage this group of women into a weight loss programme may be rendered fruitless.

Zulu women living in an area of high HIV prevalence may be adamant to shed those extra kilos so as to avoid community level pressure. This vicious cycle of fear of stigmatisation,

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failure to follow a diet prescription, further weight gain, complications associated with NCD and increased healthcare cost could only be intercepted if there is full commitment from all the relevant stakeholders.

Greater emphasis should be placed on preventing the devastating complications arising from poorly treated NCDs. An ounce of prevention is worth more than a pound of cure holds true in an already resource constraint setting to curb the rising healthcare cost attributed to the refuelling of NCDs amongst vulnerable Zulu women with already established NCD's living in South Africa. An etho-cultural specific approach to weight loss management in this populace will be more beneficial over traditional strategies.

3.1. Recommendations

1. A larger study is required to include other comparative race and ethnic groups.
2. Patient education on the negative outcomes of obesity and NCDs.
3. Patient education on diet, exercise and the positive outcomes.
4. Use of the body image silhouettes in NCD clinics to establish perceived versus actual body image for effective weight loss intervention.

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Conflict of interest

The authors declare that they have no material benefit or personal relationship(s) that may have inappropriately influenced them in writing this paper.

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