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Obese patients reported dissatisfaction with weight, body image and interaction with clinicians at Dr Yusuf Dadoo District Hospital

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OBESE PATIENTS REPORTED DISSATISFACTION WITH WEIGHT, BODY IMAGE AND INTERACTION WITH CLINICIANS AT DR YUSUF DADOO DISTRICT HOSPITAL

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of
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PhD (Family Medicine) MSc (Psych)
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DECLARATION

I, Dr Buhendwa Kanozire, hereby declare that this research is my own unaided work, except where due acknowledgement for assistance received has been made. It is being submitted for the degree of Master of Family Medicine at the University of the Witwatersrand, Johannesburg. It has not been submitted previously for any other degree or examination at this or any other University.

Signed  (Signature of the candidate)

Date: 12th December 2022



Signed ……

(Supervisor)

Date: 12th December 2022

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I would like to thank Dr Deidré Pretorius for agreeing to supervise this research study from conception until completion and Dr Moshe Magethi for partially supervising this study's proposal for submission to the Wits ethics committee. Further words of thanks should go to the Family Medicine department in West Rand for the support received during the study and the Dr Yusuf Dadoo Hospital outpatient department's nursing team for the help received during data collection. All those who made this project reach its completion should find the expression of my gratitude in these few words.

DEDICATION

To my wife and children, whose prayers, support, understanding and endurance have allowed me to reach the finish line.

NOMENCLATURE

95% CI: 95 % Confidence Interval

BMI: Body Mass Index

CVD: Cardiovascular Disease

GDP: Gross domestic product

IAS: International Atherosclerosis Society

ICCR: International Chair on Cardiometabolic Risk

NCD: Non-communicable disease

OR: Odds Ratio

p: p-values

SANHANES-1: South African National Health and Nutrition Examination Survey – First edition

WC: Waist Circumference

WHO: World Health Organisation

ADDITIONAL INFORMATION

This study's broader aim was to explore the determinant factors of obesity management by exploring obese patients' perception of weight, barriers to weight reduction and preferred weight-loss interventions.

The objectives were:

1. To examine the demographics of obese patients attending Dr Yusuf Dadoo Hospital
2. To evaluate obese patients' dissatisfaction with weight and body image in relation to their anthropometric measurements.
3. To assess obese patients' level of awareness of health risks associated with obesity.
4. To explore obese patients perceived barriers to weight reduction and preferred medical interventions.

The data collected during this study were too much for one article, and the author and supervisor decided to break it down into three different themes, namely:

1. Obese patients reported dissatisfaction with weight, body image and interaction with clinicians at Dr Yusuf Dadoo District Hospital.
2. Obese patients' health awareness and reported barriers to weight reduction at Dr Yusuf Dadoo District Hospital.
3. Obese patients preferred medical intervention at Dr Yusuf Dadoo District Hospital.

To meet the requirements for the MMed (Family Medicine report), a subset of a larger data set was identified from the study, namely "obese patients' dissatisfaction with weight and body image, barriers to weight reduction and preferred medical intervention at Dr Yusuf Dadoo Hospital, West Rand District" for the examination and first article.

As the article will only represent the methods applicable to the article's content, the author wishes to supplement this information for examining purposes.

The data collection tool had four sections. The first section comprised anonymised respondent identification details and demographics. The second contained a semi-structured questionnaire related to the patient's perception and attitude to weight, perceived barriers to weight reduction, preferred medical interventions and interaction with healthcare providers. This questionnaire was an adapted version of a questionnaire

used by Thomas and colleagues in a study on weight perception.[1] Although the questionnaire was used as part of a qualitative study, it was well-tailored to answer our primary research questions after adaptation. As part of the adaptation, Thomas and colleagues' focus group questionnaire was used as a foundation for our structured questionnaire. In contrast, the author changed the body image assessment tool used in the study to a more culturally relevant and gender inclusive.

The structured questionnaire was piloted at the study site to test its feasibility and relevance in our study setting. Seven patients participated in the pilot study and some changes were made. Also, because of the pilot study, the questionnaire was translated into Afrikaans to accommodate the big proportion of Afrikaans-speaking participants who could not be assisted by the research assistant, who was more fluent in Setswana and isiZulu. The piloted number was not added to the final sample due to the amendments and additions to the questionnaire.

The third section of the data collection tool contained a body image assessment tool, a validated tool developed as a culturally relevant instrument for measuring body image dissatisfaction in males and females. It is a figural scale that comprises two sets of nine silhouettes numbered from one to nine. One represents a perceived thin body image, and nine is an extremely fat one. Participants are invited to circle the number of the silhouette they perceive to be their current body image (first set) and later the number corresponding to the silhouette of what they perceive to be their ideal body image (second set). The difference between these rankings informs an existing dissatisfaction with body image, usually related to a slim ideal.

The last section comprised a recording sheet for biometric data, namely, anthropometric measurements (weight, height and waist circumference) and calculated BMI and any ongoing non-communicable disease the patient suffered during the study. The WHO recommended BMI cut-offs and protocol for waist circumference measurement (the midpoint between the lower border of the rib cage and the superior iliac crest) were used to assess the patient's anthropometry and define obesity.

This article was prepared for and formatted according to the author guidelines of the African Journal of Primary Health Care & Family Medicine (https://phcfm.org/index.php/phcfm/pages/view/submission-guidelines)

OBESE PATIENTS REPORTED DISSATISFACTION WITH WEIGHT, BODY IMAGE AND INTERACTION WITH CLINICIANS AT DR YUSUF DADOO DISTRICT HOSPITAL

ABSTRACT

Background: Obesity in South Africa has created a public health crisis that warrants a multilevel intervention. Patients' perceptions and clinicians' challenges hinder the management of obesity in primary care.

Aim: The study aimed to assess obese patients' dissatisfaction with weight and body image and their perspectives on interaction with clinicians in a primary care setting.

Setting: Dr Yusuf Dadoo District Hospital, outpatient department.

Method: Cross-sectional study of 213 adult obese patients. A semi-structured questionnaire, a body image assessment tool and patient medical records were used for data collection.

Results: The study found that, contrary to popular belief, obese patients were dissatisfied with their weight (78.9%) and body image (95.3%). Many felt comfortable discussing weight reduction with clinicians, although 37.1% reported never engaging with a doctor, and 62.9% never interacted with a nurse on the subject. Only six percent reported receiving adequate information on weight reduction measures, and 19.7% were followed-up. Clinicians' advice was mainly associated with patients' high BMI and waist circumference. Doctors were less likely to recommend weight reduction to employed obese women, while nurses were more likely to engage Zulu-speaking patients. Patients were more likely to be followed up if there were young and excessively obese.

Conclusion: The study found that most obese patients were dissatisfied with their weight and body image and perceived their interaction with clinicians inadequate.

Contribution: The study highlights a possible shift in obese patients' weight and body image perception compared to previous reports. It also brings to light clinicians' deficiencies that warrant further education on obesity management.

INTRODUCTION

Background and Literature review

Obesity is an important contributing risk factor to many non-communicable diseases (NCDs), an induction factor for multimorbidity and a challenge for patients and clinicians in primary care practice.[2,3] In 2019, overweight and obesity cost the South African economy about 4.16% of the GDP or R219.15 billion.[4] Prevention and control of overweight and obesity are essential in reducing the burden of non-communicable diseases on strained healthcare systems, especially in countries with limited resources.[3,5]

The South African National Health and Nutrition Examination Survey – First edition (SANHANES-1) report had previously brought to light the crisis level of NCDs and obesity in South Africa[6], and according to the 2016 South African statistics on health survey, about two-thirds of women and one-third of men in the country were overweight or obese.[7] At this level of prevalence, obesity in South Africa has undoubtedly become an epidemic with no downtrend in sight if serious measures are not taken to tackle this significant public health crisis.[3,8,9] As is the case in all epidemics, experts have advocated a multilevel approach to preventing and controlling obesity. This approach involves key players, such as government policymakers, clinicians and patients and their communities, who need to play their roles decisively.[10,11]

Effective government policy implementation is necessary. However, as it has been the case in many other countries, the South African government has recognised the negative impact of obesity on public health and its strain on the health system. Nonetheless, it is still struggling to find the best suitable strategy for preventing and controlling overweight and obesity.[10,12,13]

The role of primary care providers in preventing and controlling overweight and obesity cannot be over-emphasised as they are at the forefront and constitute a key determinant factor in the fight against obesity.[14–17] However, studies have shown that many clinicians experience difficulty integrating weight management into their routine practice.[18–20] Some cannot identify obesity, while others poorly document obesity as a patient's problem that they need to address.[21,22] Some clinicians are biased and demonstrate a negative attitude regarding obese patients' ability or willingness to self-discipline or effectively engage with prescribed measures.[23] In contrast, others express ambiguity

concerning the effectiveness of existing obesity management models.[24] These clinicians' deficiencies significantly hinder their ability to fulfil their role and limit their contribution to the fight against overweight and obesity.

Obese patients and their communities' attitudes contribute to the challenges faced by clinicians in managing obesity at the primary care level. The patient's role and that of their community are crucial for the optimal implementation of measures aimed at preventing and controlling obesity. A weight loss management plan can only be successful if there is buy-in from the patients and the communities that support them.[21] This is even more relevant to the South African context, as studies have demonstrated the impact culture has on individuals' and communities' perceptions of weight in the country.[25,26] It has been shown that many obese patients see themselves as normal, content with excessive weight and show no interest in weight reduction measures.[27,28] This phenomenon is prevalent in patients whose cultural environment has normalised obesity. One highlight of such an environment is the emergence of the body positivity movement worldwide, which critics regard as a counterproductive factor in the fight against obesity.[29] Other obese patients demonstrate poor insight into the health risk associated with obesity and show little appetite to embark on weight reduction measures despite being advised to do so.[27,29] However, recent studies have reported a gradual shift in obese patients' perception of health risks associated with obesity. More patients recognise the need for weight reduction measures. Still, the lack of motivation, the limited knowledge of weight loss strategies, and the limited access to resources and professional assistance continue to hinder their efforts.[27,30,31]

Obese patients' dissatisfaction with their weight and body image remains one of the determinant factors in their decision to participate in weight control measures.[31,32] Although a small proportion of obese patients will attempt to lose weight, studies have shown that few will maintain an ideal weight if professional support is not provided.[33–35] The challenges faced by obese patients in controlling their weight have been partly attributed to a lack of constructive interaction with clinicians.[15,16,20,36]

Aim and objectives

In recent years, within South Africa, few studies have explored obese patients' views on their interaction with clinicians in primary care settings, and no study has so far been done in the West Rand. This study aimed to assess obese patients' dissatisfaction with

weight and body image and their perspectives on interactions with clinicians in a primary care setting. Its first objective was to determine the sociodemographic characteristics of obese patients attending the district hospital's outpatient department. The second was to determine obese patients' dissatisfaction with their weight and body image and how comfortable they were discussing weight management with clinicians. The third objective was to evaluate obese patients' views on their interaction with clinicians regarding weight reduction advice as well as factors that influence clinicians' provision of advice for weight reduction and follow-up.

METHODOLOGY

Study design

This was a cross-sectional study.

Study setting

The study was conducted in the outpatient department at Dr Yusuf Dadoo District Hospital, a level one hospital with 175 acute beds capacity located in Mogale City, west of Gauteng. Several regional primary healthcare centres feed the hospital, and its catchment area comprises a low and middle-income population of about 649 751 and a mixed cultural divide.

Study population

The study population included obese patients aged 18 years and above, attending the district hospital outpatient department, chronic section. Patients were excluded if they were very ill, pregnant or had an ongoing unstable psychiatric condition. The World Health Organisation (WHO)'s definition criteria of obesity (Body Mass Index (BMI) of more than 30 kg/m^2 or a waist circumference (WC) of 102 cm or more for men and 88 cm^2 or more for women)[37] was used.

Sampling strategy

In 2016 the WHO reported that 28.3% of the adult population in South Africa was obese.[38] The calculated sample size was 213 based on the above–estimated population proportion with a confidence interval of 95% and a margin error of 0.05. As the study was conducted in a predominantly chronic outpatient department, the sample was

adjusted to a finite population of 680, corresponding to the average number of chronic patients seen monthly in the district hospital's outpatient department.

Selection of participants

Consecutive patients in a convenient sample were purposively selected for their weight status. The principal investigator collaborated with the nursing staff at the outpatient department. While collecting vital signs, the nurse invited patients to participate in the study if they fulfilled the inclusion criteria. Those who agreed were directed to a separate room where a research assistant obtained informed consent and gave them the study questionnaire. The research assistant assisted patients who had difficulty reading or writing in completing the questionnaire. After completing the questionnaire, the patient was directed to the consulting room, where the principal investigator attended to the reason for the encounter and recorded the biometric data.

Data collection tool

The data collection tool had four sections – the first comprised anonymised respondents' demographic details. The second contained a semi-structured questionnaire related to the patient's dissatisfaction with weight, how comfortable they were, discussing weight reduction measures with a clinician, and their perspectives of interaction with clinicians regarding weight reduction advice and subsequent follow-ups. This questionnaire was an adapted version of a questionnaire used by Thomas and colleagues.[1] Although the questionnaire was used as part of a qualitative study, it was well-tailored to answer our primary research questions after adaptation. As part of the adaptation, Thomas and colleagues' focus group questionnaire was used as a foundation for our structured questionnaire. In contrast, the author changed the body image assessment tool used in the study to a more culturally relevant and gender inclusive.

The structured questionnaire was piloted at the study site to test its feasibility and relevance in our study setting. Seven patients participated in the pilot study and some changes were made. Also, as a result of the pilot study, the questionnaire was translated into Afrikaans to accommodate the big proportion of Afrikaans-speaking participants who could not be assisted by the research assistant, who was more fluent in Setswana and isiZulu. The piloted number was not added to the final sample due to the substantial amendments and additions.

The third section of the data collection tool contained a body image assessment tool, a validated tool developed as a culturally relevant instrument for measuring body image dissatisfaction in males and females. It is a figural scale that comprises two sets of nine silhouettes numbered from one to nine. One represents a perceived thin body image, and nine is an extremely fat body. Participants were invited to first circle the number of the silhouette they perceive to be their current body image (first set) and later the number corresponding to the silhouette of what they perceive to be their ideal body image (second set). The difference between these rankings indicates an existing body image dissatisfaction, usually related to a slim ideal[39]. The last section comprised a recording sheet for biometric data, namely, anthropometric measurements (weight, height and WC) and calculated BMI and any ongoing non-communicable disease the patient suffered during the study. The WHO recommended BMI cut-offs and protocol for WC measurement (Midpoint between the lower edge of the rib cage and the crest of the ilium) were used to assess the patient's anthropometry and define obesity[40].

Data processing and analysis

Collected data were computed in Microsoft Excel. Each categorical variable was coded based on a pre-defined code sheet arranged by the principal investigator to minimise errors before uploading it into Stata Statistical Software version 16.1, 2019 release for analysis. Continuous variables were reported as median and ranges, and categorical variables as frequency and percentage. The International Atherosclerosis Society (IAS) and International Chair on Cardiometabolic Risk (ICCR) 's consensus statement on waist circumference were used to categorise WC by cardiovascular(CVD) risk.[41] To measure body image dissatisfaction, the authors calculated the absolute difference between the numbers corresponding to the current perceived body image and the ideal body image on the body assessment tool. Any result above one indicated dissatisfaction, and any below suggested no dissatisfaction. Obese patients' perspectives on their interaction with clinicians were assessed using reports of advice on weight reduction and follow-up after the initial discussion. Chi-squared tests were performed to determine any association between patients' characteristics and their interaction with clinicians. A two-step logistic regression was performed, and its results are reported as odds ratios (OR), confidence intervals (95% CI) and *p*-values (*p*). Univariate logistic regression models were conducted to assess whether patients' characteristics influenced clinicians' advice on weight reduction and subsequent follow-

up. Multivariate logistic regression models were performed to control confounders by adjusting statistically and clinically significant factors. A p-value <.05 was deemed statistically significant.

Ethical Considerations

The study proposal was submitted to the Wits Human Research Ethics Committee for ethics clearance and was approved under the protocol reference number M200118. Permission was also obtained from the Gauteng province and Dr Yusuf Dadoo hospital management. All study participants provided written consent and were informed of their participation's voluntary nature and their right to withdraw at any time with no impact on the service they ought to receive. The data collection sheet and questionnaire were anonymised.

RESULTS

Data collection was conducted over a period of three months. Two hundred thirty patients were eligible for participation in the study. Five severely ill and two pregnant patients were excluded. Altogether 223 patients were invited, but ten declined, leaving 213 participants. No reason for the refusal was asked, as it was the patient's right to refuse.

Sociodemographic characteristics of patients

Obese patients' baseline characteristics (Table 1) show that the median age was 53 years, ranging from 23 to 75 years. Most obese patients attending the hospital's outpatient department during the study were aged 46 to 55 years (67; 31.5%) and 56 to 65 years (63; 29.6%). There were more women (153; 71.8%) than men (60; 28.2%). Most were Tswana speaking (69; 32.4%), followed by Afrikaans (59; 27.7%). Eighty-seven patients were married (40.8%), and 147 (69%) had completed secondary school. One hundred and twenty-five were employed (58.7%). There were 168 (78.9%) severely obese patients with BMIs of 35kg/m^2 or above, and 85 (39.9%) were extremely obese (BMI ≥40kg/m^2). CVD risk stratification related to waist circumferences showed that 169 (79.34%) patients had extremely high CVD risk. Eighty-seven patients (40.8%) had a metabolic disease, and 73 (34.27%) were multimorbid.

Table 1: Sociodemographic characteristics of patients (n=213)

Baseline characteristics	Level	Frequency	Percentage
Age (years) Median: 35(23-75)	18-25	1	0.5
	26-35	19	8.9
	36-45	36	16.9
	46-55	67	31.5
	56-65	63	29.6
	> 65	27	12.7
Gender	Women	153	71.8
	Men	60	28.2
Language	Setswana	69	32.4
	Afrikaans	59	27.7
	isiZulu	25	11.7
	Sotho	14	6.6
	Xhosa	18	8.5
	Sepedi	6	2.8
	Ndebele	5	2.4
	English	10	4.7
	Venda	7	3.3
Marital status	Single	33	15.5
	Married	87	40.9
	Divorced	31	14.6
	Living together	29	13.6

	In relationship	10	4.7
	Widowed	23	10.8
Education	No formal education	8	3.8
	Primary school	28	13.2
	Secondary school	147	69
	Tertiary education	30	14.1
Employment status	Employed	125	58.7
	Unemployed	54	25.5
	Pensioner/Retired	34	16
BMI (kg/m^2) Median: 38.5(31.5-63.7)	Class 1 (30-30.9)	45	21.1
	Class 2 (35-39.9)	83	39
	Class 3 ($\geq$ 40)	85	40
WC (cm) Median: 126(107-173)	Very high CVD risk (Female≥105; Male ≥110)	44	20.7
	Extremely High CVD risk (Female≥115; Male ≥125)	169	79.3
Comorbidities	Metabolic disease	87	40.9
	Multimorbidity	73	34.3
	Cardiovascular	36	16.9
	Respiratory diseases	8	3.8
	Musculoskeletal disease	3	1.4
	Cancer	2	0.9
	Other	4	1.9

Most obese patients reported a great level of dissatisfaction with their weight and body image (Table 2). Of these, 168 (78.9%) expressed unhappiness with their current weight, 199 (93.4%) had thought of losing weight, 156 (73.2%) reported previous weight loss attempts, and 203 (95.3%) expressed dissatisfaction with their current body image.

Table 2: Obese patients' level of dissatisfaction with weight and body image (n=213)

Variables	Responses	Frequency	Percentage	OR (95%CI)	*p*-Value
Current feelings about weight	Happy	45	21.1	0.07(0.04−0.11)	< .001
	Not happy	168	78.9	13.94 (8.75−22.19)	
Ever thought of losing weight	No	14	6.6	0.004 (0.00−0.01)	< .001
	Yes	199	93.4	202 (93.88−434.81)	
Ever attempted to lose weight	No	57	26.8	0.13 (0.09−0.21)	< .001
	Yes	156	73.2	7.49 (4.88−11.5)	
Dissatisfied with body image	No	10	4.7	0 (0.00−0.10)	< .001
	Yes	203	95.3	412 (167−1011.4)	

Table 3 documents obese patients' reported comfort when discussing weight management and interaction with clinicians. Altogether, 197 (92.5%) patients were comfortable discussing weight management with a doctor, and 210 (98.6%) were happy discussing it with a nurse. Seventy-nine (37.1%) patients reported never being engaged by a doctor, and 134 (62.9%) never engaged with a nurse. Hundred-and-eleven (52.1%) obese patients who were either engaged by a doctor or a nurse reported not receiving information on how to lose weight, and 89 (41.8%) thought they were not given enough information. Hundred-seventy-one (80.3%) patients said no clinician followed up with them after an initial weight loss discussion.

Table 3: Obese patients' reported comfort in discussing weight management and interaction with clinicians (n=213)

Variables	Responses	Frequency	Percentage	OR(95%CI)	*p*-Value
Comfortable discussing weight management with a doctor	No	16	7.5	0.0 (0.0−0.01)	< .001
	Yes	197	92.5	151.6(73.7−311.6)	
Comfortable discussing weight management with a nurse	No	3	1.4	0.0 (0.0−0.001)	< .001
	Yes	210	98.6	4900 (977−24556)	
Have been told by a doctor to lose weight	Never	79	37.1	0.35 (0.23−0.51)	< .001
	Yes	134	62.9	2.88 (1.94−4.26)	
Have been told by a nurse to lose weight	Never	134	62.9	2.88 (1.94−4.26)	< .001
	Yes	79	37.1	0.35 (0.23−0.51)	
Information received on how to lose weight	None	111	52.1	72.9 (32.35−164.3)	< .001
	Not enough	89	41.8	46.9 (20.6−106.7)	<.001
	Enough	13	6.1	0.01 (0.00−0.03)	< .001
Followed-up after weight loss discussion	Never	171	80.3	4 (2.67−5.98)	< .001
	Yes	42	19.7	0.25 (0.17−0.37)	

Association between obese patients' characteristics and interactions with clinicians

Chi-squared test results showed that doctors' provision of advice on weight loss was significantly associated with patients' BMI (p < .001) and WC (p< .001). In contrast, nurses' advice was associated with patients' language (p = .007), BMI (p= .004) and WC size (p= 0.01). A significant association was also found between the amount of information received for weight reduction and patients' age (p= .013), BMI (p< .001) and WC (p< .001). There was no association between obese patients' medical conditions and the information received. Follow-up of patients after the initial provision of advice on weight reduction was significantly related to the patient's age (p= .006), BMI (p= .001) and WC size (p= .004).

Factors influencing clinicians' provision of advice on weight reduction

Results of logistic regressions suggested that patients were more likely to be advised by doctors to lose weight if they were morbidly obese (Class 3 BMI) (OR=4.5; 95% CI: 2.03–10.02; p= .001) and had a severely large WC, (OR=3.6; 95% CI: 1.79–7.12; p< .001). After adjusting for age, sex and medical conditions, results demonstrate that high BMI and severely large WC still positively influenced doctors advising weight loss (OR=3.6; 95% CI: 1.34–9.88; p= .011) and (OR=4.714; 95% CI: 1.64–13.58; p= .004). When controlling for occupation, BMI and WC, women became less likely to be advised by a doctor to lose weight (OR=0.42; 95% CI: 0.18–0.97; p= .042)

Patients who spoke Zulu were 6.3 times more likely to be advised by nurses to lose weight (OR= 6.3; 95% CI: 2.28–17.41; p< .001) than their counterparts. Those who had morbid obesity were 2.5 times more likely (OR= 2.5; 95% CI: 1.16–5.46; p= .019), and those with severely large waist sizes were 2.8 times more likely (OR=2.8; 95% CI: 1.243–6.082; p= .013). The results also show that divorced and widowed patients were less likely to be advised by nurses to lose weight (OR= 0.29; 95% CI: 0.1–0.83; p= .022) and (OR=0.29; 95% CI: 0.09–0.93; p= .038). These factors remain unaffected after controlling for age, sex, education, employment status and medical condition.

Factors influencing clinicians' follow-up of obese patients after prior advice for weight reduction

Logistic regression analysis showed that young patients aged 26–35 were 18.9 times more likely to be followed up after initial advice to lose weight than their counterparts

(OR= 18.9; 95% CI: 2.1–169.8; *p*= .009). Those with class 3 BMI were three times more likely to be followed up (OR= 3; 95% CI: 1.1–8; *p*= .026), while those with very large WC were also 3.6 times more likely to be followed up (OR= 3.6; 95% CI: 1.8–7.1; *p*< .001).

DISCUSSION

This study aimed to assess obese patients' dissatisfaction with weight and body image and their perspectives on interaction with clinicians in a primary care setting. The findings demonstrate that most obese patients attending the district hospital's outpatient department, chronic section, were middle-aged adult women. Most of the patients spoke Tswana and Afrikaans, had completed secondary school and were employed. A large proportion of patients were married, severely obese, and demonstrated a very high level of CVD risk. The majority either suffered from metabolic disease or were multimorbid. These findings are broadly consistent with the 2016 Statistics South Africa report on health surveys concerning obesity[7]. Although the survey did not account for the employment and marital status of obese individuals, it showed that obesity was associated with a high level of wealth. These findings are also consistent with trends previously reported in South Africa and other parts of the world[7,8,42].

Popular beliefs and previous studies showed that larger body size is socially or culturally accepted and has been normalised in many parts of South Africa and the world.[30,31] In sharp contrast, this study's findings show that most obese patients reported unhappiness with their current weight and perceived body image. Many stated they had thought of losing weight, and a significant proportion reported having previously attempted weight reduction.

With the above in mind ,these findings partly diverged from the SANHANES-1 report on weight management and body image, which showed that most South Africans were happy with their body size, although only 42% of the study participants correctly linked their desired body size with their perceived one[6], thus demonstrating a greater level of body image dissatisfaction. The discrepancy between the current study results and those previously reported in the literature could be explained by increased public awareness of the risk associated with obesity and the desire to stay fit and healthy.[30–32] Also, the emerging shift in attitude to excessive weight as more people are exposed to western media that portrays slimness as ideal and fashionable[43]. A good example is the emerging popularity of 'fitspiration' or 'fitness inspiration', promoting healthy living

through exercise and a healthy diet.[44] However, a counterargument to this is the increase in the number of social media exposés that support the body positivity movement, which promotes the acceptance of each body type and size[29], though critics consider this as a way of promoting obesity and unhealthy behaviour. This ambiguity in the social media environment has been highlighted recently.[29,44,45]

Most patients in the study were comfortable discussing weight reduction measures with clinicians, largely with nurses, than with doctors, although they mostly received advice from doctors and less from nurses. It is worth noting that the large confidence interval on the comfortability of obese patients to discuss weight management with a nurse may be due to the study's small sample size. Nevertheless, these findings demonstrate a possible underutilisation of the full potential of nurse-led intervention in the fight against obesity at the primary care level, which has been shown to be effective in other parts of the world[46]. Moreover, even though all the patients in the study sample were recommended by a clinician to lose weight at some point, only six percent thought the information received was adequate. Most patients either received no information or found it insufficient to help them succeed with weight loss. In addition, the amount of information received was significantly associated with the patient's age, BMI and WC. These findings highlight discrepancies between obese patients' expectations of the clinicians' role and the level of assistance they receive in clinical practice.[15,24,47] They further demonstrated the need for clinicians to adjust their attitude to obese patients' willingness to engage in weight reduction measures and to consider improving the quality of care provided to the obese population.[23,24,48]

The study results suggested that clinicians' advice for weight reduction was significantly associated with morbid BMI and severely large WC. These findings corroborate previous reports, showing that primary care clinicians tended to manage obesity proactively when patients were perceived to be in a morbid state or had accumulated extremely severe CVD risk[18]. It has also been found that clinicians often underestimate their role in preventing and controlling overweight and obesity.[15,49,50]

This role clinicians could play was highlighted when adjusting BMI and WC with employment status; employed obese women were less likely to be advised by doctors to lose weight. This is in sharp contrast with previous findings, suggesting that patients with better socioeconomic status were more likely to engage healthcare providers about

weight management.[51] It has also been shown that compared to men, employed obese women are more likely to be absent from work due to weight-related problems.[52]The researcher speculates that the study's finding of discriminatory attitude on the part of the doctors toward employed, obese women could be explained by the high ratio of male to female doctors who have to engage a majority of female patients on a sensitive subject such as obesity.[53] However, further studies are needed in this regard.

Nurses' advice was also strongly related to the patient's language and marital status. They were 6.3 times more likely to advise patients who spoke Zulu and less likely if patients were divorced or widowed. These findings highlight the previously reported bias clinicians demonstrate in the management of obesity.[16,54] However, they also highlight the need for tailored, culturally sensitive interventions in managing obesity. Several authors have previously advanced this argument, although others found this had little effect on obesity prevention and control.[55–57]

The study found that one out of five patients advised losing weight reported having been followed up, and this follow-up was more likely to occur if patients were young and morbidly obese. These findings further demonstrated that, while clinicians could initiate discussion on weight reduction, the benefit to obese patients was minimal due to the information provided and the lack of follow-up to optimise patients' weight reduction measures. Previous studies have attributed clinicians' inability to provide adequate information and follow-up of obese patients to their biased attitude, limited knowledge, poor understanding of their role and deficiencies in the healthcare systems.[15,19,20,34]

The literature suggests that clinicians' and obese patients' challenges in addressing obesity in primary care can be due to multiple factors, such as time constraints, clinicians' and patients' attitudes towards obesity, clinicians' level of knowledge and experience and the availability of resources.[18–25] This study's findings have highlighted previously reported trends in managing obesity at the primary care level. However, it has also brought some new results that contradict previous beliefs and others that warrant further studies.

Strengths and limitations

This is the first study in West Rand exploring the relationship between obese patients' dissatisfaction with weight and body image and their perspective of interaction with clinicians at the primary care level. It may be the first of its kind in South Africa.

The study focused on the frequency of weight and body image dissatisfaction and did not account for the reasons. Convenience sampling was the most appropriate method for the selection of participants, given the study's well-defined target population and the researcher's familiarity with the setting. To minimise effect of convenience sampling on reliability, the nursing team invited every consecutive patient who responded to the inclusion criteria. Consecutive sampling limits selection and researcher bias. While information or social desirability bias could have affected the validity of patients' reported information, the researcher and research assistant ensured that patients' anonymity and confidentiality were always kept, minimising self-reporting and social desirability bias during data collection. The study demonstrates a high prevalence of weight and body image dissatisfaction in the obese population attending the district hospital. However, these findings should be interpreted in the context of a mixed cultural divide, which characterises the study site since ethnicity has been shown to affect obesity perception. Also, while the study findings might suggest a societal shift in obesity perception, this needs to be tested in more settings before generalisation.

Recommendations

Obese patients perceived inadequacies in their interaction with clinicians at the district hospital's outpatient department can be improved by training clinicians on obesity awareness and communication skills and by ensuring that a more patient-centred approach is applied during clinical encounters. The district hospital's clinical team should implement a contextualised clinical guideline based on the national strategic approach for controlling and preventing obesity to assist clinicians in their daily practice. The diverging high rate of weight and body image dissatisfaction among obese patients in the study compared to previous reports might signal a social shift in obesity perception that warrants large-scale investigations such as a second SANHANES study. Also, further studies are required to explore why doctors are less likely to recommend weight loss to employed, obese women.

CONCLUSION

This study's findings have shown that, contrary to popular belief, most obese patients were dissatisfied with their weight and body image. Obese patients perceive inadequate interactions with clinicians at the district hospital regarding the level of help they need

to achieve satisfactory weight loss. The study results also demonstrate that obesity management in primary care demands further clinicians' education.

COMPETING INTERESTS

The author declares that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

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DATA AVAILABILITY STATEMENT

The data supporting this study's findings are available on request from the corresponding author. The data are not publicly available due to ethical restrictions.

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APPENDICES

Appendix I: List of Tables

Table 1: Sociodemographic characteristics of patients

Table 2: Obese patients' level of dissatisfaction with weight and body image

Table 3: Obese patients' reported comfortability to discuss weight management and interaction with clinicians.

Appendix II: Questionnaire

DEMOGRAPHIC DATA (PARTICIPANT)

Please complete the following questionnaire anonymously

Please mark the applicable answer(s) with an "X." Indicate ONLY ONE answer.

Date		Hospital Name	

1	What is your first language	

2	Sex	Male	
		Female	

3	Age	

4	Please indicate how far you completed school	

5	Marital status	Single	
		Promised/ engaged	
		Living together	
		Married	
		Divorced	
		Others	

WEIGHT RELATED QUESTIONNAIRE

Please mark the applicable answer(s) with an "X." Except for questions No 4,7-10, and 20,

N0	QUESTIONS	ANSWERS			
1	Compared to most of your friends, family, or co-workers, how do you find your weight?	About the same	Larger	Smaller	Other-Describe
2	Do you think anyone has ever judged you without knowing you, based on your weight?	NO	POSSIBLY	YES	
3	Do you think there is a relationship between a person's weight and their health?	NO	POSSIBLY	YES	
4	If yes or possibly, name one or more health problems that you believe are caused or made worse by overweight?				
5	Do you think there is any relationship between your weight and your health problem?	NO	POSSIBLY	YES	
6	Have you ever attempted to lose weight since your health problem was discovered?	NO	YES	STILL TRYING	
7	If you tried, when was it?				
8	If you tried, how much did you lose?				
9	If you tried, what went wrong				
10	If you NEVER tried, why?				
11	Do you think the discovery of your health problem played a part in your attempt to lose weight?	NO	POSSIBLY	YES	
12	Do you think you would be able to lose weight if you tried or tried again?	NO	POSSIBLY	YES	
13	What would you do to lose weight?	Exercise			
		Change eating habits			
		Both			
		Other:			

14	What do you think is the greatest barrier to you losing weight or adopting a lifestyle that helps control your weight? **-Tick the one answer you can identify with the most.** **- Please specify if you chose "Other"**	Don't know how to lose weight	
		Do not feel motivated	
		Don't have money	
		Don't have support	
		Don't have time	
		Happy with my weight	
		It will not change my health	
		I like eating nice food	
		My partner doesn't want me to lose weight	
		People will think I am sick	
		I am too sick to exercise	
		You just again pick up the weight you lost after time	
		Other :	

15	Have you ever been told either directly or indirectly by a family member or a friend that you need to lose weight?	NO	Sometimes	YES
16	If Yes, how did you feel about?	Annoyed	Encouraged	Upset
17	How would your family or friends react to your attempt to lose weight?	They will be happy	They will not care	They will not want me to lose weight

18	Have you ever been told by a doctor or a nurse that you need to lose weight?	Never	Many times	Once or Twice
19	Do you feel comfortable talking about your weight problems with a doctor or a nurse?	Happy	Not Happy	unbothered
20	If Yes, do you think you were given enough information or support to help you lose weight?	Enough	Not Enough	None
21	Did any of the doctor or nurse follow up on your weight after s/he discussed it with you?	Never	Regularly	Sometimes
22	How would you have liked the doctor or the nurse to help you with your attempt to lose weight? **- Tick the answers that you can identify with the most.** **- Please specify if you chose "Other"**	Discuss a plan		
		Give me a pill		
		Tell me how and what to eat and drink		
		Tell me how to exercise		
		Check on me regularly		
		Build a relationship with me		
		The doctor or nurse cannot help me		
		Other:		

BIOMETRIC DATA SHEET

TO BE COMPLETED BY THE RESEARCHER OR RESEARCH ASSISTANT

Please mark the applicable answer(s) with an "X" and copy information from the patient file.

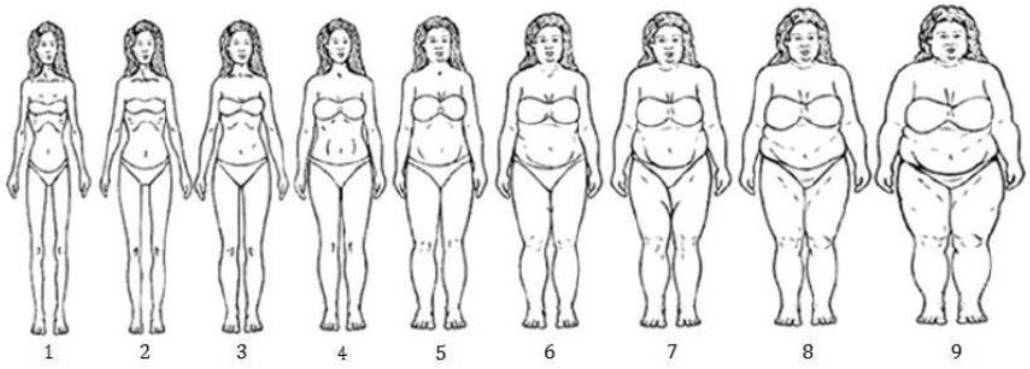
1. Medical condition(s)

Patient's condition(s)		Date Discovered (Months / Years)
1.1	Diabetes	
1.2	High Blood Pressure	
1.3	Other Cardiovascular Disease	
1.4	Dyslipidaemia	
1.5	Osteoarthritis	
1.6	Asthma	
1.7	Cancer	
1.8	Others (Specify)	

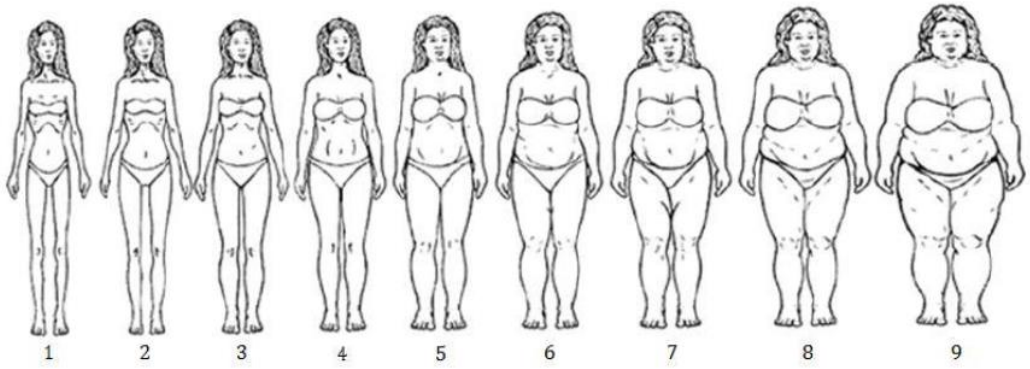
2. Patient's anthropometric records

2.1	Weight	
2.2	Height	
2.3	Calculated BMI	
2.4	Waist Circumference	

Figure 1: BODY IMAGE ASSESSMENT TOOL (Female)



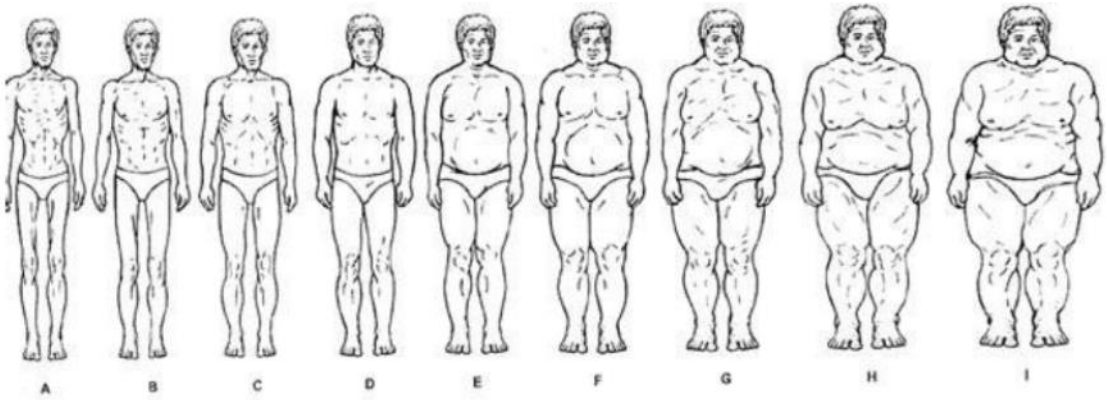
Circle the number of the figure that most closely represent how you look **now**



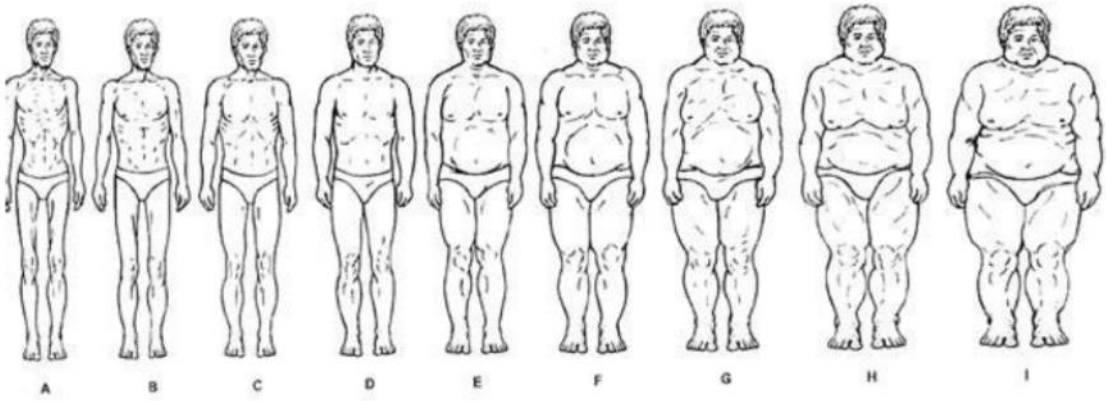
Circle the number of the figure that most closely represent how you **would like** to look

Reference:
Pulvers KM et al. Development of a culturally relevant body image instrument among urban African Americans. Obesity Research. 2004;12(10):1641–51.

Figure 2: BODY IMAGE ASSESSMENT TOOL (Male)



Circle the number of the figure that most closely represent how you look **now**



Circle the number of the figure that most closely represent how you **would like** to look

Reference:
Pulvers KM et al. Development of a culturally relevant body image instrument among urban African Americans. Obesity Research. 2004;12(10):1641–51.

Appendix III: Information Sheet and Consent forms

PATIENT INFORMATION SHEET AND CONSENT FORM

Good Day,

I am Dr Buhendwa Kanozire, a registrar in the Department of Family Medicine at the University of the Witwatersrand, assigned to the West Rand Health District. I am currently heading a team conducting a research study titled "*Obese patients' perception of weight, barriers to weight reduction and preferred medical interventions at Dr Yusuf Dadoo Hospital*".

Why are we doing this? At the end of this research, doctors and nurses will have a better understanding of the challenges that face patients who present with excessive weight and will be better prepared to manage them.

What do we expect from you? With your permission, you will be asked to anonymously complete a demographic form, a questionnaire and a form with images to choose from. Next, the doctor will check your file and collect your weight, height and waist circumference measured by the nurse, as well as any non-communicable disease you might be suffering from. Kindly ask if you do not understand a question.

Are there benefits or risk to the participants? There is a benefit to you because any spotted abnormality detected during this process will be attended to by the doctor. To the best of our knowledge, there is no physical risk to the participants, although we recognise that some patients might feel uncomfortable when discussing their weight-related challenges.

What about confidentiality? Confidentiality will be maintained at all time. All the forms and questionnaire used are anonymous and self-administered, meaning we will not record your name, nor your date of birth. The results will be anonymously published in a medical journal.

Should you have any queries, more information may be obtained from Dr. B. Kanozire on this number: 011-951-6000. Read and sign the consent form below if you are happy to participate in this study.

Thank you,

Dr B. Kanozire.

Consent form

I consent to take part in this research, as outlined in the information sheet above.

I understand that I am free to withdraw from the research at any time without penalty.

It has been explained to me that the purpose of the research is to help health care providers better understand the challenges that face patients presenting with excessive weight.

I understand that the confidentiality of my records will be maintained by the anonymous nature of data collection.

I have had the opportunity to ask questions

Patient's
name.....Signature.....Date.....

Witness .....

Appendix IV: Ethical Clearance Certificate

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

Office of the Deputy Vice-Chancellor (Research & Post Graduate Affairs)

TO: Dr B Kanozire
School of Clinical Medicine
Department of Medicine
Division of Family Medicine
Medical School
University

E-mail: olivierbuhendwa@gmail.com

CC: Supervisor: Ms D Pretorius <Deidre.Pretorius@wits.ac.za>
and <HREC-Medical.ResearchOffice@wits.ac.za>

FROM: Iain Burns
Human Research Ethics Committee (Medical)
Tel: 011 717 1252

E-mail: Iain.Burns@wits.ac.za

DATE: 2020/06/12

REF: *R14/49*

PROTOCOL NO: **M200118** *(This is your ethics application study reference number. Please quote this reference number in all correspondence relating to this study)*

PROJECT TITLE: *Obese patients' perception of weight, barriers to weight reduction and preferred medical interventions at Dr Yusuf Dadoo Hospital*

Please find attached the Clearance Certificate for the above project. I hope it goes well and that an article in a recognized publication comes out of it. This will reflect well on your professional standing and contribute to the Government funding of the University.

MSWorks2000/Iain0007/Clearscan.wps

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

R14/49 Dr B Kanozire

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
CLEARANCE CERTIFICATE NO. M200118

NAME: (Principal Investigator) Dr B Kanozire

DEPARTMENT: School of Clinical Medicine
Department of Medicine
Division of Family Medicine
Medical School
University

PROJECT TITLE: Obese patients' perception of weight, barriers to weight reduction and preferred medical interventions at Dr Yusuf Dadoo Hospital

DATE CONSIDERED: 2020/01/31

DECISION: Approved unconditionally

CONDITIONS:

SUPERVISOR: Ms D Pretorius

APPROVED BY: Dr CB Penny, Chairperson, HREC (Medical)

DATE OF APPROVAL: 2020/06/12

This clearance certificate is valid for 5 years from the date of approval. Extension may be applied for.

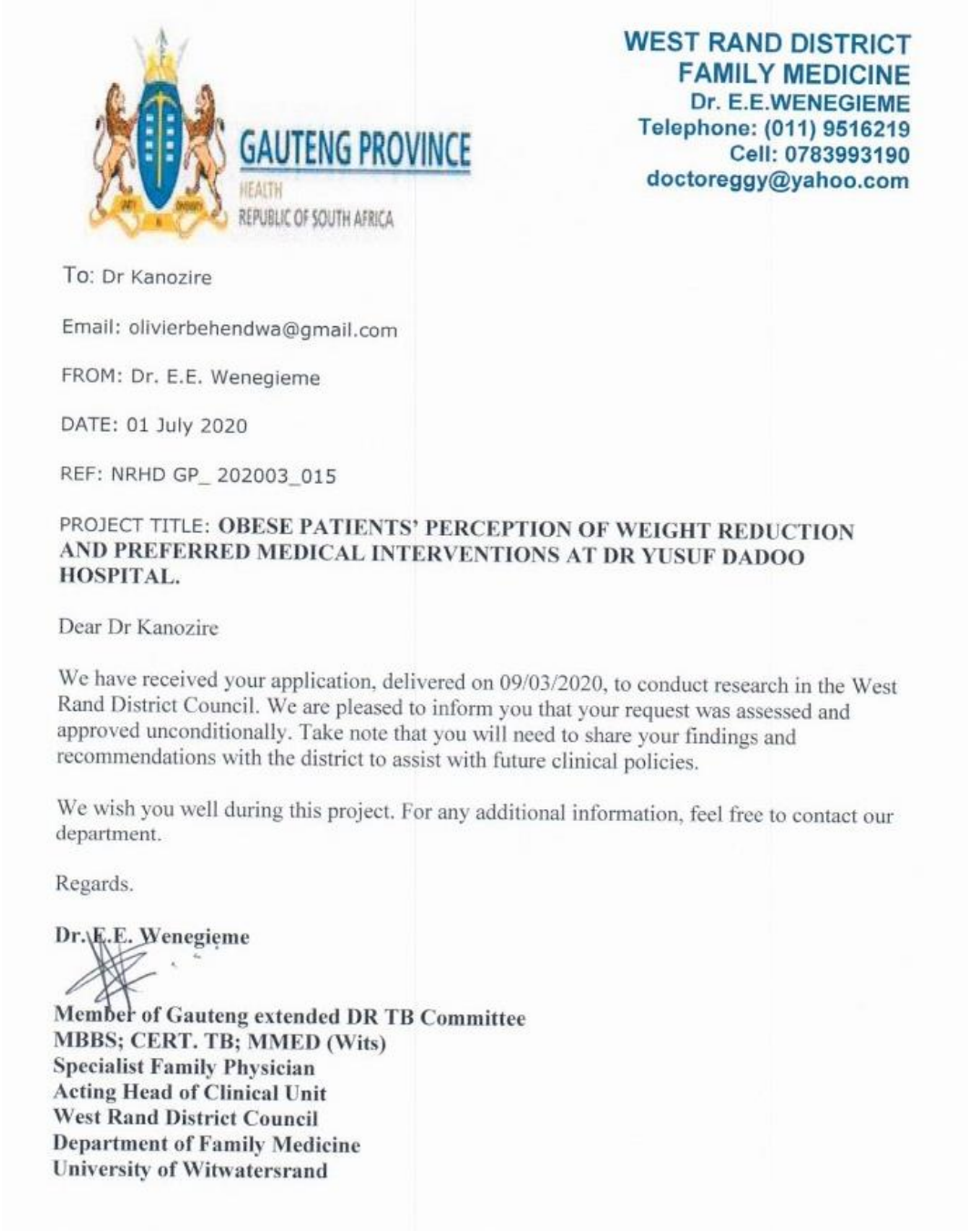
DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on the 3rd Floor, Phillip Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.
I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to submit details to the Committee. **I agree to submit a yearly progress report**. When a funder requires annual re-certification, the application date will be one year after the date when the study was initially reviewed. In this case, the study was initially reviewed in **January** and will therefore reports and re-certification will be due early in the month of **January** each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature

10-07-2020
Date

Appendix V: Provincial and district permissions



GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

WEST RAND DISTRICT
FAMILY MEDICINE
Dr. E.E.WENEGIEME
Telephone: (011) 9516219
Cell: 0783993190
doctoreggy@yahoo.com

To: Dr Kanozire

Email: olivierbehendwa@gmail.com

FROM: Dr. E.E. Wenegieme

DATE: 01 July 2020

REF: NRHD GP_ 202003_015

PROJECT TITLE: **OBESE PATIENTS' PERCEPTION OF WEIGHT REDUCTION AND PREFERRED MEDICAL INTERVENTIONS AT DR YUSUF DADOO HOSPITAL.**

Dear Dr Kanozire

We have received your application, delivered on 09/03/2020, to conduct research in the West Rand District Council. We are pleased to inform you that your request was assessed and approved unconditionally. Take note that you will need to share your findings and recommendations with the district to assist with future clinical policies.

We wish you well during this project. For any additional information, feel free to contact our department.

Regards.

Dr. E.E. Wenegieme

Member of Gauteng extended DR TB Committee
MBBS; CERT. TB; MMED (Wits)
Specialist Family Physician
Acting Head of Clinical Unit
West Rand District Council
Department of Family Medicine
University of Witwatersrand

Appendix VI: Hospital Permission

Department of Health

OFFICE OF THE CHIEF EXECUTIVE OFFICER
DR. YUSUF DADOO HOSPITAL

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

ENQUIRIES	:	P.M. Sofohlo
TELEPHONE	:	(011) 951-6161
FAX	:	(011) 953 5952
Cell	:	083 302 7153
E mail	:	SofohloP@gpg.gov.za
REF NO	:	1/7/2/1
Date	:	27.11.2019

Attention Dr. B. Kanozire

RE: PERMISSION TO CONDUCT RESEARCH AT DR. YUSUF DADOO HOSPITAL

Research Title: Obese patients 'perception of weight, barriers to weight reduction and preferred medical interventions at Dr. Dr. Yusuf Dadoo Hospital

Permission is hereby given to you Dr. B. Kanozire to access Dr. Yusuf Dadoo Hospital and conduct research on the above-mentioned topic.

Please consider the following:

- You will report to the office of the Chief Executive Officer **(CEO)** before initiating the study.
- Participants' rights and confidentiality will be maintained at all the time.
- You will submit a copy (electronic and hard copy) of your final research report to the office of the Chief Executive Officer **(CEO)** of Dr. Yusuf Dadoo Hospital.

You are therefore expected to adhere and comply with the Ethics of research as stipulated in the research policy.
I reserve the right to withdraw my permission grated to you, if you breach any of the conditions mentioned above.

Thank you very much for choosing Dr. Yusuf Dadoo Hospital to conduct such an important study. I wish you good luck in your research.

Regards

Patrick Mbeko Sofohlo
Chief Executive Officer (Dr. Yusuf Dadoo Hospital)
Date: 2019/11/27

DR. YUSUF DADOO HOSPITAL
PRIVAATSAK/PRIVATE BAG X2006
2019 -11- 27
KRUGERSDORP 1740
CHIEF EXECUTIVE OFFICER

Dr. Yusuf Dadoo Hospital, Cnr. Hospital & Memorial Avenues, Krugersdorp, 1740

Appendix VII: Research Proposal

OBESE PATIENTS PERCEPTION OF WEIGHT, BARRIERS TO WEIGHT REDUCTION AND PREFERRED MEDICAL INTERVENTIONS AT DR YUSUF DADOO HOSPITAL

Buhendwa Kanozire
Student Nº: 2061768

Supervisor: Deidre Pretorius
Co-Supervisor: Dr Moshe Magethi

Research protocol submitted to the Faculty of Health Science, University of the Witwatersrand, in partial fulfilment of the requirements for MMed - Family Medicine

Johannesburg, 2019

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1. INTRODUCTION

1.1 Rationale and Background

Obesity has become a global public health threat, and South Africa ranks high among leading countries in the prevalence of the now pandemic disorder[1,2]. According to the 2016 South African Health Survey, there has been a steady increase in the number of obese people across all spheres of society with 68% of women and 31% of men being either overweight or obese[3,4]. In a 2007 study assessing risk factors for early death and disability-adjusted life years (DALYS) in South Africa, obesity ranked fifth[5]. With multiple disease burdens, the South African health system had been under enormous strain to contain the effects of chronic conditions on limited healthcare resources[6]. The emergence of obesity as a disease entity and a key risk factor for various Non-Communicable Diseases (NCDs) such as diabetes, cardiovascular diseases, certain cancers, osteoarthritis, and decreased functional status has led the South African National Department of Health (NDoH) to adopt the World Health Organisation (WHO) recommendations for the management of overweight and obesity[7]. In 2013 the NDoH approved the 2015-2020 Strategic Plan for the Prevention and Control of Overweight and Obesity[8], with so far modest results.

Despite being well researched, obesity still constitutes a challenging subject in clinical practice. Some clinicians are still struggling to apprehend the best way to approach and manage obesity[9–12]. Sedentary life and poor dietary discipline are known as significant risk factors for overweight and obesity, but several studies have shown that obesity perception plays a vital role in weight control and influences an individual's commitment to weight loss[13–15]. Furthermore, weight perception is associated with factors such as sex, ethnicity, socio-economic status, socio-cultural practice, and psychogenic influence of

self-image[15–18]. It also has been found that obese patients are more prone to adhere to culture-sensitive[19] and more individualised intervention, although this is sex dependant[13,18,20].

Studies have shown that in clinical practice, obesity management is often superficial, and many health care providers do not focus on reducing the influence of weight perception and other potential barriers the patient might be facing in their attempt to lose weight as most consider obese patients to lack self-discipline and to be unenthusiastic about following up on recommendations[10,21,22]. While many often expect that the emergence of obesity-related complications will constitute a compounding reason for an obese patient to consider taking the decision or stepping up their desire to reduce weight, this is usually not the case in practice[13,23].

The Health care practitioners' ignorance or sidestepping of these complexities leads to inadequate management efforts; this is even more so in the South African public sector where clinicians have limited time per encounter due to long queues of patients[8]. Less emphasis is put on the collection of anthropometric data, which impacts their diagnostic capabilities[24,25]. Obesity is often not mentioned in the patient's problems list, meaning it is often overlooked in the management plan[21,26]. The difference in perception of weight and opinion on health implication between a patient and their health care provider leads to conflicting agendas and demonstrates the difficulty to implement evidence-based practice for successful management of obesity[23,27,28].

The National Health Department's 2015-2020 Strategic Plan for the Prevention and Control of Obesity highlights the need to understand the context and social determinants of obesity for the successful implementation of weight loss interventions[8]. Understanding the complicated relationship between weight perception, the socio-determinant factors of obesity and health status, will help the healthcare provider achieve this goal.

1.2. Aim

The purpose of this study is to help understand the determinant factors of obesity management by exploring obese patients' perception of weight, barriers to weight reduction and preferred weight-loss interventions.

1.3. Objectives

The objectives of this research are;

- To examine the demographics of obese patients attending Dr Yusuf Dadoo Hospital (DYDH);
- To evaluate obese patients' perception of weight in relation to their anthropometric measurements;
- To assess obese patients' level of awareness of health risk associated with obesity;
- To explore obese patients perceived barriers to weight reduction and preferred medical interventions.

2. METHODOLOGY

2.1 Study design:

This research will be a prospective, quantitative and cross-sectional study, using a structured Self-administered questionnaire (SAQ), a Body image assessment tool (BIAT) as well as the participant's biometrics including their medical condition, anthropometry and calculated BMI. Although a study about participant perception may be well run in a qualitative study, the current study will be done using a survey-type questionnaire rather than an in-depth interview. The questionnaire has been structured to allow for a deductive approach during data analysis.

2.2 Study site:

This research will be carried out at the outpatient department of DYDH; a 245 beds district hospital of West Rand District in Mogale City, Gauteng. The catchment area of the hospital comprises a low and middle-income population with mixed racial divide[29]. It is primarily located in the urban complex of Krugersdorp, serving nine other, mostly disadvantaged settlements and rural areas of Mogale city for a total population of 383 864[30].

2.3 Study population

The target population of this study is all obese patients attending the chronic section of DYDH's outpatient department (OPD). The WHO definition criteria for obesity is used, meaning a BMI ≥ 30 Kg/m2 or waist circumference ≥ 102cm for males or ≥ 88cm for females. The table below summarises the inclusion and exclusion criteria.

Table 1: Inclusion and Exclusion criteria

Inclusion criteria	**Exclusion criteria**
• Age > 18 • The patient attends the chronic section of Dr Yusuf Dadoo Hospital's OPD. • BMI ≥ 30 Kg/m^2 or waist circumference ≥ 102cm for males or ≥ 88cm for females.	• Pregnancy. • Ongoing psychiatric condition • Very ill patients.

2.4 Study Sampling

2.4. 1 Sample size

According to the World Health Organisation, 28.3% of the South African adult population was Obese in 2016. After consultation with a statistician, the calculated sample size is 213 based on the above-estimated population proportion. The sample was adjusted to a finite population of 680, corresponding to the average number of patients with chronic NCDs seen monthly at DYDH-OPD. The confidence interval was set at 95% with a margin error of 0.05.

2.4.2 Selection of participants

Due to academic timelines, convenience sampling will be used for the selection of participants. The researcher will work in collaboration with the nurses at the vital signs room. During the measurement of vital signs, any patient who records a BMI ≥ 30 kg/m^2 or a WC ≥ 102 cm for male and ≥ 88 cm^2 for female will be informed of the study and invited to participate. If the patient agrees, s/he will be directed to a separate room where a research assistant will initiate and obtain informed consent (see Appendix B). If the patient consent, s/he will be given the demographic data collection sheet, the Questionnaire and the Body image scale to complete (see Appendix C, D and F). After completion of the questionnaire and BIAT, the patient will then be taken to a consulting room where the researcher will record her/his biometric data (see Appendix E) and attend to her/his reason for the encounter. The illiterate patient will be assisted by the research assistant for the completion of the questionnaire.

2.5. Measuring tool or instrument:

2.5.1. Data collection

The collection of data will be done in four ways: using a demographic data collection sheet (see Appendix C), a standardised structured questionnaire related to weight (see Appendix D), a validated Body image assessment tool (BIAT) (see Appendix F), and a biometrics data collection sheet (see Appendix E).

The Demographic data collection sheet will include the date, a unique form number generated in the order of collection, the participant's preferred language, gender, age, level of education, marital status and occupation.

The Weight-Related Questionnaire is an adapted version of the Focused Group questions used by Thomas et al. in a qualitative study on weight perception[32]. With permission from the author (see Appendix H), modifications initially consisted of the omission of the first question's category, titled "Meaning of weight" find to be more relevant for a qualitative study. The remaining questions were structured to accommodate options for quantitative assessment without significant change to the wording. The questionnaire was piloted to test its feasibility and relevance in our setting; this led to a number of amendments and additions. Also as a result of the pilot study, the questionnaire was translated into Africans to accommodate a large number of Africans speaking participants. The researcher recognised that the focused group questionnaire is not a validated tool; however, it is well-tailored to answer our research questions. The amended, structured questionnaire comprises four categories, not mentioned on the form to avoid bias; namely, psychosocial perception on weight, weight and health relation, perceived barriers to weight reduction and expected health professional role.

The Body Image Assessment Tool (BIAT) to be used in this study is a validated tool developed as a culturally relevant instrument measuring levels of body image

dissatisfaction (BID) in both sexes[33] (See Appendix F). Several methods of BID evaluation have been developed and tested. The body image scale used in this study is a figural scale that comprises two sets of nine silhouettes ranging from thin to extra fat. Participants are asked to choose what they perceive to be their currents body image (first set) and what they perceive to be their ideal body image (Second set). The difference between these two rankings informs of an existing BID, usually related to a slim ideal[34,35]. The BIAT form will be handed to the participant after they have completed the questionnaire.

After the participant has completed the questionnaire and the BIAT form, s/he will be sent to the researcher, who will record any ongoing NCD the participant is suffering from as well as the anthropometric data, namely weight, height, waist circumference and calculated BMI. A Biometrics Data Collection Sheet (See Appendix D) will be used to collect this information.

A colour dot will be placed inside the front page of the patient's file to avoid re-invitation. Also, a Participants Tracking sheet (see Appendix G) will be used to track the number of patients who are invited and whether they consent or do not consent to participate in the study. The nurse will fill it in the vital room.

2.5.2. Data Analysis

After collection, data will be captured into Microsoft Excel, before being uploaded into Statistica Version 13.0 for descriptive and inferential statistical analysis. Prospective data generated by the study and the applicable statistical analysis were considered after discussion with a Statistician. This expertise will be considered during data analysis. The full set of intended statistical analysis is shown in the table below

Objectives	Analysis	Outcome
➢ To examine the demographics of obese patients attending Dr Yusuf Dadoo District Hospital (DYDH); ➢ Categorical variables: language, gender, education level, marital status and Occupation. ➢ Continuous variables like age	➢ Descriptive stats such as frequencies and percentages. ➢ Measures of central tendency ➢ Cross tabulation	➢ Prevalence of the Obesity population attending Dr Yusuf Dadoo Hospital ➢ Identification of patterns and profiling of the obese population
➢ To evaluate obese patients' perception of weight in relation to their anthropometric measurements;	➢ Descriptive stats such as frequencies and percentages.	➢ Identification of patterns and profiling of the obese population
➢ To assess obese patients' level of awareness of health risk associated with obesity;	➢ Chi-square test (To measure association) ➢ Logistic regression (Magnitude of association using p-value and Odd Ratio)	➢ Understanding of the complex relationship between weight perception, Psycho-social determinant of obesity and health status ➢ In this study, a P-value of <0.05 and 95% CI will be considered as statistical significance.
➢ To explore obese patients perceived barriers to weight reduction and preferred medical interventions.	➢ Descriptive stats such as frequencies and percentages.	➢ Identification of patterns and profiling of the obese population

2.6. Sources of bias:

The researcher foresees a selection bias due to convenience sampling of participants; this will be minimised by selecting only patients responding to our inclusion criteria. We

anticipate a potential lead bias from the research assistant as s/he gives clarification during the information and consent phase, or while s/he checks the completeness of the questionnaire and seek clarity from the participant. The research assistant will be trained to minimise these biases. The questionnaire was piloted and structured to allow for multiple options, including open options to minimise potential response bias. The BIS will be handed last to the participant.

2.7. Limitations:

The researcher expects some limitations due to the study design and the nature of the topic, which would be better assessed qualitatively rather than quantitatively. Furthermore, because we intend to assess the participant's attitude toward weight in a quantitative study, this would have been better a cohort than a cross-sectional study to measure the impact of change in attitude over time; this, however, is not possible due to academic timelines. The use of a structured questionnaire to assess the participant's perception will yield closed answers and potentially reduce the depth of collected information.

3. ETHICAL CONSIDERATIONS:

Before starting the research project, we will seek permission from the Hospital's management (see Appendix H). This proposal will then be submitted to the Wits Human Research Ethics Committee (HREC-Medical) as well as the provincial Research Council for approval. The researcher will ensure that the quality and integrity of the research are upheld by adhering to fundamental research ethics' principles. Informed consent will be obtained from all participants. All the data collection forms, including the Questionnaire, are self-administered and anonymous. Research team members will be requested to

respect the participant's autonomy and confidentiality at all time; to avoid any distress or potential harm to the participants and show independence and impartiality. The researcher will securely store raw data in a locked cupboard, and digitally with a password on a hard drive. Hard copies will be destroyed after a minimum of two years following publication. The results of this research will be disseminated through articles, conference and research days.

4. TIME FRAME:

This the table below represent the different phases of the research study from the literature review phase to the publishing.

	April 2019	May 2019	June 2019	July 2019	Aug 2019	Sept 2019	Oct 2019	Nov 2019	Dec 2019	Jan 2020	Feb 2020	Mar 2020
Literature review												
Preparing protocol												
Protocol assessment												
Ethics application												
Provincial Application												
Collecting data												
Data analysis												
Writing up - thesis												
Writing up - paper												
Publication												

	Mar 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021
Literature review												
Preparing protocol												
Protocol assessment												
Ethics application												
Provincial Application												
Collecting data												
Data analysis												
Writing up - thesis												
Writing up - paper												
Publication												

6. POTENTIAL CHALLENGES:

The researcher foresees potential challenges such as extended time for ethics and provincial approvals, budget constraint, as so far, we do not have a grant, and the researcher is the sole financier of the project. During data collection, we might be faced with a high rate of clients not consenting to participate, in which case we might be obliged to apply for time extension after a request is submitted to HREC. Also, the use of a questionnaire warrants some degree of education for the participant to be able to complete independently, which cannot be guaranteed for each eligible client. The research assistant will have to be trained for such difficulty and should be able to speak the local language. Unrecorded biometrics data might also constitute a challenge.

5. BUDGET: Research Grant Budget Form

Name: Buhendwa Kanozire **Student No: 2061768**			
TITLE: OBESE PATIENTS' PERCEPTION OF WEIGHT, BARRIERS TO WEIGHT REDUCTION AND PREFERRED MEDICAL INTERVENTIONS			
Supervisor: Deidre Pretorius		**Co-Supervisor: Moshe Magethi**	
A. PERSONAL COST	**ITEM NUMBER**	**COST PER UNIT**	**AMOUNT**
1. Researcher	1	none	-
2. Research Assistant	30 days	R500 per day (Based on a 180000 annual pay scale)	R15000
3. Statistician	1	Provided by Wits	-
4. Thank you gift for clinic staffs	2-4	R250	R1000
B. COPYRIGHT			
1. Questionnaire	1	none	-
2. BIAT Figures	1	none	-
C. MATERIALS			
1. BMI tape measurer	1	R120	R120
2. WC Tape measurer	1	Combined with BMI tape	-
3. Weight -scale	1	Provided by the Hospital (the district technicians provide calibration)	-
4. Height Measurer	1	Provided by the Hospital (the district technicians provide calibration)	-
D. EQUIPMENT			
1. Consulting room	1	Provided by the Hospital	-
2. Laptop	1	Owned by researcher	-
3. Demographic forms - Print	213	R0.50 per page	106.5
4. Questionnaire - Print	213x2	R0.50 per page	R213
5. BIAT forms - Print	213	R0.50 per page	R106.5

6. Biometrics forms - Print	213	R0.50 per page	R106.5
7. Informed consent	213x2	R0.50 per page	R213
8. Print research proposals	80 x 3	R0.50 per page	R120
9. Statistica software	1	R200	R200
10. Proof Reading of report	80	R50 per page	R4000
11. Print Research report	80x3	R0.50 per page	R120
E. TRAVEL			
1. Assistant	30	R50	R1500
F. UNPLANNED COSTS	1	R1000	R1000
TOTAL			**R 23 805,5**

7. REFERENCES

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8. APPENDICES

8.1 Appendix A: REQUEST FOR PERMISSION TO CONDUCT A RESEARCH STUDY

Dr Buhendwa Kanozire
Family Medicine Department
West Rand Health District
Wits University

To: CEO,
Dr Yusuf Dadoo Hospital
West Rand Health District
Krugersdorp
1740

Krugersdorp, 12 Oct 19

Ref: REQUEST FOR PERMISSION TO CONDUCT A RESEARCH STUDY AT DR YUSUF DADOO HOSPITAL

Dear Sir,

I am a Family Medicine Registrar from Wits University, based in the West Rand District and wish to conduct a research titled "Obese Patients' Perception of Weight, Barriers to Weight Reduction and Prefeered Medical Intervention at Dr Yusuf Dadoo Hospital" as a requirement for the partial fulfilment of my master's degree. This research project will be conducted under the supervision of Deidre Pretorius and Dr Moshe Magethi.

I am hereby seeking your permission to conduct the research project at Dr Yusuf Dadoo Hospital. I have attached a copy of my proposal, which includes the measures, consent and assets to be used in this research process.

Thank you for your time and consideration in this matter. I hope my request is duly granted.

Yours sincerely,

Dr B. Kanozire



8.2 Appendix B PATIENT INFORMATION SHEET AND CONSENT FORM

Good Day,

I am Dr Buhendwa Kanozire, a registrar in the Department of Family Medicine at the University of the Witwatersrand, assigned to the West Rand Health District. I am currently heading a team conducting a research study titled "*Obese patients' perception of weight, barriers to weight reduction and preferred medical interventions at Dr Yusuf Dadoo Hospital*".

Why are we doing this? At the end of this research, doctors and nurses will have a better understanding of the challenges that face patients who present with excessive weight and will be better prepared to manage them.

What do we expect from you? With your permission; you will be asked to anonymously complete a demographic form, a questionnaire and a form with images to choose from. Next, the doctor will check your file and collect your weight, height and waist circumference measured by the nurse, as well as any non-communicable disease you might be suffering from. Kindly ask if you do not understand a question.

Are there benefits or risk to the participants? There is a benefit to you because any spotted abnormality detected during this process will be attended to by the doctor. To the best of our knowledge, there is no physical risk to the participants, although we recognise that some patients might feel uncomfortable when discussing their weight-related challenges.

What about confidentiality? Confidentiality will be maintained at all time. All the forms and questionnaire used are anonymous and self-administered, meaning we will not record your name, nor your date of birth. The results will be anonymously published in a medical journal.

Should you have any queries, more information may be obtained from Dr. B. Kanozire on this number: 011-951-6000. Read and sign the consent form below if you are happy to participate in this study.

Thank you,

Dr B. Kanozire.

Consent form

I consent to take part in this research, as outlined in the information sheet above.

I understand that I am free to withdraw from the research at any time without penalty.

It has been explained to me that the purpose of the research is to help health care providers better understand the challenges that face patients presenting with excessive weight.

I understand that the confidentiality of my records will be maintained by the anonymous nature of data collection.

I have had the opportunity to ask questions

Patient's name.....Signature.....Date.....

Witness 1…… Witness 2……

20

3 Appendix C: DEMOGRAPHIC DATA

PLEASE COMPLETE THE FOLLOWING QUESTIONNAIRE ANONYMOUSLY

Please mark the applicable answer(s) with an "X." Indicate ONLY ONE answer.

Date		Form Number	

1	What is your first language	

2	Sex	Male	
		Female	

3	Age	

4	Please indicate how far you completed school or any other education	

5	Marital status	Single	
		Engaged	
		Living together	
		Married	
		Divorced	
		Widow(er)	

6	Occupation	

8.4 Appendix D: WEIGHT RELATED QUESTIONNAIRE

Please mark the applicable answer(s) with an "X." OR fill in the answer

N0	QUESTIONS	ANSWERS			
1	Compared to most of your friends, how do you find your weight?	Same	Bigger	Smaller	
2	Compared to most of your family members, how do you find your weight?	Same	Bigger	Smaller	
3	How do you feel about your weight	Happy	Not happy	Not bothered	
4	Have you ever felt that you should lose weight ?	No	Sometimes	Yes	
5	If yes , what would be the main reason?				
6	Have you ever been told **directly** by a family member or a friend that you need to lose weight?	No	Sometimes	Yes	
7	Have you ever been told **indirectly** by a family member or a friend that you need to lose weight?	No	Sometimes	Yes	
8	If Yes, how did you feel about?	Annoyed	Encouraged	Upset	Worried
		OTHER			
9	How would your family or friends react to your attempt to lose weight?	They will be happy	They will not care	They will not want me to lose weight	
10	Have you ever attempted to lose weight	No	Yes	Still trying	
11	If you tried, when was it?				
12	If you tried, how much weight did you lose?				
13	If you tried losing weight, what **did not work** for you				
14	If you tried losing weight, what **worked** for you				
15	If you tried to lose weight, what made you stop				

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16	If you never tried, **why**?			
17	Do you think there is a relationship between a person's weight and their health?	No	Possibly	Yes
18	If yes or possibly, name one or more health problems that you believe are caused or made worse by excessive weight?			
19	Do you think your weight is damaging your health?	No	Possibly	Yes
20	Do you think your health problem have played or play a role in you attempt to lose weight?	No	Possibly	Yes
21	Do you think you would be able to lose weight if you tried or tried again?	No	Possibly	Yes
22	What would you do to lose weight?			

23	What do you think is the biggest obstacle to you losing weight or adopting a lifestyle that helps control your weight? **-You can select any number of options you identify with.** **- If the options do not reflect your opinion, feel free to list your opinion under "Other"**	I don't know how to lose weight	
		I do not feel motivated	
		I don't have money	
		I don't have support	
		I don't have time	
		Happy with my weight	
		It will not change my health	
		I like eating nice food	
		My partner doesn't want me to lose weight	
		People will think I am sick	
		I am too sick to exercise	
		You just again pick up the weight you lost after time	
		Other :	

24	Have you ever been told by a **doctor** that you need to lose weight?	Never	Many times	Once or Twice
25	Have you ever been told by a **nurse** that you need to lose weight?	Never	Many times	Once or Twice
26	Do you feel comfortable talking about your weight problems with a **doctor**?	Yes, comfortable	No, uncomfortable	Unbothered /neutral
27	Do you feel comfortable talking about your weight problems with a **nurse**?	Yes, comfortable	No, uncomfortable	Unbothered /neutral
28	If Yes in the previous 2 questions, do you think you were given enough information or support to help you lose weight?	Enough	Not enough	None
29	Did any of the doctor or nurse follow up on your weight after s/he discussed it with you?	Never	Regularly	Sometimes
30	How would you have liked the doctor or the nurse to help you with your attempt to lose weight? **- Tick the answers that you can identify with the most.** **- Please specify if you chose "Other"**	They cannot help me		
		Discuss a weight loss program / plan		
		Check on me regularly		
		Give me a pill		
		Send me for surgery		
		Tell me how and what to eat and drink		
		Build a relationship of trust with me		
		Tell me how to exercise		
		Other:		

8.4 Appendix D : **GEWIG - EN GESONDHEIDSVRAELYS (AFRIKAANS)**

Merk die toepaslike antwoord of skryf jou eie antwoord in spasie

N0	VRAE	ANTWOORDE			
1	As jy jou gewig vergelyk met die gewig van jou **vriende**, hoe vergelyk jy?	Dieselfde	Groter	Kleiner	
2	As jy jou gewig vergelyk met die gewig van jou **familie**, hoe vergelyk jy?	Dieselfde	Groter	Kleiner	
3	Hoe voel jy oor jou gewig?	Gelukkig	Ongelukkig	Gee nie om nie	
4	Het jy ooit oorweeg om gewig te verloor?	Nee	Soms	Ja	
5	As jy JA antwoord, wat was jou belangrikste rede?				
6	Het 'n familielid of vriend al ooit **direk** vir jou gesê jy moet gewig verloor?	Nee	Soms	Ja	
7	Het 'n familielid of vriend al ooit **indirek** vir jou gesê jy moet gewig verloor?	Nee	Soms	Ja	
8	As JA op enige van die twee bogenoemde vrae, hoe het jy gevoel?	Geirriteerd	Gemotiveerd	Vies	Bekommerd
		ANDER			
9	Hoe sal jou vriende en familie reageer as jy probeer gewig verloor?	Hulle sal bly wees	Hulle sal nie omgee nie	Hulle sal nie wil hê ek moet gewig verloor nie	
10	Het jy al voorheen prober gewig verloor?	Nee	Ja	Probeer steeds	
11	As jy probeer het, wanneer was dit?				
12	As jy probeer het, hoeveel gewig het jy verloor?				
13	As jy probeer gewig verloor het, wat het **nie vir jou gewerk nie**?				
14	As jy probeer gewig verloor het, wat **het gewerk**?				

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15	As jy gewig probeer verloor het, hoekom het jy opgehou?			
16	As jy nooit probeer het nie, hoekom?			
17	Dink jy daar is 'n verband tussen 'n person se gewig en gesondheid?	Nee	Miskien	Ja
18	As ja of miskien, noem een of meer gesondheidsprobleme wat jy glo veroorsaak of vererger word a.g.v. oorgewig?			
19	Dink jy daar is 'n verband tussen jou gewig en jou huidige gesondheidsprobleme?			
20	Dink jy jou gesondheidsprobleem het 'n rol gespeel in jou poging om gewig te verloor?	Nee	Miskien	Ja
21	Dink jy jy kan gewig verloor as jy weer probeer??	Nee	Miskien	Ja
22	Wat sal jy doen om gewig te verloor?			

23	Wat is jou grootste struikelblok om gewig te verloor of gesonder leefstyl te hê wat jou gewig beter beheer? **-Jy kan meer as een opsie kies as dit op jou van toepassing is. As die bestaande opsies nie jou opinie verteenwoordig nie, skryf jou opsie onder "Ander".**	Ek weet nie hoe om gewig te verloor nie	
		Ek voel nie gemotiveerd nie	
		Ek het nie geld nie	
		Ek het nie ondersteuning nie	
		Ek het nie tyd nie	
		Ek is gelukkig met my gewig	
		Gewigsverlies sal my nie help nie	
		Ek hou van lekker eet	
		My geliefde sal nie daarvan hou as ek gewig verloor nie	
		Mense sal dink ek is siek	
		Ek is te siek om te oefen	
		Mens tel net die gewig wat jy verloor het, weer op	

		Ander :

24	Het 'n **dokter** al ooit vir jou gesê om gewig te verloor?	Nooit	Baie keer	Een of twee keer
25	Het 'n **verpleegste**r al ooit vir jou gesê om gewig te verloor?	Nooit	Baie keer	Een of twee keer
26	Voel jy gemaklik om met 'n **dokter** jou gewig te bespreek?	Ja, gemaklik	Nee, ongemaklik	Neutraal
27	Voel jy gemaklik om met 'n **verpleegster** jou gewig te bespreek?	Ja, gemaklik	Nee, ongemaklik	Neutraal
28	As jy Ja vir een van die vorige 2 vrae geantwoord het, voel jy jy het genoeg inligting gekry om jou te help gewig verloor?	Genoeg	Glad nie genoeg	Niks
29	Het enige dokter of verpleegster ooit opgevolg op jou gewig nadat hy/sy met jou daaroor gepraat het?	Nooit	Gereeld	Somtyds
30	Hoe wil jy hê die dokter of verpleegster moet jou help met gewigsverlies? **-Jy kan meer as een opsie kies as dit op jou van toepassing is. As die bestaande opsies nie jou opinie verteenwoordig nie, skryf jou opsie onder "Ander".**	Hulle kan my nie help nie		
		Bespreek 'n gewigsverlies program / plan		
		Volg my gereeld op		
		Gee my 'n pil		
		Stuur my vir 'n operasie		
		Vertel my wat en hoe om te eet		
		Bou 'n vertrouensverhouding met my		
		Vertel my hoe om te oefen		
		Ander:		

8.5 Appendix E: BIOMETRIC DATA COLLECTION SHEET

TO BE COMPLETED BY THE RESEARCHER OR RESEARCH ASSISTANT

Patient's condition(s)		Date Discovered (Months / Years)
1.1	Diabetes	
1.2	High Blood Pressure	
1.3	Other Cardiovascular Disease	
1.4	Dyslipidaemia	
1.5	Osteoarthritis	
1.6	Asthma	
1.7	Cancer	
1.8	Others (Specify)	

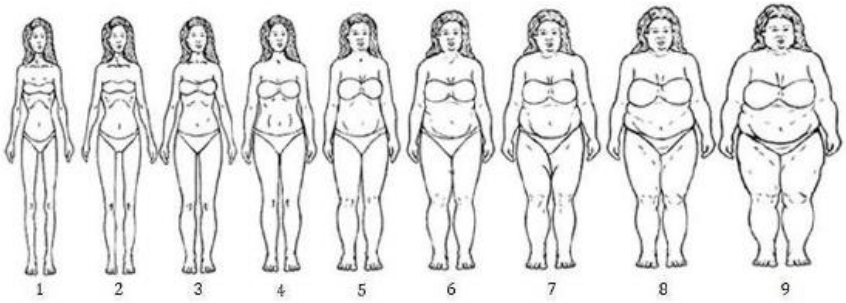
2. Patient's anthropometric records and BMI

2.1	Weight	
2.2	Height	
2.3	Waist Circumference	
2.4	Calculated BMI	

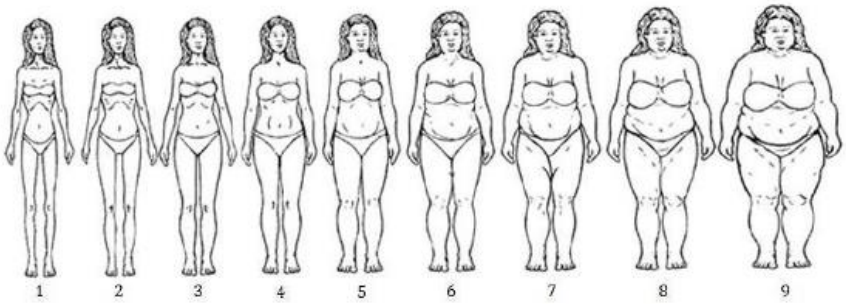
28

8.6 Appendix F: BODY IMAGE ASSESSMENT TOOL (FEMALE)

Figure 1: BODY IMAGE ASSESSMENT TOOL (Female)



Circle the number of the figure that most closely represent how you look **now**

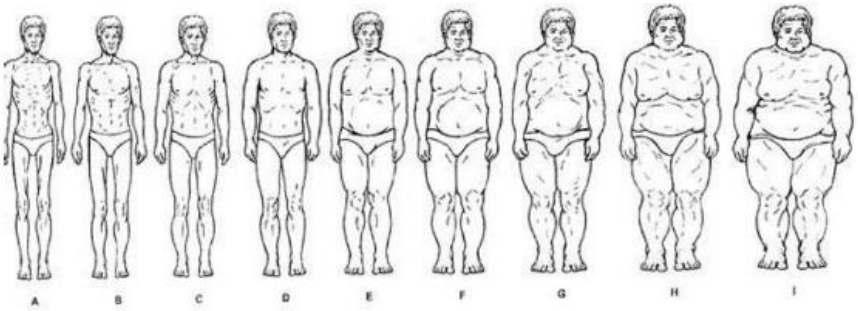


Circle the number of the figure that most closely represent how you **would like** to look

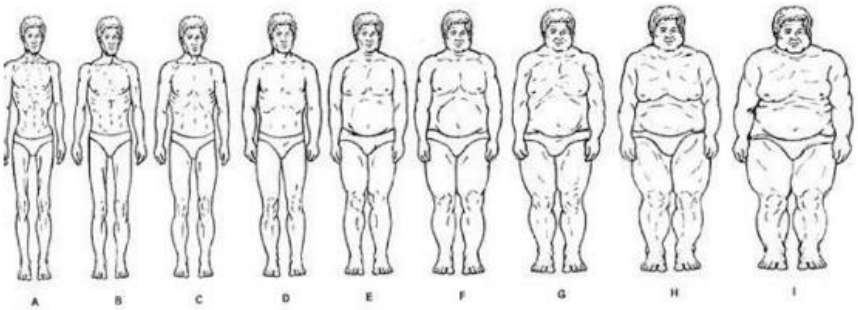
Reference:
Pulvers KM et al. Development of a culturally relevant body image instrument among urban African Americans. Obesity Research. 2004;12(10):1641–51.

8.6 Appendix F: BODY IMAGE ASSESSMENT TOOL (MALE)

Figure 2: BODY IMAGE ASSESSMENT TOOL (Male)



Circle the number of the figure that most closely represent how you look **now**



Circle the number of the figure that most closely represent how you **would like** to look

Reference:
Pulvers KM et al. Development of a culturally relevant body image instrument among urban African Americans. Obesity Research. 2004;12(10):1641–51.

8.7 Appendix G: **RESEARCH PARTICIPANTS - TRACKING SHEET**

Study Title: OBESE PATIENTS' PERCEPTION OF WEIGHT, BARRIERS TO WEIGHT REDUCTION AND PREFERRED MEDICAL INTERVENTIONS AT DR YUSUF DADOO HOSPITAL					
No	**File Number**	**Date**	**Invited**	**Consent given**	**Consent rejected**
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
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14					
15					
16					
17					
18					
19					
20					

8.8 Appendix H: **Permission for use of Focused group questions (Page 1)**

Gmail — Olivier Buhendwa <olivierbuhendwa@gmail.com>

Request for permission to use part of research methodology
10 messages

Olivier Buhendwa <olivierbuhendwa@gmail.com> Sat, Apr 20, 2019 at 10:06 AM
To: athomas@augusta.edu

Dear Dr. Andria,

Thank you for allowing me to get in contact with you, as relayed by Dr. Sallie.

I am a family medicine resident at the University of Witwatersrand in South Africa and I am required to run and submit a research study as part of the MMed program.

I am interested in studying obese patients' perception of weight and perceived barriers to weight reduction in a multiracial setting. I find your work published in the Journal of Cultural Diversity Vol. 15, No. 4. Winter 2008 edition, titled "*Perceptions of obesity: Black and White differences*" very similar to many aspects of my project and would like to have your permission to include some elements of the methodology used into your work.

The material intended to be used in our project are the following; Table 1, Focus Group Questions, Journal of Cultural Diversity Vol. 15, No. 4, Page 177; Table 3, Focus Group Themes, Journal of Cultural Diversity Vol. 15, No. 4, Page 178.

The Focus Group Questions will be used with possible minor modifications as part of individual in-depth interviews of the participants. The Focus Group Themes will be used as part of the themes explored in the interview and during our analytic phase. These materials will be referenced as from your work.

Should you require additional information my email is olivierbuhendwa@gmail.com and Cellphone: +27762088210. Kindly let me know of a suitable time to call you, should you wish to have a direct discussion.

I would greatly appreciate your consent to my request.

Sincerely,

Buhendwa Kanozire, Olivier

MMed student, Family Medicine Department
University of Witwatersrand,
29 Princess of Wales Terrace, Parktown
Johannesburg, 2193
South Africa

8.8 Appendix H: PERMISSION FOR THE USE OF FOCUSED GROUP QUESTIONS (PAGE 2)



Olivier Buhendwa <olivierbuhendwa@gmail.com

Request for permission to use part of research methodology

Thomas, Andria <ATHOMAS@augusta.edu> Mon, Ap
To: Olivier Buhendwa <olivierbuhendwa@gmail.com>

Good afternoon,

I am happy to hear that the study we did will be of help to you. I am fine with y
with proper reference, in your work.

Have a good day and best of luck with your research.

-AT

Andria Thomas, PhD

Associate Dean for Evaluation, Accredit

Professor of Medicine

Medical College of Georgia

Augusta University

Augusta, GA

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8.9 Appendix I: PERMISSION FOR THE USE OF BODY IMAGE ASSESSMENT TOOL

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Jul 06, 2019

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Licensed Content Author	Kim M. Pulvers, Rebecca E. Lee, Harsohena Kaur, et al
Licensed Content Date	Sep 6, 2012
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Requestor type	University/Academic
Format	Print and electronic
Portion	Figure/table
Number of figures/tables	1
Original Wiley figure/table number(s)	Figure 1
Will you be translating?	No
Title of your thesis / dissertation	OBESE PATIENTS' PERCEPTION OF WEIGHT AND BARRIERS TO WEIGHT REDUTION IN THE CONTEXT OF CORMOBIDITIES
Expected completion date	Dec 2020
Expected size (number of pages)	60
Requestor Location	Buhendwa B Kanozire 1036 Krugerrand Road Strubens valley Johannesburg, Gauteng 1724 South Africa Attn:
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Total	0.00 USD
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Appendix VIII: Proofreading certificate

Bruce Conradie
66 Greenfield Rd
Greenside, Johannesburg
South Africa
Tel: +27 (0) 782-1401
info@theresearchfaculty.com

Attention: Buhendwa Kanozire
University of the Witwatersrand

18 Jul 2022

To whom it may concern

Confirmation of document editing

This letter is to confirm that I have edited the document titled:

> OBESE PATIENTS REPORTED DISSATISFACTION WITH WEIGHT, BODY IMAGE AND INTERACTION WITH CLINICIANS AT DR YUSUF DADOO DISTRICT HOSPITAL

The document was the work of Buhendwa Kanozire.

I may have involved the contributions of one or more subcontractor.

We have edited the document for errors of grammar, punctuation, and style. I have also provided the author with a list of aspects needing further attention or correction.

Excluded from the editing work were, if applicable, the annexures, mathematical or statistical formulae, the spelling of authors' names and other proper nouns, fact checking, foreign-language text, the content of Microsoft Word field codes, the accuracy of cross references or hyperlinks, the order of works within citations, acronym use, joining or splitting paragraphs, citation verbs' tense and number, and the use of first-person pronouns.

The service excluded checking that the reference list (if applicable) conforms to a specified style guide.

I am a registered member of the SA Institute of Translators.

Yours faithfully



Bruce Conradie
Research Support Specialist
The Research Faculty

Job reference number = JR00175

Appendix VIX: Turnitin Report

Kanozire - FINAL.docx

by Buhendwa Kanozire

Submission date: 16-Aug-2022 09:36PM (UTC+0200)
Submission ID: 1883292024
File name: Kanozire_-_FINAL.docx (145.38K)
Word count: 5134
Character count: 29047

OBESE PATIENTS REPORTED DISSATISFACTION WITH WEIGHT, BODY IMAGE AND INTERACTION WITH CLINICIANS AT DR YUSUF DADOO DISTRICT HOSPITAL

Buhendwa Kanozire
Student Number: 2061768

ADDITIONAL INFORMATION

This study's broader aim was to explore the determinant factors of obesity management by exploring obese patient' perception of weight, barriers to weight reduction and preferred weight-loss interventions.

The objectives were:

1. To examine the demographics of obese patients attending Dr Yusuf Dadoo Hospital
2. To evaluate obese patients' dissatisfaction with weight and body image in relation to their anthropometric measurements.
3. To assess obese patients' level of awareness of health risks associated with obesity.
4. To explore obese patients perceived barriers to weight reduction and preferred medical interventions.

The data collected during this study were too much for one article, and the author and supervisor decided to break it down into three different themes, namely:

1. Obese patients reported dissatisfaction with weight, body image and interaction with clinicians at Dr Yusuf Dadoo District Hospital.
2. Obese patients' health awareness and reported barriers to weight reduction at Dr Yusuf Dadoo District Hospital.
3. Obese patients preferred medical intervention at Dr Yusuf Dadoo District Hospital.

To meet the requirements for the MMed (Family Medicine report), a subset of a larger data set was identified from the study, namely "obese patients' dissatisfaction with weight and body image, barriers to weight reduction and preferred medical intervention at Dr Yusuf Dadoo Hospital, West Rand District" for the examination and first article.

As the article will only represent the methods applicable to the article's content, the author wishes to supplement this information for examining purposes.

The data collection tool had four sections. The first section comprised anonymised respondent identification details and demographics. The second contained a semi-structured questionnaire related to the patient's perception and attitude to weight, perceived barriers to weight reduction, preferred medical interventions and interaction

with healthcare providers. This questionnaire was an adapted version of a questionnaire used by Thomas and colleagues in a study on weight perception.[1] Although the questionnaire was used as part of a qualitative study, it was well-tailored to answer our primary research questions after adaptation. The questionnaire was piloted to test its feasibility and relevance in our study setting, and some amendments and additions were made. Also, as a result of the pilot study, the questionnaire was translated into Afrikaans to accommodate a large number of Afrikaans speaking participants.

The third section of the data collection tool contained a body image assessment tool, a validated tool developed as a culturally relevant instrument for measuring body image dissatisfaction in males and females. It is a figural scale that comprises two sets of nine silhouettes numbered from one to nine. One represents a perceived thin body image, and nine is an extremely fat one. Participants are invited to first circle the number of the silhouette they perceive to be their current body image (first set) and later the number corresponding to the silhouette of what they perceive to be their ideal body image (second set). The difference between these rankings informs an existing dissatisfaction with body image, usually related to a slim ideal.

The last section comprised a recording sheet for biometric data, namely, anthropometric measurements (weight, height and waist circumference) and calculated BMI and any ongoing non-communicable disease the patient suffered during the study. The WHO recommended BMI cut-offs and protocol for waist circumference measurement (the midpoint between the lower border of the rib cage and the superior iliac crest) were used to assess the patient's anthropometry and define obesity.

ABSTRACT

Background: Obesity in South Africa has created a public health crisis that warrants a multilevel intervention. Patients' perceptions and clinicians' challenges hinder the management of obesity in primary care.

Aim: The study aimed to assess obese patients' dissatisfaction with weight and body image and their perspectives of interaction with clinicians in a primary care setting.

Setting: Dr Yusuf Dadoo District Hospital, outpatient department.

Method: Cross-sectional study of 213 adults obese patients. A semi-structured questionnaire, a body image assessment tool and patient medical records were used for data collection.

Results: The study found that, contrary to popular belief, obese patients were dissatisfied with their weight (78.9%) and body image (95.3%). Many felt comfortable discussing weight reduction with clinicians, although 37.1% reported never engaging with a doctor, and 62.9% never interacted with a nurse on the subject. Only six percent reported receiving adequate information on weight reduction measures, and 19.7% were followed-up. Clinicians' advice was mainly associated with patients' high BMI and waist circumference. Doctors were less likely to recommend weight reduction to employed obese women, while nurses were more likely to engage Zulu-speaking patients. Patients were more likely to be followed up if there were young and excessively obese.

Conclusion: The study found that most obese patients were dissatisfied with their weight and body image and perceived their interaction with clinicians inadequate.

Contribution: The study highlights a possible shift in obese patients' weight and body image perception compared to previous reports. It also brings to light clinicians' deficiencies that warrant further education on obesity management.

INTRODUCTION

Background and Literature review

Obesity is an important contributing risk factor to many non-communicable diseases (NCDs), an induction factor for multimorbidity and a challenge for patients and clinicians in primary care practice.[2,3] In 2019, overweight and obesity cost the South African economy about 4.16% of the GDP or R219.15 billion.[4] Prevention and control of overweight and obesity are essential in reducing the burden of non-communicable diseases on strained healthcare systems, especially in countries with limited resources.[3,5]

The SANHANES-1 report had previously brought to light the crisis level of NCDs and obesity in South Africa[6], and according to the 2016 South African statistics on health survey, about two-thirds of women and one-third of men in the country were overweight or obese.[7] At this level of prevalence, obesity in South Africa has undoubtedly become epidemic with no downtrend in sight if serious measures are not taken to tackle this significant public health crisis.[3,8,9] As is the case in all epidemics, experts have advocated a multilevel approach to preventing and controlling obesity. This approach involves key players, such as government policymakers, clinicians and patients and their communities, who need to play their role decisively.[10,11]

Effective government policy implementation is necessary. However, as it has been the case in many other countries, the South African government has recognised the negative impact of obesity on public health and its strain on the health system. Nonetheless, it is still struggling to find the best suitable strategy for preventing and controlling overweight and obesity.[10,12,13]

The role of primary care providers in preventing and controlling overweight and obesity cannot be over-emphasised as they are at the forefront and constitute a key determinant factor in the fight against obesity.[14–17] However, studies have shown that many clinicians experience difficulty integrating weight management in their routine practice.[18–20] Some cannot identify obesity, while others poorly document obesity as a patient's problem that they need to address.[21,22] Some clinicians are biased and demonstrate a negative attitude regarding obese patients' ability or willingness to self-discipline or effectively engage with prescribed measures.[23] In contrast, others express ambiguity concerning the effectiveness of existing obesity management models.[24]

These clinicians' deficiencies significantly hinder their ability to fulfil their role and limit their contribution to the fight against overweight and obesity. However, obese patients and their communities contribute to the challenges faced by clinicians in managing obesity at the primary care level. Their roles in implementing measures to prevent and control obesity are decisive and determine whether a weight loss management plan is optimised and successful.[21] This is even more relevant to the South African context, as studies have demonstrated the impact culture has on individuals and communities' perception of weight in the country.[25,26] It has been shown that many obese patients see themselves as normal, content with excessive weight and show no interest in weight reduction measures.[27,28] This phenomenon is prevalent in patients whose cultural environment has normalised obesity. One highlight of such an environment is the emergence of the body positivity movement worldwide, which critics regard it as a counterproductive factor in the fight against obesity.[29] Other obese patients demonstrate poor insight into the health risk associated with obesity and show little appetite to embark on weight reduction measures despite being advised to do so.[27,29] However, recent studies have reported a gradual shift in obese patients' perception of health risks associated with obesity. More patients recognise the need for weight reduction measures. Still, the lack of motivation,the limited knowledge on weight loss strategies, and the limited access to resources and professional assistance continue to hinder their efforts.[27,30,31]

Obese patients' dissatisfaction with their weight and body image remains one of the determinant factors in their decision to participate in weight control measures.[31,32] Although a small proportion of obese patients will attempt to lose weight, studies have shown that few will manage to maintain an ideal weight if professional support is not provided.[33–35] The challenges faced by obese patients in controlling their weight have been partly attributed to a lack of constructive interaction with clinicians.[15,16,20,36]

Aim and objectives

In South Africa, for the previous 15 years, few studies have explored obese patients' views on their interaction with clinicians in primary care settings, and none was found to have been done in the West Rand. This study aimed to assess obese patients' dissatisfaction with weight and body image and their perspectives on interactions with

clinicians in a primary care setting. Its first objective was to determine obese patients' dissatisfaction with their weight and body image and how comfortable they were discussing weight management with clinicians. The second objective was to evaluate obese patients' views on their interaction with clinicians regarding weight reduction advice and follow-up.

METHODOLOGY

Study design

This was a cross-sectional study.

Study setting

The study was conducted in the outpatient department at Dr Yusuf Dadoo Hospital, located in Mogale City, west of Gauteng. Several regional primary healthcare centres feed the hospital, and its catchment area comprises a low and middle-income population of about 649 751 and a mixed cultural divide.

Study population

The study population included obese patients aged 18 years and above attending Dr Yusuf Dadoo District Hospital outpatient department. Patients were excluded if they were very ill, pregnant or had an ongoing unstable psychiatric condition. The WHO's definition criteria of obesity (Body Mass Index (BMI) of more than 30 kg/m^2 or a waist circumference (WC) of 102 cm or more for men and 88 cm^2 or more for women)[37] was used.

Sampling strategy

In 2016 the WHO reported that 28.3% of the adult population in South Africa was obese.[38] The calculated sample size was 213 based on the above–estimated population proportion with a confidence interval of 95% and a margin error of 0.05. The sample was adjusted to a finite population of 680, corresponding to the average number of patients with chronic NCDs seen monthly at Dr Yusuf Dadoo District Hospital outpatient department.

Selection of participants

Purposive sampling of consecutive patients was used for the selection of participants. The principal investigator collaborated with the nursing staff at the outpatient department. While collecting vital signs, the nurse invited patients to participate in the study if they fulfilled the inclusion criteria. Those who agreed were directed to a separate room where a research assistant obtained informed consent and gave them the study questionnaire. The research assistant assisted patients who had difficulty reading or writing in completing the questionnaire. After completing the questionnaire, the patient was directed to the consulting room, where the principal investigator attended to their reason for the encounter and recorded the biometric data.

Data collection tool

The data collection tool had four sections – the first comprised anonymised respondents' demographic details. The second contained a semi-structured questionnaire related to the patient's dissatisfaction with weight, how comfortable they were, discussing weight reduction measures with a clinician, and their perspectives of interaction with clinicians regarding weight reduction advice and subsequent follow-ups. This questionnaire was a modified version of a questionnaire used by Thomas and collegues.[1] Although it was used as a qualitative study instrument, it was well-tailored to answer our primary research questions after adaptation. The questionnaire was piloted to test its feasibility and relevance in our study setting, leading to some amendments and additions. Also, as a result of the pilot study, the questionnaire was translated into Afrikaans to accommodate many Afrikaans-speaking participants. The third section of the data collection tool contained a body image assessment tool, a validated tool developed as a culturally relevant instrument for measuring body image dissatisfaction in males and females. It is a figural scale that comprises two sets of nine silhouettes numbered from one to nine. One represents a perceived thin body image, and nine is an extremely fat body. Participants were invited to first circle the number of the silhouette they perceive to be their current body image (first set) and later the number corresponding to the silhouette of what they perceive to be their ideal body image (second set). The difference between these rankings indicates an existing body image dissatisfaction, usually related to a slim ideal[39]. The last section comprised a recording sheet for biometric data, namely, anthropometric measurements (weight, height and WC) and calculated BMI and any ongoing non-communicable disease the patient suffered during

the study. The WHO recommended BMI cut-offs and protocol for WC measurement (Midpoint between the lower edge of the rib cage and the crest of the ilium) were used to assess the patient's anthropometry and define obesity[40].

Data processing and analysis

Collected data were computed in Microsoft Excel. Each categorical variable was coded based on a pre-defined code sheet arranged by the principal investigator to minimise errors before uploading it into Stata Statistical Software version 16.1, 2019 release for analysis. Continuous variables were reported as median and ranges, and categorical variables as frequency and percentage. The International Atherosclerosis Society (IAS) and International Chair on Cardiometabolic Risk (ICCR) 's consensus statement on waist circumference were used to categorise WC by cardiovascular(CVD) risk.[41] To measure body image dissatisfaction, the authors calculated the absolute difference between the numbers corresponding to the current perceived body image and the ideal body image on the body assessment tool. Any result above one indicated dissatisfaction, and any below suggested no dissatisfaction. Obese patients' perspectives on their interaction with clinicians were assessed using reports of advice on weight reduction and follow-up after the initial discussion. Chi-squared tests were performed to determine any association between patients' characteristics and their interaction with clinicians. A two-step logistic regression was performed, and its results are reported as odds ratios (OR), confidence intervals (95% CI) and *p*-values (*p*). Univariate logistic regression models were conducted to assess whether patients' characteristics influenced clinicians' advice on weight reduction and subsequent follow-up. Multivariate logistic regression models were perfomed to control confounders by adjusting statistically and clinically significant factors. A p-value <.05 was deemed statistically significant.

Ethical Considerations

The study proposal was submitted to the Wits Human Research Ethics Committee for ethics clearance and was approved under the protocol reference number M200118. Permission was also obtained from the Gauteng province and Dr Yusuf Dadoo hospital management. All study participants provided written consent and were informed of their participation's voluntary nature and their right of withdrawal at any time with no impact

on the service they ought to receive. The data collection sheet and questionnaire were anonymised.

RESULTS

During data collection, 230 patients were eligible for participation in the study. Five severely ill and two pregnant patients were excluded. Altogether 223 patients were invited, but ten declined, leaving 213 participants. No reason for the refusal was asked as it was the patient's right to refuse.

Socio-demographic characteristics of patients

Obese patients' baseline characteristics (Table 1) show that the median age was 53 years, ranging from 23 to 75 years. Most obese patients attending the hospital's outpatient department during the study were aged 46 to 55 years (67; 31.5%) and 56 to 65 years (63; 29.6%). There were more women (153; 71.8%) than men (60; 28.2%). Most were Tswana speaking (69; 32.4%), followed by Afrikaans (59; 27.7%). Eighty-seven patients were married (40.8%), and 147 (69%) had completed secondary school. One hundred and twenty-five were employed (58.7%). There were 168 (78.9%) severely obese patients with BMIs of 35kg/m^2 or above, and 85 (39.9%) were extremely obese (BMI ≥40kg/m^2). CVD risk stratification related to waist circumferences showed that 169 (79.34%) patients had extremely high CVD risk. Eighty-seven patients (40.8%) had a metabolic disease, and 73 (34.27%) were multimorbid.

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Table 1: Sociodemographic characteristics of patients (n=213)

Baseline characteristics	Level	Frequency	Percentage
Age (years) Median: 35(23-75)	18-25	1	0.5
	26-35	19	8.9
	36-45	36	16.9
	46-55	67	31.5
	56-65	63	29.6
	> 65	27	12.7

Gender	Women	153	71.8
	Men	60	28.2
Language	Tswana	69	32.4
	Afrikaans	59	27.7
	Zulu	25	11.7
	Sotho	14	6.6
	Xhosa	18	8.5
	Sepedi	6	2.8
	Ndebele	5	2.4
	English	10	4.7
	Venda	7	3.3
Marital status	Single	33	15.5
	Married	87	40.9
	Divorced	31	14.6
	Living together	29	13.6
	In relationship	10	4.7
	Widowed	23	10.8
Education	No formal education	8	3.8
	Primary school	28	13.2
	Secondary school	147	69
	Tertiary education	30	14.1
Employment status	Employed	125	58.7
	Unemployed	54	25.5

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	Pensioner/Retired	34	16
BMI (kg/m^2) Median: 38.5(31.5-63.7)	Class 1 (30-30.9)	45	21.1
	Class 2 (35-39.9)	83	39
	Class 3 (≥ 40)	85	40
WC (cm) Median: 126(107-173)	Very high CVD risk (Female≥105; Male ≥110)	44	20.7
	Extremely High CVD risk (Female≥115; Male ≥125)	169	79.3
Comorbidities	Metabolic disease	87	40.9
	Multimorbidity	73	34.3
	Cardiovascular	36	16.9
	Respiratory diseases	8	3.8
	Musculoskeletal disease	3	1.4
	Cancer	2	0.9
	Other	4	1.9

Most obese patients reported a great level of dissatisfaction with their weight and body image (Table 2). Of these, 168 (78.9%) expressed unhappiness with their current weight, 199 (93.4%) had thought of losing weight, 156 (73.2%) reported previous weight loss attempts, and 203 (95.3%) expressed dissatisfaction with their current body image.

Table 2: Obese patients' level of dissatisfaction with weight and body image (n=213)

Variables	Responses	Frequency	Percentage	OR (95%CI)	*p*-Value
Current feeling about weight	Happy	45	21.1	0.07(0.04–0.11)	< .001
	Not happy	168	78.9	13.94 (8.75–22.19)	
Ever thought of losing weight	No	14	6.6	0.004 (0.00–0.01)	< .001
	Yes	199	93.4	202 (93.88–434.81)	
Ever attempted to lose weight	No	57	26.8	0.13 (0.09–0.21)	< .001
	Yes	156	73.2	7.49 (4.88–11.5)	
Dissatisfied with body image	No	10	4.7	0 (0.00–0.10)	< .001
	Yes	203	95.3	412 (167–1011.4)	

Table 3 documents obese patients' reported comfort when discussing weight management and interaction with clinicians. Altogether, 197 (92.5%) patients were comfortable discussing weight management with a doctor, and 210 (98.6%) were happy discussing it with a nurse. Seventy-nine (37.1%) patients reported never being engaged by a doctor, and 134 (62.9%) never engaged with a nurse. Hundred-and-eleven (52.1%) obese patients who were either engaged by a doctor or a nurse reported not receiving information on how to lose weight, and 89 (41.8%) thought they were not given enough information. Hundred-seventy-one (80.3%) patients said no clinician followed up with them after an initial weight loss discussion.

Table 3: Obese patients' reported comfort in discussing weight management and interaction with clinicians (n=213)

Variables	Responses	Frequency	Percentage	OR(95%CI)	*p*-Value
Comfortable discussing weight management with a doctor	No	16	7.5	0.0 (0.0–0.01)	
	Yes	197	92.5	151.6(73.7–311.6)	< .001
Comfortable discussing weight management with a nurse	No	3	1.4	0.0 (0.0–0.001)	
	Yes	210	98.6	4900 (977–24556)	< .001
Have been told by a doctor to lose weight	Never	79	37.1	0.35 (0.23–0.51)	
	Yes	134	62.9	2.88 (1.94–4.26)	< .001
Have been told by a nurse to lose weight	Never	134	62.9	2.88 (1.94–4.26)	
	Yes	79	37.1	0.35 (0.23–0.51)	< .001
Information received on how to lose weight	None	111	52.1	72.9 (32.35–164.3)	< .001
	Not enough	89	41.8	46.9 (20.6–106.7)	<.001
	Enough	13	6.1	0.01 (0.00–0.03)	< .001
Followed-up after weight loss discussion	Never	171	80.3	4 (2.67–5.98)	
	Yes	42	19.7	0.25 (0.17–0.37)	< .001

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Association between obese patients' characteristics and interactions with clinicians

Chi-squared test results showed that doctors' provision of advice on weight loss was significantly associated with patients' BMI ($p < .001$) and WC ($p < .001$). In contrast, nurses' advice was associated with patients' language ($p = .007$), BMI ($p = .004$) and WC size ($p = 0.01$). A significant association was also found between the amount of information received for weight reduction and patients' age ($p = .013$), BMI ($p < .001$) and WC ($p < .001$). There was no association between obese patients' medical conditions and the information received. Follow-up of patients after the initial provision of advice on weight reduction was significantly related to the patient's age ($p = .006$), BMI ($p = .001$) and WC size ($p = .004$).

Factors influencing clinicians' provision of advice on weight reduction

Results of logistic regressions suggested that patients were more likely to be advised by doctors to lose weight if they were morbidly obese (Class 3 BMI) (OR=4.5; 95% CI: 2.03–10.02; $p = .001$) and had a severely large WC, (OR=3.6; 95% CI: 1.79–7.12; $p < .001$). After adjusting for age, sex and medical conditions, results demonstrate that high BMI and severely large WC still positively influenced doctors advising weight loss (OR=3.6; 95% CI: 1.34–9.88; $p = .011$) and (OR=4.714; 95% CI: 1.64–13.58; $p = .004$). When controlling for occupation, BMI and WC, women became less likely to be advised by a doctor to lose weight (OR=0.42; 95% CI: 0.18–0.97; $p = .042$)

Patients who spoke Zulu were 6.3 times more likely to be advised by nurses to lose weight (OR= 6.3; 95% CI: 2.28–17.41; $p < .001$) than their counterparts. Those who had morbid obesity were 2.5 times more likely (OR= 2.5; 95% CI: 1.16–5.46; $p = .019$) and those with severely large waist sizes were 2.8 times more likely (OR=2.8; 95% CI: 1.243–6.082; $p = .013$). The results also show that divorced and widowed patients were less likely to be advised by nurses to lose weight (OR= 0.29; 95% CI: 0.1–0.83; $p = .022$) and (OR=0.29; 95% CI: 0.09–0.93; $p = .038$). These factors remain unaffected after controlling for age, sex, education, employment status and medical condition.

Factors influencing clinicians' follow-up of obese patients after prior advice for weight reduction

Logistic regression analysis showed that young patients aged 26–35 were 18.9 times more likely to be followed up after initial advice to lose weight than their counterparts

(OR= 18.9; 95% CI: 2.1–169.8; p= .009). Those with class 3 BMI were three times more likely to be followed up (OR= 3; 95% CI: 1.1–8; p= .026), while those with very large WC were also 3.6 times more likely to be followed up (OR= 3.6; 95% CI: 1.8–7.1; p< .001).

DISCUSSION

This study aimed to assess obese patients' dissatisfaction with weight and body image and their perspectives of interaction with clinicians in a primary care setting. The findings demonstrate that most obese patients attending Dr Yusuf Dadoo District Hospital's outpatient department were middle-aged adult women. Most of the patients spoke Tswana and Afrikaans, had completed secondary school and were employed. A large proportion of patients were married, severely obese, and demonstrated a very high level of CVD risk. The majority either suffered from metabolic disease or were multimorbid. These findings are broadly consistent with the 2016 Statistics South Africa report on health surveys concerning obesity[7]. Although the survey did not account for the employment and marital status of obese individuals, it showed that obesity was associated with a high level of wealth. These findings are also consistent with trends previously reported in South Africa and other parts of the world[7,8,42].

Popular beliefs and previous studies showed that larger body size is socially or culturally accepted and has been normalised in many parts of South Africa and the world.[30,31] In sharp contrast, this study's findings show that most obese patients reported unhappiness with their current weight and perceived body image. Many stated they had thought of losing weight, and a significant proportion reported to have previously attempted weight reduction. These findings, for example, partly diverge from the SANHANES-I report on weight management and body image, which showed that most South Africans were happy with their body size, although only 42% of the study participants correctly linked their desired body size with their perceived one[6], thus demonstrating a greater level of body image dissatisfaction. The discrepancy between the current study results and those previously reported in the literature could be explained by increased public awareness of the risk associated with obesity and the desire to stay fit and healthy.[30–32] Also, the emerging shift in attitude to excessive weight as more people are exposed to western media that portrays slimness as ideal and fashionable[43]. A good example is the emerging popularity of 'fitspiration' or 'fitness inspiration', promoting healthy living through exercise and a healthy diet.[44] However, a

counterargument to this is the increase in the number of social media exposés that support the body positivity movement, which promotes the acceptance of each body type and size[29], though critics consider this as a way of promoting obesity and unhealthy behaviour. This ambiguity in the social media environment has been highlighted recently.[29,44,45]

The study results show that most patients were comfortable discussing weight reduction measures with clinicians, largely with nurses, than with doctors, although they mostly received advice from doctors and less from nurses. These findings demonstrate an underutilisation of the full potential of nurse-led intervention in the fight against obesity at the primary care level, which has shown to be effective in other parts of the world[46]. Moreover, even though all the patients in the study sample were recommended by a clinician to lose weight at some point, only six percent thought the information received was adequate. Most patients either received no information or found it insufficient to help them succeed with weight loss. In addition, the amount of information received was significantly associated with the patient's age, BMI and WC. These findings highlight discrepancies between obese patients' expectations of the clinicians' role and the level of assistance they receive in clinical practice.[15,24,47] They further demonstrated the need for clinicians to adjust their attitude to obese patients' willingness to engage in weight reduction measures and to consider improving the quality of care provided to the obese population.[23,24,48]

The study results suggested that clinicians' provision of advice for weight reduction was significantly associated with morbid BMI and severely large WC. These findings corroborate previous reports, showing that primary care clinicians tended to manage obesity proactively when patients were perceived to be in a morbid state or had accumulated extremely severe CVD risk[18]. It has also been found that clinicians often underestimate their role in preventing and controlling overweight and obesity.[15,49–51] When adjusting BMI and WC with employment status, employed obese women were less likely to be advised by doctors to lose weight. This is in sharp contrast with previous findings, suggesting that patients with better socioeconomic status were more likely to engage healthcare providers about weight management.[52] It has also been shown that compared to men, employed obese women are more likely to be absent from work due to weight-related problems.[53]The researcher speculates that the study's finding of discriminatory attitude on the part of the doctors toward employed, obese women could

be explained by the high ratio of male to female doctors who have to engage a majority of female patients on a sensitive subject such as obesity.[54] However, further studies are needed in this regard. Nurses' advice was also strongly related to the patient's language and marital status. They were 6.3 times more likely to advise patients who spoke Zulu and less likely if patients were divorced or widowed. These findings highlight the previously reported bias clinicians demonstrate in the management of obesity.[55,56] However, they also highlight the need for tailored, culturally sensitive interventions in managing obesity. Several authors have previously advanced this argument, although others found this had little effect on obesity prevention and control.[57–59]

This study found that only one out of five patients who were advised to lose weight reported to have been followed up, and this follow-up was more likely to occur if patients were young and morbidly obese. This study further demonstrated that, while clinicians could initiate discussion on weight reduction, the benefit to obese patients was minimal due to the information provided and the lack of follow-up to optimise patients' weight reduction measures. Previous studies have attributed clinicians' inability to provide adequate information and follow-up of obese patients to their biased attitude, limited knowledge, poor understanding of their role and deficiencies in the healthcare systems.[15,19,20,34]

The literature suggests that clinicians' and obese patients' challenges in addressing obesity in primary care can be due to multiple factors, such as time constraints, clinicians' and patients' attitudes towards obesity, clinicians' level of knowledge and experience and the availability of resources.[18–25] This study's findings have highlighted previously reported trends in managing obesity at the primary care level. However, it has also brought some new results that contradict previous beliefs and others that warrant further studies.

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Strengths and limitations

This is the first study in West Rand exploring the relationship between obese patients' dissatisfaction with weight and body image and their perspective of interaction with clinicians at the primary care level. It is also the first of it kind in South Africa.The study focused on the frequency of weight and body image dissatisfaction and did not account for the reasons of dissatisfaction. Recall bias could have affected the reliance on patients' self-reported information. Although the study demonstrate a high prevalence

of weight and body image dissatisfaction in the obese population attending the district hospital, these findings need to be interpreted in the context of a mixed cultural divide since ethnicity has been find to affect obesity perception. Also, while the study findings might suggest a societal shift in obesity perception,this need to be tested in more settings.

Recommendations

Obese patients perceived inadequacies in their interaction with clinicians can be improved by training clinicians on obesity awareness, communication skills and a strategic approach to weight loss intervention at the primary care level. The diverging high rate of weight and body image dissatisfaction among obese patients in the study compared to previous reports might signal a social shift in obesity perception that warrants large-scale investigations such as a second SANHANES study. Also, further studies are required to explore why doctors are less likely to recommend weight loss to employed, obese women.

CONCLUSION

This study's findings have shown that, contrary to popular belief, most obese patients are dissatisfied with their weight and body image. However, they perceived their interaction with clinicians at Dr Yusuf Dadoo District Hospital as inadequate for the level of help they need to achieve satisfactory weight loss. The study results also demonstrate that obesity management in primary care demands further clinicians' education.

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