

# The prevalence and perception of obesity and its association with the lifestyle of women at the Mangaung University Community Partnership Project healthcare centre, Bloemfontein

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## Abstract

**Background:** This investigation was prompted by the increase of obesity in developing countries with the simultaneous increased risk of preventable noncommunicable diseases. We aimed to determine the prevalence of obesity among women serving a predominantly black peri-urban community, who visited a healthcare centre in Bloemfontein. We also wanted to establish their perceived weight status, and any correlation between obesity, level of education, employment status and monthly income.

**Method:** A cross-sectional analytical design was used. In June 2007, clinic-attending women aged 18-50 years were selected by a systematic sampling method to participate in the study. A self-administered questionnaire investigated participants' socio-economic status, body image perception, psychological well-being, self-reported health status and physical activity. Body mass indices (BMIs) were calculated from weight and height measurements.

**Results:** A total of 304 women completed the study, of whom 98 (32.2%) were overweight and 134 (44.1%) were obese, with a mean BMI of 30.1 kg/m<sup>2</sup> [standard deviation (SD) 6.9 kg/m<sup>2</sup>]. More than half (53.4%) of the obese women perceived themselves as not obese. Approximately 84% of the participants were educated to secondary level, or higher. A significant difference in the employment status of the obese and non-obese participants (26.9% and 16.5% employed, respectively) was noted (p-value = 0.0013). The obese participants reported significantly less low self-esteem (29.5%) than the non-obese participants (42.4%) (p-value = 0.0250).

**Conclusion:** The high prevalence of overweight and obesity, and the fact that 53.4% of the obese participants did not perceive themselves as such, poses a challenge for healthcare providers. Health-promotion strategies should aim to inform women about the health risks of overweight and obesity, and address misconceptions regarding perceived weight status.

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## Introduction

In 2005, the World Health Organization (WHO) estimated that more than one billion people worldwide were overweight [body mass index (BMI)  $\geq 25$  kg/m<sup>2</sup>], and that more than 300 million were obese (BMI  $\geq 30$  kg/m<sup>2</sup>). The global increase in excessive weight can be directly attributed to changes in dietary habits and increasing levels of physical inactivity. Only 10 risk factors, of which the leading five are

hypertension, tobacco smoking, elevated blood glucose levels, inactivity and excessive weight (overweight and obesity), are responsible for 33% of deaths worldwide. These risk factors are closely associated with an increased risk of chronic diseases such as cardiovascular disease, ischaemic cerebral incidents, type 2 diabetes mellitus and certain malignancies.<sup>1</sup> In patients suffering from obesity, risk factors such as high blood pressure, hypercholesterolaemia and diabetes mellitus are more difficult to control in persons

with an increased BMI, resulting in an even more perilous clinical profile in many of these patients.<sup>2</sup>

According to the WHO, overweight and obesity contribute to 44% of the world's diabetes burden and 23% of the ischaemic heart disease burden. In Africa, 41% of deaths in people younger than 60 years of age are caused by overweight- and obesity-related conditions, as opposed to 18% in high-income countries.<sup>1</sup> According to statistics recently released by the Centers for Disease Control and Prevention (CDC) in the USA, 63% of patients with diabetes are obese, as opposed to 31% of non-diabetics. Forty-nine per cent of persons with hypertension, and 27% of normotensive persons, are obese.<sup>3</sup> In addition, physical inactivity, which is closely associated with obesity, can be related to 21-25% of the global breast and colon cancer burden, 27% of the diabetes burden and approximately 30% of the ischaemic heart disease burden.<sup>1</sup> In a study conducted in the Limpopo Province, Cook et al<sup>4</sup> reported that relatively low levels of activity, measured as walking less than 10 000 steps per day, were associated with an increased obesity risk of more than 80%.

In low- and middle-income countries, the combined burden of diet-related risks and physical inactivity is being regarded as equivalent to that resulting from HIV/AIDS and tuberculosis.<sup>1</sup> Noncommunicable diseases and their associated risk factors, including obesity, were found more commonly among the poorest communities in all countries,<sup>5-7</sup> and occurred at younger ages in developing countries.<sup>8</sup> Monteiro et al<sup>7</sup> noted that low-income Brazilian women were significantly more susceptible to obesity than their high-income counterparts, and observed an increase in obesity among poor women from 4.7% in 1975 to 12.6% in 1997, as opposed to an increase of only 1.1% in wealthy women over the same period of time. Ziraba et al<sup>9</sup> reported that although overweight/obesity was more prevalent among the wealthiest of urbanised women in seven different African countries, an increase in overweight/obesity by 46% over a 10-year period was noted among the poorest, as opposed to only 7% among the richest. Furthermore, the prevalence of overweight/obesity increased by 45-50% among non-educated and primary-educated women, while it dropped by approximately 10% among women with secondary or higher education.<sup>9</sup> On the other hand, it was found that hypertension and obesity increased with increasing wealth in the South African population.<sup>10,11</sup> Schneider et al<sup>10</sup> predicted that the burden of chronic diseases might become difficult to manage with future socio-economic development in the country, unless comprehensive health-promotion strategies are implemented. In another South African study, Case and Menendez<sup>12</sup> found that women who

were nutritionally deprived in childhood, as well as those of higher socio-economic status, were significantly more likely to be obese, as opposed to men who faced greater risks due to these factors.

One of the major challenges with regard to the management and prevention of obesity in South Africa is the cultural variation in the perception of and preference for bigger body sizes. Black South African women usually regard increased body mass as a sign of wealth, marital harmony and sufficient food supply.<sup>13,14</sup> Venter et al<sup>14</sup> conducted an investigation in which it was found that 52.7% of black women between the ages of 25-44 were either overweight or obese. In this study, 50.9% of participants regarded overweight and obese figures as healthy, while 39% of participants indicated these figures as being most attractive. With regard to obesity, they indicated that in their community's view, it reflected prosperity or material and financial wealth (48.6%), physical health (52.8%), and attractiveness (40.2%), and that an underweight person was not regarded as affluent (80.2%), healthy (64.3%), or attractive (63.7%).<sup>14</sup>

Obesity does not only pose serious and potentially life-threatening health risks. It also has a considerable impact on the obese person's psychological and emotional well-being,<sup>15-17</sup> self-esteem,<sup>18</sup> quality of sleep,<sup>19</sup> functional abilities and daily activities,<sup>18,20,21</sup> and life expectancy.<sup>22-24</sup> Treatment of related conditions, the use of preventive measures such as pharmaceutical agents, weight reduction programmes and special dietary supplements, and surgical procedures attempting to reverse existing weight problems, are expensive.<sup>25,26</sup>

The objectives of our study were:

- To determine the prevalence of obesity among women visiting the Mangaung University Community Partnership Project (MUCPP) healthcare centre in Bloemfontein;
- To determine their perceptions of weight status; and
- To investigate whether a correlation between obesity, level of education and monthly income could be found.

## Methods

MUCPP is a community healthcare centre that acts as a clinic for surrounding community members, as a referral centre for primary healthcare clinics, and as a centre for follow-up of down-referrals of stabilised secondary hospital patients. The centre is situated in Mangaung in a peri-urban environment, serving clients from both formal and informal housing settlements. Most patients attending the service are black. Services at the clinic are free of charge and easily accessible.

A cross-sectional analytical study was conducted. Women between 18-50 years of age who attended the MUCPP healthcare centre in June 2007, and who were seated in the general waiting room, were selected by a systematic sampling method, which required that every second consenting woman participate in the study.

A self-administered questionnaire was designed to capture information regarding demographic details, education levels, socio-economic status, health- and physical activity-related factors, as well as psychological factors. Completion of the questionnaire was facilitated by the researchers in cases where assistance was indicated. Each participant's weight and height were measured in kilograms and metres respectively, using standard procedures and equipment. Participants were requested to remove heavy clothes such as coats, jackets and jerseys, if necessary, as well as shoes and hats. The BMI, expressed as  $\text{kg}/\text{m}^2$ , was calculated and recorded on each individual's questionnaire. To determine psychological well-being, participants answered yes/no questions referring to self-esteem, anxiety and depression. No additional validated questions were used. Questionnaires were available in English and Sesotho. The results could have been influenced in cases where participants misunderstood the questions. To determine their weight status perceptions, participants had to choose one of three options regarding their perception of self: underweight, normal weight or overweight. No additional validated questions were asked. To determine the influence of the media on perceived weight status, participants were asked whether they read magazines, and if so, whether images of female bodies in the media had an influence on their feeling either positive or negative about their own body weight. If so, they were asked whether these feelings motivated them to attempt to lose or gain weight. No specific questions regarding specific dietary measures were included in the questionnaire.

Before the main investigation, a pilot study was conducted at the MUCPP healthcare centre, using a sample of 20 participants. The questionnaire and measuring methodology proved to be effective and no adjustments were required.

The Ethics Committee of the Faculty of Health Sciences, University of the Free State (UFS), approved the study, and permission was also obtained from the director of the MUCPP healthcare centre. Participation was voluntary, and participants were assured of confidentiality and that no penalty would result if they discontinued their involvement or refused to participate. Written informed consent was obtained from each participant.

Analysis of the data was conducted by the Department of Biostatistics, UFS. The results were summarised by

frequencies and percentages for categorical variables and means and standard deviations for numerical variables. Obese and non-obese participants were compared using 95% confidence intervals (CI) for differences in means, chi-squared or Fisher's exact tests, as appropriate.

## Results

The study sample comprised 304 women, of whom 303 were black and one was coloured. The mean age of the participants was 28.3 years (SD 8.8 years). One hundred and thirty-four (44.1%) participants were found to be obese and 98 (32.2%) were overweight. The mean age of the obese group was 30.6 years (SD 7.5 years), while the non-obese women had a mean age of 26.6 years (SD 9.3 years). The obese participants were significantly older than the non-obese group, with the 95% CI (2.0 ; 5.9 years) for the difference in mean age. The lowest BMI calculated was  $13.7 \text{ kg}/\text{m}^2$  and the highest  $54.6 \text{ kg}/\text{m}^2$ , with a mean of  $30.1 \text{ kg}/\text{m}^2$  (SD  $6.9 \text{ kg}/\text{m}^2$ ). The distribution of participants per BMI category is shown in Table I.

Table I: Distribution of women between the ages of 18-50 years with regard to BMI

Category <sup>27</sup>	BMI value ( $\text{kg}/\text{m}^2$ ) <sup>27</sup>	Number of women (n = 304)	%
Underweight	< 18.50	3	1.0
Normal	18.50-24.99	69	22.7
Overweight	25.00-29.99	98	32.2
Obese	$\geq 30.00$	134	44.1

Results with regard to employment, type of employment, education and income are shown in Table II. More than 60% of both obese and non-obese participants were unemployed. The distribution of employment status differed significantly between the obese and non-obese groups ( $p$ -value = 0.0013), with 20.6% of the non-obese participants being full-time students, compared to 6.7% of the obese participants. In the obese group, more than 50% of women indicated that they earned a personal income of less than R1 000 per month. Information was lacking for 13 participants in this group. No information with regard to education was available for 16 of the obese and seven of the non-obese participants. The majority of participants (83.9% of the obese and 84.0% of the non-obese) for whom information was available, were educated to secondary level or higher. In the non-obese group, information was available for 151 respondents, of whom 53.6% indicated that they had no personal income. The differences observed between the two groups with regard to income were statistically significant ( $p$ -value = 0.0061).

Table II: Employment, type of employment, level of education and income of obese and non-obese women seen at MUCPP healthcare centre

Employment	Obese (n = 134)		Non-obese (n = 170)	
	n	%	n	%
Unemployed	89	66.4	106	62.4
Employed	36	26.9	28	16.5
Full-time student	9	6.7	35	20.6
Employed and part-time student	0	0.0	1	0.6
Type of employment	Obese (n = 35)		Non-obese (n = 24)	
Unskilled and manual	13	37.1	12	50.0
Skilled and manual	8	22.9	3	12.5
Skilled and not manual	8	22.9	9	37.5
Other (e.g. volunteer, entrepreneur)	6	17.1	0	0.0
Level of education	Obese (n = 118)		Non-obese (n = 163)	
No education	6	5.1	14	8.6
Primary	13	11.0	12	7.4
Secondary and higher	99	83.9	137	84.0
Level of personal income	Obese (n = 121)		Non-obese (n = 151)	
Less than R1 000 per month	63	52.1	57	37.8
R1 000-R3 000 per month	14	11.6	10	6.6
More than R3 000 per month	4	3.3	3	2.0
No personal income <sup>a</sup>	40	33.1	81	53.6

<sup>a</sup>No information was obtained about the participants' total monthly household income, as the questionnaire item did not make provision for spouses' and partners' incomes

Thirty-nine (29.1%) of the obese women indicated that they participated in jogging, sports or exercising in a gymnasium, while 54 (31.8%) of the non-obese women were involved in such activities.

With regard to perceptions of their own weight, 86 (28.6%) of the participants who answered this questionnaire item (n = 301) perceived themselves as obese, of whom 62 (72.1%) were truly obese. Of the 215 participants who did not regard themselves as obese, 71 (33.0%) were in fact so. Further assessment of data showed that more than half (53.4%) of obese women perceived themselves as not obese, as opposed to 14.3% of the non-obese participants who believed that they were.

Out of the 86 women who perceived themselves to be obese, 19 (22.1%) were attempting to reduce their weight through diet and exercise. Sixteen (84.2%) of these participants were obese. Two hundred and nineteen (72.0%) of the participating women indicated that they read magazines, of whom 127 (58.0%) said that images portrayed in the media influenced them either positively or negatively. The remaining participants (42.0%) either felt self-confident, or were not influenced by images in the media.

Table III: Association between weight and participants' health and psychological well-being

	Obese		Non-obese		p-value
	n	%	n	%	
<b>Self-reported health status</b>					
Hypertension	21	15.7	23	13.5	0.5981
Coronary heart disease	7	5.2	12	7.1	0.5117
Diabetes mellitus	3	2.2	3	1.8	1.0000
<b>Other health-related issues</b>					
Tiredness	81	62.8	84	51.2	0.0474
Menstrual disorders	56	43.8	68	42.5	0.8314
Digestive complaints	42	34.1	53	33.8	0.9457
<b>Psychological effects</b>					
Anxiety	51	41.5	81	48.4	0.1716
Depression	46	36.5	73	44.0	0.1983
Low self-esteem	36	29.5	70	42.4	0.0250

Table III shows the participants' feedback with regard to the association between their weight, self-reported health problems and psychological well-being.

Amongst obese participants, 15.7% were known to be hypertensive, 5.2% had known ischaemic heart disease and 2.2% reported that they were diabetic. Results were similar for non-obese participants: hypertension (13.5%), ischaemic heart disease (7.1%) and diabetes (1.8%). Sixty-three per cent (62.8%) of obese opposed to 51.2% of non-obese participants reported tiredness.

## Discussion

On 24 February, 2010, in her opening address at the Global Noncommunicable Diseases Network Forum, Dr Margaret Chan, the Director-General of the WHO, emphasised that unhealthy diets, physical inactivity and a high BMI were among the major factors contributing to the development of various chronic, life-threatening diseases. However, while, until recently, these problems have been associated with affluence, developing countries are now regarded as the most vulnerable, and have the least resilience and the most limited capabilities with which to manage the burden of lifestyle-related diseases.<sup>5</sup>

In our study, a high prevalence of overweight (32.2%) and obesity (44.1%) was noted in a group of black women (18-50 years) in Mangaung. Although slightly lower, our findings correspond with those of Flegal et al,<sup>28</sup> who noted a prevalence of obesity in 49.6% of African American women  $\geq$  20 years of age. The South African Demographic and Health Survey (SADHS) refers to a study in 1990 in which the prevalence of obesity in Mangaung African women was 43.9%. The same survey reported a prevalence of 26.7%

and 31.8% for overweight and obesity respectively in 1998.<sup>29</sup> With the increase in noncommunicable diseases in developing countries, one could expect a higher prevalence here in South Africa than what is currently being experienced. Malhotra et al<sup>30</sup> reported a 24.7% and 53.4% prevalence of overweight and obesity respectively, in a survey carried out in 2005 in Khayelitsha in the Western Cape. The increasing prevalence of overweight and obesity amongst black South Africans warrants attention.

The significant difference in the mean age of the two groups (obese group, 30.6 years old; and non-obese group, 26.6 years old) showed that older women had a greater tendency to be obese than their younger counterparts. This finding could be substantiated by a report from the CDC, stating that 29% of 20-39-year-old and 39% of 40-59-year-old individuals in the USA were obese.<sup>3</sup> Healthcare providers should focus on changing the weight status perception of young black woman to prevent them from becoming overweight and obese adults.

In our study, the majority of participants (83.9% of obese and 84.0% of non-obese women) were educated to secondary level or higher. With regard to different education levels, no statistically significant difference between obese and non-obese women was observed. Although several studies report an association between education and overweight, this was not the case in the study by Malhotra et al.<sup>30</sup> However, a limitation of our study was that the questionnaire did not distinguish between secondary education up to completion of Grade 12 and incomplete (some) secondary education. Based on the 2001 census, 13.6% and 5.2% of the total Free State Province population completed secondary education and obtained a higher qualification respectively, while 33.7% had some secondary education, or in other words, did not complete Grade 12.<sup>31</sup> In the 2007 Community Survey it was found that approximately 28% of the total South African population aged 20 years and older had completed secondary education,<sup>32</sup> while 41% of South African black adults older than 20 years of age had some secondary education.<sup>33</sup> However, it should be kept in mind that the participants in our study were limited to people between the ages of 18-50 years. Therefore, our findings could not be compared to the national trend for this particular age group, as no statistics could be located with regard to the level of education among different adult age groups in South Africa.

Despite the relatively high percentage of participants in our study with secondary or tertiary education, 33.1% of the obese and 53.6% of the non-obese participants indicated that they had no personal income, while 52.1%

and 37.8% of obese and non-obese women, respectively, reported an income of less than R1 000 per month. Only a small percentage of participants (3.3% of obese and 2.0% of non-obese women) earned a monthly income of more than R3 000. It could therefore not be concluded from our findings that obesity was unequivocally linked to poverty in this particular group of women. It should further be noted that the questionnaire only enquired about personal income, and did not make provision for total household income.

The rate of unemployment was exceptionally high in this particular group of women, with 66.4% of the obese and 62.4% of the non-obese participants being unemployed. At the time of the study (2007), the unemployment rate among women between the ages of 15-65 years of age in South Africa was 26.7%.<sup>34</sup> By the end of 2009, the unemployment rate in the Free State Province was 25.3%, while 28.6% of all black people and 26.0% of women in the total South African population were unemployed.<sup>35</sup> The fact that the services at MUCPP are free of charge is the most likely explanation for our study participants' low income, and this could also possibly explain the high unemployment rate of participants. MUCPP is a down-referral clinic from secondary hospitals where patients may have scheduled bookings for follow-up of chronic diseases such as hypertension and diabetes. However, employed and more affluent patients also utilise MUCPP's services.

The CDC<sup>3</sup> reported that in 2006, physical inactivity was noted among 39% of Americans  $\geq$  18 years of age, with 48% of black people, 35% of white people, and 40% of women being physically inactive. According to these statistics, lack of exercise was strongly associated with level of education attained, and occurred in 67% of individuals with a school education of lower than Grade 9 and 59% of persons with Grade 9-11. Physical inactivity occurred among 23% of college graduates. Only 7% of persons with less than Grade 9 schooling participated in vigorous physical activity on a regular basis, compared to 33% of college graduates.<sup>3</sup> In our study, 29.1% of obese and 31.8% of non-obese participants indicated that they participated in physical exercise. Sixty per cent (60%) of obese, and 62.5% of non-obese, women performed manual labour, although their work-related level of physical activity was not indicated. Another deficit of the study was that the frequency, intensity and duration of physical activity were not reported. Therefore, it could not be determined whether physical activity was mild, moderate or vigorous in this particular group.

Only 15.7% of the obese patients reported known hypertension, while only 2.2% were aware of being diabetic.

The fact that obesity occurs in 49% of hypertensive patients<sup>3</sup> raises the question whether or not some of the obese participants were hypertensive cases, and overlooked as such. A similar argument is applicable for diabetics. The fact that MUCPP has hypertension and diabetes follow-up clinics with set appointments for patients contributes to our argument of overlooked cases. The 1998 SADHS refers to a self-reported prevalence of 14% for hypertension and 4% for diabetes in African urban settings, which corresponds with our findings.<sup>29</sup> The national prevalence of hypertension in black women is reported to be 25%. The prevalence of diabetes ranged between 5% in Gauteng and 8% in Cape Town, in studies conducted in the early 1990s.<sup>36</sup>

Although not statistically significant, slightly more non-obese than obese participants (48.4% and 41.5% respectively) reported that they experienced anxiety. The higher percentage of non-obese patients feeling depressed (44%) and reporting low self-esteem (42.4%), in comparison to obese patients who reported depression and low self-esteem in 36.5% and 29.5% of cases respectively, could relate to the finding of Venter et al.<sup>14</sup> The possibility that participants could have misinterpreted the meaning of self-esteem, anxiety and depression could have influenced the results of our study. Venter et al noted that in the black population, larger body size was associated with a perception of attractiveness, health and prosperity. Although diseases such as depression and HIV/AIDS can present with a low BMI, only one per cent of our participants fell in the underweight category. The odds of co-morbid depression are 41% greater in obese than in non-obese African American women, according to a large national study,<sup>37</sup> which contradicts our finding that non-obese participants were more at risk.

The results of this study showed that obese women were inaccurate regarding their perceived weight; 53.4% believed that they were not obese. Faber and Kruger reported that only 30% of obese women in a rural black community perceived themselves to be too fat.<sup>38</sup> The SADHS stated that 22.1% perceived themselves to be overweight, whereas 56.6% were indeed overweight and obese.<sup>29</sup> A study among predominantly Afrikaans-speaking (Caucasian) university students reported that overweight students were significantly more inclined to be realistic about their perceptions of weight and weight goals. Cilliers et al stated that 92.3% of overweight students indicated that they were overweight, and 88.5% of underweight students perceived themselves as being of normal weight.<sup>39</sup> In a USA study among adolescents of different race/ethnicity, it was reported that 45.2% of African American adolescents had misperceptions regarding their overweight status, compared to 28.2% of Caucasians.<sup>40</sup> The significance of our

findings is that misperception about overweight in the black population is not an exclusively South African phenomenon. The management of a black overweight patient may involve counselling directed at recognition of the problem and the related risks. Emphasis should be placed on understanding what African woman understand about overweight and obesity, as well as the perceived risks.<sup>41</sup> About one-third of black African girls (10-18 years) participating in a qualitative study in Cape Town had contrasting views about the disadvantages of being fat and acknowledged the association of obesity with hypertension and diabetes.<sup>42</sup> Patient approach should be individualised depending on recognition of the problem, and acknowledging the fact that African women's views of ideal body size differ from those of their Caucasian counterparts.

Several studies refer to the influence of the media in promoting a thin ideal. African American susceptibility to advertisements depicting Caucasians has influenced the African American ethnic identity.<sup>41</sup> Although 219 (72.0%) of our study participants indicated that they read magazines, only 127 (58%) said that images portrayed in the media influenced them either positively or negatively. The remaining 42% reported feeling self-confident, or were not influenced by media images. A more detailed investigation is required to determine the impact of magazines and the media on the ideal weight perception of black women.

## Conclusion

The high prevalence of overweight and obesity found in this study, and the fact that more than half of the obese participants did not perceive themselves as being obese, poses a challenge for healthcare providers. Misconceptions may contribute substantially to the increase in the prevalence of obesity. People should be made more aware of their weight status, as an increased distortion in weight perception could prevent individuals from making the lifestyle changes required for weight loss and, subsequently, from enjoying the associated health benefits.<sup>43</sup> A comprehensive health-promotion strategy should be implemented in the Mangaung community, and each individual patient contact should be regarded as a preventive opportunity to identify overweight and obese patients at risk of developing noncommunicable diseases.

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