The relationship between female adiposity and physical attractiveness amongst adults in rural Ranaka village, Botswana

H Salome Kruger[a]* iD, **Tumelo Seru**[a], **Zandile J Mchiza**[b] iD and **John R Speakman**[c]

[a]*Centre of Excellence for Nutrition, North-West University, Potchefstroom, South Africa*
[b]*School of Public Health, University of the Western Cape, Bellville, South Africa*
[c]*Institute of Biological and Environmental Sciences, University of Aberdeen, Aberdeen, UK*
Corresponding author, Email: salome.kruger@nwu.ac.za

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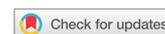
Objective: The aim was to assess the relationship between female adiposity and physical attractiveness among men and women in Botswana.
Design: A cross-sectional study was undertaken.
Setting: Ranaka rural village, Botswana.
Subjects: Randomly selected adults (*n* = 113, men = 48 and women = 65), 18–50 years old were recruited.
Outcome measures: Scores to indicate the attractiveness of 21 images of female bodies that represented different percentage body fat (%BF) according to participants' age, gender and body mass index (BMI) were recorded.
Results: The perceptions of physical attractiveness of female body size were similar among men and women, regardless of significant differences between the BMI of men and women. Younger (18–30 years) and older participants (31–50 years) separately, as well as underweight/normal weight versus overweight/obese groups all gave higher attractiveness scores for images with a lower %BF. All groups gave the highest score for the same image (%BF of 19% and waist:hip ratio (WHR) of 0.72), and the lowest score for an image with %BF of 49% and WHR of 0.81. There was a significant negative correlation between attractiveness score and %BF of the images for all groups, but no significant correlation between the attractiveness scores for the images and WHR. There was a consistent outlier in the graphs between attractiveness score and %BF with a % BF of 32% and a WHR of 0.61, with a relatively high score of 7.4 out of 9 for all groups.
Conclusions: Participant groups according to gender, age or BMI gave similar attractiveness scores for leaner female body images.

Keywords obesity, attractiveness, rural, Africa

Introduction

The obesity problem persists in many countries despite growing evidence on the development of effective strategies directed at promoting healthy eating and physical activity to reduce obesity prevalence globally.[1] Botswana as a developing country is not spared from this growing obesity pandemic.[2] Reports show a higher prevalence of overweight and obesity among women than in men.[1] Evidence suggests that perceptions of body image are associated with body size to a greater extent in women than in men.[3,4] In fact, studies suggest that some African populations have a higher tolerance for overweight and obesity, since they regard obesity as attractive.[3,5–7] There are limited data on body image in African countries such as Botswana. The only study we could access suggests that overweight and obesity among adolescents in Botswana are associated with body image dissatisfaction.[8] This study included mainly girls (61%) from an urban area and the mean age of students was 14.9 years.[8] As such, more studies need to be done to investigate whether or not obesity is considered as physically attractive, particularly in the rural adult population of African countries. Such information may help to develop targeted interventions to tackle the growing overweight and obesity problems in Africa. Furthermore, information on whether gender differentiates physical attractiveness preference and perceptions regarding body fat distribution in Africa will be useful.

The findings of such studies could help to highlight the importance of educating African adults about the risks associated with overweight and obesity and thereby dispel the perceptional myths regarding the attractiveness of a bigger body size and body fat distribution. It would also help nutrition professionals to develop targeted interventions to prevent and manage overweight and obesity among adults. For the purpose of this study we defined body adiposity as an abnormal increase in the proportion of adipose cells in the human body and attractiveness as having a pleasing appearance.[9] Thus, the purpose of this study was to fill the body image research gap in Botswana, a country in southern Africa, by focusing on the relationship between female body adiposity and physical attractiveness preferences among men and women.

Methods

Sample size selection

The sample for the current study was selected from people living in Ranaka rural village, where only indigenous Batswana are living. The study required a homogeneous population of a rural area in Botswana. Thus, Ranaka village was identified because almost all inhabitants in the village were born and raised in the village. Botswana citizenship was confirmed through their national identity documents. The study was introduced to participants by advertising it on posters displayed at the local shops, taxi rank, council office and clinic before recruitment started. The sample size was based on the protocol of an international study, which included participants from urban areas in 10 countries with sample sizes ranging from 53 to 260

per country.[10] From this international study, the results showed consistent relationships between study countries, irrespective of sample size, indicating that the sample size per country was large enough for the research question. The sample selection was stratified by gender and village ward. Ranaka village has four wards, with approximately 125 houses per ward. A trained fieldworker started at a central point in each ward and selected every fifth house in each street. She visited 25 to 30 randomly selected houses from each ward in an effort to recruit 120 study participants. Recruitment of men and women was done alternatively from one house to another in an attempt to recruit similar numbers of men and women. A total sample of 115 people agreed to participate, but two of the recruited persons withdrew their participation in the study, resulting in a total of 113 participants comprising 48 men and 65 women.

The protocol was approved by the Human Research Ethics Council of North-West University (project number NWU-00029-16-A1). An experienced and trained fieldworker obtained the informed consent in the village. All participants gave written informed consent.

Procedures and measurements

Data were collected in June 2016. The instrument used to collect data was a structured questionnaire and a series of 21 soft tissue dual-energy X-ray absorptiometry (DXA) images of the female body. The female body images used had been developed previously by an international team and were used to study the role of adiposity in the perception of physical attractiveness in United States college students[11] and were also used in a study of European, Asian and African populations.[10] The questionnaire comprised two sections. Section A had questions that elicited information on the sociodemographic characteristics of the participants, and their weights and heights were measured and recorded in this section.

The sociodemographic data included questions on the participant's age, gender, home language, education level, water source, type of toilet, fuel used for cooking and housing conditions to assess the participants' living conditions. Participants' weight and height were measured and recorded at the participants' houses. Participants' weight was measured on a digital scale (Seca, Hamburg, Germany) and height with a free-standing stadiometer (Seca, Hamburg, Germany). Measurements were taken twice for each variable and the means were calculated. BMI was calculated as weight (kg) divided by height (m^2).

Section B included instructions on the rating of the 21 body image cards from the least to the most attractive. The 21 female body images covered seven levels of percentage body fat (%BF) namely 15%–20%, 21%–25%, 26%–30%, 31%–35%, 36%–40%, 41%–45%, and 46%–50%. At each level of %BF there were three levels of waist:hip ratio (WHR), namely low (0.60–0.66), medium (0.67–0.75), and high (0.76–0.88). The body mass index (BMI) of these images ranged from 19 to 40 kg/m^2. These images were selected from a database of over 5 000 female DXA images and were specifically selected to minimise the link between %BF and WHR.[9]

The 21 image cards were shuffled and placed in front of participants in random order. The images used consisted of simple DXA shapes which did not reveal the colour of skin of the images, or their hair type or face. Participants were then asked to reorder the cards from the least attractive to the most attractive. The researcher then recorded the order of the images and confirmed with the subject that the order was indeed from least to most attractive and not the reverse.

Statistical analysis

Data were analysed using the Statistical Package for the Social Sciences (SPSS® version 23; IBM Corp, Armonk, NY, USA). Data were tested for the normal distribution using the Kolmogorov–Smirnov and Shapiro–Wilk tests. Means and standard deviations were used to present descriptive continuous data with a normal distribution, while medians and interquartile range were used to present data with a non-normal distribution. Percentages were used to present categorical data on the sociodemographic and anthropometric results. The median score for each female body image was first calculated in order to determine the association between female body adiposity and attractiveness score in the men and women separately. Following the protocol of the main study, the rankings were then converted to scores in the range 1–9 using the following equation: Score = 1 + (ranking −1) *0.4, with rankings ranging from 1 to 21.[10] The known level of %BF of each image (X-axis) was plotted against the median attractiveness ranking (Y-axis) for the total group and the subgroups separately. Regression lines were fitted and the R^2 of the regression equation was presented.

The Mann–Whitney test was used to determine the differences between scores of men and women and differences between the median scores of the young (18–34 years) and older persons (35–50 years). The attractiveness scores according to education level (no school education to primary school versus high school to tertiary education), as well as according to BMI category (underweight and normal BMI combined versus overweight and obese combined) were also determined. The Spearman correlation coefficient for the correlation between %BF of the DXA images and median scores of men and women were calculated separately. The p-value to define statistical significance was $p < 0.05$.

Results

A total of 113 (48 men and 65 women) participants with an age range of 18–50 years were included. The number of study participants across the four wards was evenly distributed ranging from 27 to 29 participants per ward. Participants from wards were of a similar gender distribution. The characteristics of the participants are presented in Table 1. Overall, overweight and obesity prevalence was higher in women (21.5% and 27.7%, respectively) than in men (8.3% and 2.2%, respectively). The housing conditions of the participants were relatively good, because 85% of the participants lived in houses made of bricks and 77% of the participants had access to clean safe water on their premises. However, a high percentage of the participants (72.9%) cooked with wood in open fireplaces instead of using electricity.

Overall, the perceptions of physical attractiveness of female body size in Botswana were similar among men and women, regardless of significant differences between the median BMI of the men (18.9 kg/m^2, IQR 17.7, 21.6) and women (24.8 kg/m^2, IQR 21.8, 30.9, $p < 0.0001$) presented in Table 1.

Table 2 shows the difference in scores given by men versus women. In general, there was some individual variation in scores for each image, as illustrated by the fact that some images received similar median scores. Table 2 also shows the differences in scores given by younger versus older age groups, those with lower versus higher school education (no

Table 1: Sociodemographic and anthropometric characteristics of the participants

Variable	Mean (standard deviation)/Median (interquartile range)/N (%)		p****
	Men ($n = 48$)	Women ($n = 65$)	
Age (years)*	30.1 (9.2)	34.1 (8.2)	0.02****
Weight (kg)**	55.8 (51.8, 64.3)	68.0 (54.4, 79.5)	< 0.001****
Height (m)*	1.73 (0.06)	1.60 (0.07)	< 0.001****
Body mass index (kg/m^2)**	18.9 (17.7, 21.6)	24.8 (21.8, 30.9)	< 0.001****
School education:***			0.58
No school	3 (6.3)	1 (1.5)	
Primary school only	10 (20.8)	19 (29.2)	
Junior high school	23 (47.9)	27 (41.5)	
Senior secondary school	7 (14.6)	10 (15.4)	
Tertiary education	5 (10.4)	8 (12.3)	
Toilet:***			0.67
Pit toilet	42 (87.5)	57 (87.7)	
Flush toilet	6 (12.5)	7 (10.8)	
No toilet, use veld	0	1 (1.5)	
Number of persons per household***	5 (3, 6)	5 (4, 7)	0.47
Number of persons per room***	1.00 (1.2)	2.00 (1.3)	0.07

*Mean (standard deviation); **median (interquartile range); ***n (%); ****significance of differences between men and women, t-test/Mann–Whitney U test/chi-square test.

schooling to primary school versus high school to education) and the underweight/normal weight versus overweight/obese categories. There were no significant differences between the median scores of any groups based on gender, age, educational status or BMI category.

Attractiveness rankings ranged from 1 to 21, with a ranking of 21 regarded as the most attractive and a ranking of 1 as least attractive. Unadjusted median rankings ranged from 1 to 17 and %BF of the images ranged from 19% to 50%. Scatter plots with regression lines of female attractiveness rankings for each of the images in relation to known %BF of the DXA image were generated in order to assess whether there was a link between adiposity of the images and attractiveness rankings given by the participants. Men and women were then considered separately to determine the differences between the attractiveness rankings they gave to different DXA images. Figure 1 shows the differences between median rankings of men and women for the different DXA images.

Regression lines were fitted to show the relationships between the attractiveness rankings given by participants in the different age groups. The linear regression lines were similar for the male and female groups ($R^2 = 0.81$ and 0.84, respectively). Moreover, these regression lines indicate negative correlations between the attractiveness rankings and %BF of the images ($r = -0.88$ and -0.90, respectively, $p < 0.0001$). This indicated that both males and females gave higher rankings to leaner images and gave lower rankings to images with a higher %BF (Figure 1).

Scatter plots with regression lines of female attractiveness rankings for each of the images in relation to known WHR of the DXA image were also generated. Similar inverse relationships for rankings of men and women were also found between attractiveness score and WHR of the images. The R^2 for both regression lines was smaller at 0.16 and 0.13, respectively, with no significant correlation between the attractiveness rankings of men and women and WHR of the images ($r = -0.41$, $p = 0.06$ and -0.38, $p = 0.09$, respectively). There were also no significant

correlations between the attractiveness rankings given by different age and BMI groups and the WHR of DXA images (data not shown).

Figure 2 shows the scatterplot of attractiveness rankings for different DXA images by normal weight/underweight participants compared with overweight/obese participants. The linear regression lines were similar for the two groups ($R^2 = 0.80$ and 0.85, respectively) and indicate negative correlations between the attractiveness rankings and %BF of the images ($r = -0.87$ and -0.91, respectively, $p < 0.0001$). This indicates that both groups with BMI below or above 25 kg/m^2 generally gave higher rankings to leaner images and lower rankings to images with a higher %BF. The Mann–Whitney test (test $Z = -1.21$, $p = 0.23$) shows no significant difference between these scores.

An image with a %BF of 19% and a WHR of 0.72 received the highest attractiveness rankings by all groups, while an image with a %BF of 49% and a WHR of 0.81 scored the least attractive of all 21 DXA images by the total study group and all groups separately. There was one outlier in the graphs showing a negative correlation between attractiveness rankings and %BF. The outlier was an image with a %BF of 32% and a WHR of 0.61, with a relatively high score of 7.4 out of 9 given by most groups. The expected standardised score based on the regression trend of other points was 5.4 for the total group.

Discussion

There are limited data regarding the perceptions of female attractiveness in relation to adiposity in Botswana. This cross-sectional study therefore sought to fill this research gap and assess the perceptions of female attractiveness in 18–50-year-old Batswana people using DXA images representing different body fatness. The key findings of this study therefore are that: (i) as in most countries where attractiveness rating has been studied,[12,13] this study also included more female participants (58%) than male participants (42%); (ii) there was a general agreement in attractiveness scores given to different body sizes between Batswana women and men, regardless of the

Table 2: Difference in attractiveness scores according to sex, age group, educational status and weight status (median, interquartile range).

Image number	Men (n = 48)	Women (n = 65)	Age 18–34 years (n = 53)	Age 35–50 years (n = 60)	Low education status (n = 33)	High education status (n = 80)	Underweight and normal weight (n = 76)	Overweight and obese (n = 37)
1	2.2 (1.4, 3.0)	2.2 (1.8, 3.4)	2.2 (1.4, 3.0)	2.2 (1.8, 3.4)	2.2 (1.4, 3.4)	2.2 (1.6, 3.0)	2.2 (1.4, 3.4)	2.2 (1.8, 3.2)
2	3.0 (1.8, 3.8)	3.0 (1.8, 4.6)	3.0 (1.6, 4.4)	3.0 (1.8, 3.8)	3.0 (1.6, 3.8)	3.0 (1.8, 4.4)	3.0 (1.8, 4.2)	3.0 (1.8, 3.8)
3	7.0 (5.4, 8.2)	7.4 (6.0, 8.6)	7.4 (5.4, 8.4)	7.2 (5.8, 8.6)	7.0 (5.4, 8.2)	7.4 (5.4, 8.4)	7.4 (5.8, 8.6)	7.0 (5.8, 8.4)
4	5.0 (3.5, 7.0)	5.8 (4.2, 6.6)	5.0 (3.4, 6.6)	5.4 (4.2, 6.9)	5.0 (3.5, 6.6)	5.0 (3.5, 7.0)	5.4 (3.8, 6.6)	5.8 (4.4, 6.8)
5	5.0 (3.5, 6.6)	4.6 (3.4, 6.2)	5.0 (4.2, 6.6)	4.6 (3.4, 6.2)	5.0 (3.4, 6.6)	5.0 (4.2, 6.6)	5.0 (3.8, 6.5)	4.6 (3.4, 5.8)
6	7.0 (5.1, 8.2)	7.4 (5.4, 8.2)	7.0 (4.8, 8.6)	7.0 (5.8, 8.2)	7.0 (5.1, 8.6)	7.0 (4.8, 8.6)	7.4 (5.8, 8.2)	6.2 (5.4, 8.2)
7	4.0 (3.0, 7.0)	3.8 (2.2, 5.0)	3.8 (3.0, 6.8)	3.4 (2.2, 5.3)	4.0 (3.0, 6.8)	4.0 (3.0, 7.0)	4.0 (2.6, 6.2)	3.4 (2.2, 5.2)
8	5.6 (4.2, 7.0)	5.4 (4.2, 7.0)	5.8 (4.2, 7.0)	5.0 (4.2, 7.0)	5.6 (4.2, 7.0)	5.8 (4.2, 7.0)	5.6 (4.2, 6.9)	5.8 (4.6, 7.2)

Image number	Men (n = 48)	Women (n = 65)	Age 18–35 years (n = 57)	Age 36–50 years (n = 56)	Low education status (n = 33)	High education status (n = 80)	Underweight and normal weight (n = 76)	Overweight and obese (n = 37)
9	7.4 (5.4, 8.6)	7.0 (5.4, 8.2)	7.4 (5.8, 8.4)	7.4 (5.4, 8.2)	7.4 (5.4, 8.2)	7.4 (5.8, 8.6)	7.4 (5.5, 8.2)	7.0 (5.4, 8.2)
10	2.6 (1.8, 3.3)	2.6 (1.8, 3.6)	2.6 (1.8, 3.8)	2.6 (1.8, 3.4)	2.6 (1.8, 3.6)	2.6 (1.8, 3.8)	2.6 (1.8, 3.4)	2.6 (1.8, 3.4)
11	7.0 (6.2, 7.8)	7.0 (5.8, 7.8)	7.0 (5.8, 8.0)	7.0 (5.9, 7.8)	7.0 (6.2, 8.0)	7.0 (5.9, 7.8)	7.0 (5.8, 7.8)	7.0 (5.8, 7.8)
12	6.4 (5.0, 7.8)	6.6 (5.4, 8.0)	6.6 (5.0, 7.6)	6.8 (5.4, 8.5)	6.4 (5.0, 8.0)	6.4 (5.0, 7.6)	6.6 (5.0, 7.8)	6.6 (5.4, 8.0)
9	7.4 (5.4, 8.6)	7.0 (5.4, 8.2)	7.4 (5.8, 8.4)	7.4 (5.4, 8.2)	7.4 (5.4, 8.2)	7.4 (5.8, 8.6)	7.4 (5.5, 8.2)	7.0 (5.4, 8.2)
13	3.0 (1.8, 4.2)	2.6 (1.8, 3.4)	2.6 (1.8, 4.2)	2.6 (1.8, 3.8)	3.0 (1.8, 4.2)	2.6 (1.8, 4.2)	2.8 (1.8, 3.8)	2.6 (1.8, 3.4)
14	1.0 (1.0, 2.2)	1.0 (1.0, 1.0)	1.0 (1.0, 2.2)	1.0 (1.0, 2.2)	1.0 (1.0, 1.0)	1.0 (1.0, 1.0)	1.0 (1.0, 1.4)	1.0 (1.0, 1.0)
15	7.4 (6.2, 8.2)	7.4 (6.4, 8.6)	7.8 (6.2, 8.6)	7.4 (6.2, 8.2)	7.4 (6.2, 8.6)	7.8 (6.2, 8.6)	7.4 (6.2, 8.6)	7.8 (6.6, 8.2)

| Image number	Men (n = 48)	Women (n = 65)	Age 18–35 years (n = 57)	Age 36–50 years (n = 56)	Low education status (n = 33)	High education status (n = 80)	Underweight and normal weight (n = 76)	Overweight and obese (n = 37)
16	3.8 (2.6, 4.9)	3.4 (2.4, 4.6)	3.4 (2.2, 4.6)	4.2 (2.7, 4.6)	3.8 (2.6, 4.6)	3.8 (2.2, 4.6)	3.8 (2.6, 4.6)	4.2 (2.2, 4.6)
17	6.2 (5.4, 7.7)	6.6 (4.4, 8.0)	5.8 (4.0, 8.0)	6.6 (5.4, 7.7)	6.2 (5.4, 8.0)	5.8 (4.4, 7.7)	6.0 (4.7, 7.8)	6.6 (5.2, 8.0)
18	4.2 (3.0, 5.8)	3.8 (3.2, 5.4)	4.2 (3.4, 6.0)	3.8 (3.0, 5.3)	4.2 (3.0, 5.3)	4.2 (3.0, 5.8)	3.8 (3.0, 5.4)	4.2 (3.2, 5.6)
19	3.4 (2.3, 6.1)	3.4 (2.6, 4.6)	3.4 (2.6, 5.2)	3.8 (2.6, 4.6)	3.4 (2.3, 5.2)	3.4 (2.3, 5.2)	3.8 (2.6, 5.0)	3.0 (2.6, 4.2)
20	6.0 (4.7, 7.0)	5.8 (4.6, 7.0)	5.4 (4.6, 6.6)	6.2 (5.0, 7.3)	6.0 (4.6, 7.0)	5.4 (4.7, 6.6)	5.8 (4.6, 7.0)	6.2 (4.8, 7.2)
21	6.6 (4.6, 7.8)	6.6 (5.4, 7.8)	6.6 (5.0, 7.8)	6.6 (5.4, 7.8)	6.6 (5.0, 7.8)	6.6 (4.6, 7.8)	6.8 (4.7, 7.8)	6.2 (5.6, 7.6)
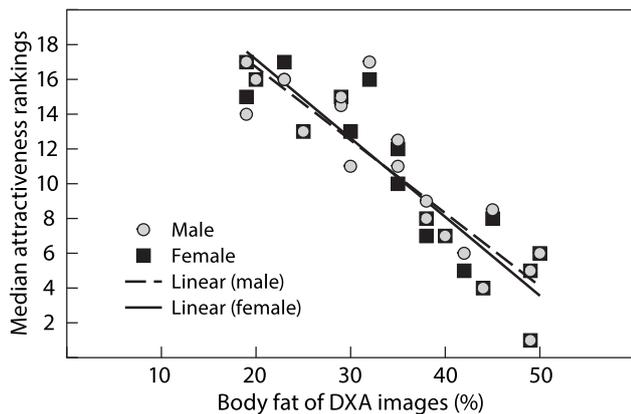
Figure 1: Comparison between the attractiveness rankings given by male and female participants to different DXA images according to percentage body fat.
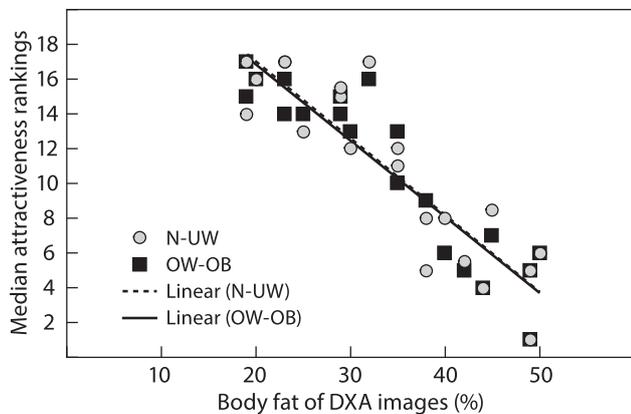

Figure 2: Comparison between the attractiveness rankings given by normal weight/underweight and overweight/obese participants to DXA images according to percentage body fat. (N-UW = normal weight and underweight; OW-OB = overweight and obese).

differences in their sociodemographic and anthropometric characteristics; (iii) this general agreement showed a negative correlation between the attractiveness scores and the %BF of the DXA images; this is an indication that both men and women gave higher scores for leaner images and lower scores for larger images.

These results are consistent with previous studies that suggest ratings of female attractiveness do not differ significantly between men and women in the same population, although the present study included only rural participants, while previous studies included mostly urban adults.[13–14] To fully comprehend the preference for a larger body sized female in the non-Westernised populations, especially in rural areas of Africa, it is important to note that people in rural areas in most African countries, including Botswana (Ranaka village), have limited resources. In most cases, they do not have electricity or significant amounts of household durable goods, as reported in another study in a rural population in Africa.[15] As such, women in rural populations are required to do a lot of manual labour including fetching firewood far from home. This requires physical strength. Therefore, among these populations, a bigger female body size may be perceived to have physical strength and good health.[5–7,15] The results of some studies also indicated that HIV/AIDS, a health condition that is high in Botswana and is associated with a lean body,

may influence the rankings of attractiveness of some participants, who might consider thinner women to be infected by this virus.[5] For these reasons the results of this study in a rural setting, showing higher scores for leaner images and lower scores for larger images, were unexpected.

Culture-dependent views

Body image and attractiveness rating perceptions and ideals differ within and between various cultural groups.[13] For instance, the importance of body adiposity and waist-to-hip ratio (WHR) seemed to be culture and socioeconomically dependent in a study undertaken in major cities in three Caucasian populations (Austria, Lithuania and the UK), three Asian populations (China, Iran and Mauritius) and four African populations (Kenya, Morocco, Nigeria and Senegal).[10] In fact, in this study, it was shown that in poorer communities a bigger female body may be considered attractive and a sign of evolutionary fitness. Body fatness could be equated with an increased potential to survive famine. However, in other parts of the communities, carrying larger fat stores could be equated with poor health and lower fertility in non-famine conditions.[10] Indeed, results of other studies agree that cultures with limited food supplies usually associate a larger body size with health, wealth, beauty, fertility and food security,[4–7] while most developed and Third World countries idealise female thinness and male muscularity. Weight and body images are important elements in the conception of physical attractiveness for many cultures, but each differs in its preferences.[11–14] In most cases, women in the USA regard a larger body size as unattractive and even tend to underestimate their body size.[16] Although the concept of an African preference for bigger body size is common across most African cultures, it differs between men and women in different countries.[17] In South Africa, it was reported that black women had a higher preference for a bigger body size than their white counterparts in studies including a majority of urban participants.[3,6] Similarly, in Ghana, urban women were more likely to rate bigger body sizes as ideal compared with female students in the United States.[16] Moreover, in Uganda, Furnham and Buguma[17] also compared British and Ugandan scores given by both male and female urban students and observed that Ugandans rated obese female images as more attractive than did the British. These results therefore highlight that African populations in general have different body adiposity preferences from the preferences of Western populations.

Physiological differences between race/ethnic groups

The physiological amount of human body fat differs according to sex and age. This evidence is supported by Womersley and Durnin[18] who found that there are different relationships between BMI and %BF in men and women in different age categories. The relationship between BMI and %BF also differs among different ethnic groups.[19] This BMI/%BF ratio seems to have a significant role in attractiveness rating in different ethnic groups.[20]

The role of waist-to-hip ratio (WHR) has been widely studied in relation to physical attractiveness in populations.[21–22] Although there was no clear link between the attractiveness scores given by the participants according to WHR of the DXA images used in the current study, images with a WHR of around 0.75 were rated most attractive. These results are supported by the findings of other studies that showed a WHR of 0.7 is perceived as most attractive by men and women.[10,20–22] One outlier image with a relatively high %BF (32%) and a small WHR (0.61) and a higher than expected score of 7.4 out of 9 given by most groups was identified. Although this image had a higher %BF

than other images that received high scores, the small WHR may be the reason why a higher score was given to this particular image. It is interesting to note that one study suggests a significant association between WHR and female attractiveness.[21] However, the images used in this study were line drawings, not scanned images of female bodies. Line drawings may have the potential to alter the true original appearance of a human body and therefore influence people's perceptions about attractiveness preferences. The lack of a clear significant relationship between WHR and attractiveness in the current study corroborates the results of Swami and Tovee[23] who proposed that WHR does not have an influence on female attractiveness perceptions.

Limitations of the current research

One limitation of the current study was the higher number of female than male participants. This could be attributed to the fact that this study was conducted at household level and in a rural area. The majority of men in rural areas work in the fields and care for livestock, while women stay at home to take care of children. This led to instances where male participants were difficult to recruit. Even though the study procedures were thoroughly explained to the participants, two participants were not willing to have their weight and height measured and had to be excluded from the study. From the results of this study it was not possible to determine what factors influenced the perceptions of female attractiveness in this study population, because there were no significant differences between the median scores of any groups based on gender, age, educational status or BMI category.

Conclusion

The purpose of this study was to focus on the relationship between female body adiposity and physical attractiveness preferences of men and women aged 18–50 years. The key finding of this study is that men and women from this rural village gave similar higher attractiveness scores to leaner DXA images than to larger images of the female body. There was some individual variation in scores for each image, but there seemed to be a general agreement in attractiveness scores for different sized body images. It seems that perceptions regarding an attractive female body size in this group of Batswana were not significantly influenced by age, BMI or level of education of the participants. Further research on factors influencing the perceptions of female attractiveness according to body size is warranted in rural populations in Africa.

ORCID

Zandile J Mchiza http://orcid.org/0000-0002-0846-3080
HS Kruger http://orcid.org/0000-0002-5365-1777

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