
**TUNISIAN WOMEN'S PERCEPTIONS OF
DESIRABLE BODY SIZE AND CHRONIC
DISEASE RISK**

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The purpose of this study was to assess attitudes towards body size of urban Tunisian women. Firstly, to determine body size satisfaction amongst women and investigate the body size that women associate with good health, high social status and individual desirability; and secondly, to study whether perception varies in different groups of society, to see if there is a difference of attitudes in younger women and those of higher socioeconomic status. A cross-sectional, population based study was conducted in a peri-urban area of the capital, Tunis with 203 randomly selected women, aged 18–52 years. They were asked to associate 31 items with 1 of 6 photographic silhouettes of different body size; BMI was measured and over half of women were overweight or obese ($\text{BMI} \geq 25 \text{ kg/m}^2$). Almost two-thirds of all women were dissatisfied with their current body size. A normal body size ($\text{BMI} 20\text{--}24 \text{ kg/m}^2$) was seen in the most positive light by Tunisian women, although some positive attributes were associated with overweight silhouettes. Obesity was seen as undesirable, associated with greediness and poor health. There was no marked preference by younger women for slimmer body sizes, as had been expected. However, there was a preference by women with higher socioeconomic status for slimmer body sizes for some items. The finding that Tunisian women did not prefer larger body sizes may suggest a preference for a slimmer norm, closer to that in Western societies.

KEYWORDS obesity, Tunisia, body size perceptions, weight satisfaction

INTRODUCTION

Like many other middle-income developing countries, Tunisia has a high and increasing prevalence of obesity. Over the last 20 years, the prevalence of obesity has evolved rapidly, especially in women and is estimated at 20.6% in women living in urban areas (Mokhtar et al., 2001) and up to 30.6% in urban areas in and around the capital (Ben Romdhane, 2002); these studies also have shown that obesity affects women around three times more than men. This rise in obesity is a symptom of a wider, rapid transition in economic terms, urbanisation and health (Mokhtar et al., 2001; Ben Romdhane et al., 2005), and Tunisia now appears to be in an

advanced stage of epidemiological transition with a marked shift away from communicable to non communicable disease (Bouguerra et al., 2007). This has been attributed to a change in lifestyles, and particularly to a change in dietary and physical activity patterns (Delpeuch and Maire, 1997; Popkin et al., 2001); but also to cultural factors, such as the desire for overweight and/or obesity, particularly for women.

Traditionally in 'Arab-muslim' culture, large body sizes for women are seen as desirable and associated with female beauty. Evidence for this comes from a range of literature (Bouhdiba, 1975; Chebel, 1995; Mokhtar et al., 2001) and also from widespread practices; for example, the Tunisian tradition of fattening women prior to marriage so that they may be more beautiful (Chebel, 1995; Beltaifa et al., 2002). From this historic literature, it appears that plumpness, but not necessarily obesity, is revered. Studies conducted in the North African and Middle East region are few, but those that exist remain inconclusive whether social norms for female body size are evolving towards a slimmer norm. The first of these studies, in Saudi Arabia (Rasheed, 1998), reported that a third of women had a preference for overweight (but not obese) body sizes. However ideal body size varied with education level, and those who were educated to a higher level tended to choose slimmer body sizes, and therefore an ideal that is closer to that of women in developed countries. A more recent study (Jackson et al., 2003) of Egyptian adolescents reported a preference for thin body sizes. However, those living in rural areas had most tolerance or acceptance of overweight, where it existed.

A recent study (Rguibi and Belahsen, 2006) in nearby Morocco indicated that women preferred larger body sizes and even obese women did not express a desire to lose weight. However, this study was conducted in the South of Morocco, which is described as traditional and probably not typical of the rest of Morocco. Studies in other parts of Africa indicate that obesity itself is seen either positively, associated with prosperity (Brown and Konner, 1987; Treloar et al., 1999; van de Sande et al., 2001) or viewed with ambivalence (Mvo et al., 1999; Walker et al., 2001; Prentice, 2005) or associated with greediness and chronic disease (Holdsworth et al., 2004).

In developed countries, particularly over the last 40 years, slimness and especially thinness (underweight) have been valued and obesity stigmatised. Thinness is associated with elegance, youth and self-control (Craig et al., 1999; Williams and Germov, 1999; Metcalfe et al., 2000) and this societal ideal can generate feelings of intense dissatisfaction,

even amongst women of 'normal' weight and provoke weight control behaviour that can influence physical and mental health negatively. Several studies have suggested that this exacerbates eating disorders, such as anorexia and bulimia nervosa (Flynn et al., 1998).

It is unclear whether the cultural ideal or social norm in Tunisia has evolved towards one resembling that of some developed countries, with a background of soaring obesity that now pervades all of Tunisian society, or whether the traditional model of the ideal woman caricatured by a plump, curvy figure, being force-fed for marriage endures (Chebel, 1995; Beltaifa et al., 2002). It is possible that this has changed, due to the 'modernisation' of Tunisian society and the changing portrayal of women in the media, where slim body sizes are valued and promoted.

The purpose of this study was to assess attitudes towards body size of urban Tunisian women and whether these seem to be evolving against traditionally held views in the context of rising obesity. Body size satisfaction amongst women is investigated and the body size that women associate with health, social status and individual desirability are assessed. How social norms vary in different groups of society are also explored, to see if there is a difference of attitudes in younger women and those of higher socioeconomic status. Women's understanding of terms used to describe weight are assessed, to see if these fit in with medical definitions. Lastly, perceptions and knowledge of healthy body size and chronic disease risk are investigated. The study's findings will help inform health promotion programmes that focus on promoting healthy weight in Tunisia.

METHODS

Population and Sampling

A sample of 203 households in a peri-urban area of Greater Tunis were randomly selected and one woman in each of these households aged 18–52 years was subsequently randomly selected and included in the present study. The age range was selected to include women of child-bearing age, and to avoid adolescent girls views and those of 'older' women, who represent different life stages. Pregnant women were excluded due to potential bias on weight measurements. This represented a sub-sample of a larger sample of a nationally representative study of epidemiological transition in Tunisia, of over 5000 subjects

based on household census data. The number of women surveyed was based on power calculations for the national survey for the region studied (Greater Tunis) and is therefore representative for the women of Greater Tunis.







Approval was granted for the study by the national ethical committee (visa n°5/2005). Informed oral consent was obtained from each subject during recruitment. Interviews were conducted in the individual's home during July–November 2005, by the same female psychologist (FT). Educational level, employment of head of household and/or interviewee and car ownership were used to indicate socioeconomic status.

The Questionnaire and Silhouettes

The questionnaire was based on one developed earlier and used with Senegalese women (Holdsworth et al., 2004) and consisted of items on: perceptions of body size; weight satisfaction; knowledge about diet and chronic disease; physical activity patterns; socio-demographic data; and anthropometric measures. Piloting ensured that the questionnaire was well understood. Women were asked five questions that assessed knowledge of the consequences of obesity on diabetes, cancer and cardiovascular disease risk, based on those developed for an earlier study (Holdsworth et al., 2006).

Subjects were asked to associate 1 of 6 silhouettes of female body size with 31 items, to draw out attitudes to body size. The silhouettes used were developed in a previous study (Bush et al., 2000) and had the advantage of being based on photographic silhouettes of individuals of known BMI (20–38 kg/m²), that conferred a 'neutral' appearance in terms of ethnicity. The 6 silhouettes were presented on each of 3 A4 cards (BMI and WHR values were not shown): the first ranked the individuals in ascending order of BMI (Table 1), while on the 2 subsequent cards they appeared in random order to avoid respondents becoming too accustomed to them (Furnham and Alibhai, 1983; Sobal and Stunkard, 1989). Two items assessed current body size (CBS) and ideal body size (IBS) so that body satisfaction could be calculated (Williamson et al., 2000); 3 items were used to assess lay understanding of weight definitions (normal, overweight, obese) (Table 1); 6 items were associated with social status, 7 related to healthier body size, and 13 items evaluated individual attributes (Table 2).

Table 1. Attitudes to body satisfaction and understanding of weight definitions

								
BMI	20	24	28	30	33	38		
BMI group	normal		overweight		obese		n Mean Δ \pm SD	
Silhouette	1	2	3	4	5	6		
<i>Body satisfaction</i>								
Current body size	-----▲-----						203	2.68 \pm 1.7
Ideal body size	-----▲-----						203	2.01 \pm 1.5
<i>Terms for body size</i>								
Normal	-----▲-----						203	1.91 \pm 0.9
Overweight	-----▲-----						201	4.36 \pm 1.1
Obese	-----▲-----						201	5.80 \pm 0.3


Anthropometric Measurements

Weight was measured using scales accurate to 100 g. Height was gauged using a portable height measurer to the nearest mm. Body Mass Index (BMI) was assessed from measured weight and height, and data were classified into four groups (underweight, normal weight, overweight and obese) based on the WHO classification (World Health Organisation, 1995).

Data Analysis

Data from questionnaires were entered twice with EpiData software version 2.1a (Laurenson et al., 2000). Their final quality was ensured by a check file associated with the data entry process and also by further data cleaning. The silhouettes were transformed so that the associated 31 items could be analysed as continuous variables on a scale of 1–6. To investigate the relationship between attitudes to body size and socioeconomic status (educational level, profession of woman, profession of head of household, possession of a car), age and BMI, differences in means were tested using the kruskal-wallis test. This test was appropriate to compare the Mean values of the two sets of data, as the data did not conform to a normal distribution. The

Table 2. Body sizes that women associate with good health, high social status and individual desirability



BMI	20	24	28	30	33	38		
BMI group	normal		overweight		obese			
Silhouette	1	2	3	4	5	6		
<i>Individual attributes</i>								
Warm :			▲				182	2.30 ± 1.3
Greedy :					▲		198	5.41 ± 1.2
Confident :	▲						190	2.20 ± 1.2
Feminine :			▲				191	2.51 ± 1.3
Happy :	▲						182	2.38 ± 1.5
Popular:					▲		187	3.98 ± 1.7
Friendly :			▲				185	3.41 ± 1.6
Calm :	▲						184	2.46 ± 1.4
Proud :			▲				188	2.60 ± 1.6
Sociable :			▲				171	2.91 ± 1.5
Large appetite :					▲		192	5.09 ± 1.3
Has willpower :	▲						181	2.43 ± 1.5
Strong personality :	▲						176	2.24 ± 1.4
<i>Social status aspects</i>								
Likely to marry :	▲						194	1.85 ± 0.8
Get a good job :	▲						170	2.00 ± 1.2
Have enough money:			▲				141	2.79 ± 1.7
Have a contented husband :	▲						171	2.25 ± 1.2
Have proud parent in-laws :	▲						165	2.45 ± 1.2
Have children :			▲				148	2.81 ± 1.4
<i>Health aspects</i>								
Be healthy :	▲						196	1.88 ± 0.9
Live a long life :	▲						147	1.78 ± 0.9
Eat healthily :	▲						195	1.86 ± 1.1
Have healthy children :	▲						170	2.31 ± 1.0
Develop heart disease :					▲		180	5.35 ± 1.2
Develop diabetes :					▲		187	5.43 ± 0.9
Develop cancer :			▲				125	4.17 ± 2.0

chi-squared test was used to test for differences between BMI group and socio-demographic factors. SPSS was used for descriptive analyses. Differences were considered statistically significant at the $p < 0.05$ level.

RESULTS

Subjects

All of the 203 randomly selected women agreed to participate and constitute the final sample. About one-third of women had received either no school education (12.8%) or only to primary school level (22.7%). Less than half the sample (46.8%) reported working outside the home (Table 3). Mean BMI was 26.1 kg/m² (Table 4), with half of women classified as either overweight (28.3%) or obese (21.9%). BMI increased significantly with age ($p < 0.001$; $\chi^2 = 39.3$). There was a relationship between BMI

Table 3. Socio-demographic characteristics of the sample (n = 203 women)

	%
<i>Educational level :</i>	
None	12.8
Primary (partial or full)	22.7
Secondary (partial or full)	25.6
Higher education	38.9
<i>Employment head of household :</i>	
High professional and professional (e.g. doctor)	42.4
Semi-skilled and unskilled (e.g. secretary)	49.8
Unemployed and retired	7.9
<i>Employment of interviewee :</i>	
High professional and professional	31.0
Semi-skilled and unskilled	14.8
Unemployed	40.9
Student	13.3
<i>Age (y):</i>	
18–29	35.5
30–39	28.1
40–52	36.5
<i>Car ownership:</i>	
Yes	27.1
No	72.9

Table 4. Anthropometric characteristics of Tunisian women (n = 203)

	Mean \pm s.d.	Range		
Weight (kg)	66.9 \pm 13.7	42.0–119.3		
Height (m)	1.60 \pm 0.07	1.45–1.83		
BMI (kg/m ²)	26.1 \pm 5.6	15.0–43.0		
BMI group	Whole sample %	18–29 yrs %	30–39 yrs %	40–52 yrs %
<18.5 (underweight)	2.7	6.0	2.0	0
18.5–24.9 (normal)	47.1	70.1	47.1	24.6
25–29.9 (overweight)	28.3	17.9	25.5	40.6
\geq 30.0 (obese)	21.9	6.0	25.5	34.8
\geq 25.0 (overweight/obese)	50.2	23.9	51.0	75.4

and education level ($p < 0.001$; $\chi^2 = 27.0$), as BMI was lower in higher educational groups, but no differences were found in the prevalence of obesity with other indicators of socio-economic status (woman's profession, head of household or possession of car), indicating that overweight and obesity pervade all groups in society.

Satisfaction with Current Body Size

More women were dissatisfied (62.1%) than satisfied (37.9%) with their CBS, with more of those dissatisfied preferring a lighter (47.3%) than a heavier (14.8%) IBS (Table 5). Only a few (9.9%) overweight/obese (BMI \geq 25) women wanted to gain more weight. There was a link between body satisfaction and BMI, as more than three-quarters (77.9%) of overweight and obese women wanted to have a slimmer silhouette. However, a quarter (25.0%) of women with a normal BMI (Table 5) wanted to gain more weight. Body satisfaction was associated with age ($p < 0.005$) and educational status ($p < 0.05$), as younger women were more satisfied compared with older women, who were more likely to state that they wanted to lose weight (Table 5). Women who wanted to lose weight had more negative body size perceptions for the obese and overweight silhouettes than those who wanted to gain weight for 9 of the items. They were less likely to report that obese/overweight silhouettes had a lot of willpower, were likely to marry, ate healthily, were in good health, had proud in-laws, had children, were sociable or proud ($p < 0.005$).

Table 5. Relationship between body satisfaction^a and BMI, age and education level (%)

	n	Would like to be heavier	Would like to be slimmer	Satisfied at present
Total sample	203	14.8	47.3	37.9
<i>BMI (kg/m²)^b</i>	182			
18.5–24.9		25.0	21.6	53.4
25.0–29.9		7.5	60.4	32.1
≥30		2.4	85.4	12.2
<i>Age group^c</i>	203			
18–29yrs		19.4	29.2	51.4
30–39yrs		15.8	49.1	35.1
40–52yrs		12.2	62.2	25.7
<i>Educational level^d</i>	203			
None		26.9	61.5	11.5
Primary (partial or full)		13.0	56.5	30.4
Secondary (partial or full)		17.3	44.2	38.5
Higher education		12.7	38.0	49.4

^abody satisfaction calculated as current body size (CBS) minus ideal body size (IBS) after Williamson et al., 2000. ^b $p < 0.001$; ^c $p < 0.005$; ^d $p < 0.05$.

Lay Understanding of Weight Definitions

For over three-quarters of women (79.3%), a 'normal' weight corresponded with the silhouettes categorised as normal in medical terms (Table 1). Respondents understood the notion of obesity, as almost all (97.1%) correctly chose the 'obese' silhouettes when describing obesity. Overweight was the most difficult category for women to define as only half of respondents correctly categorised overweight silhouettes as overweight in medical terms. These definitions were not influenced by age. They were, however, influenced by socioeconomic status and BMI. Women of higher socioeconomic status were most likely to choose slimmer body shapes to define normal and overweight silhouettes ($p < 0.05$). Overweight women chose slimmer body shapes to define obese women ($p < 0.05$) indicating that they saw obesity as something occurring at a lower BMI than slimmer women did.

Body Size and Social Status

A 'normal' body size (BMI 20–24) was seen as having the most social status, as more respondents associated them with having: 'a contented hus-

band,' a 'proud family,' as 'more likely to get married' and to have 'a good job' (Table 2). However overweight was also associated with social status, as more women associated overweight with 'having enough money' and 'having children.' Younger women had more of a preference for slimmer body sizes for only 1 item related to social status, as they were most likely to report that slimmer body sizes had a contented husband ($p < 0.05$). Women with higher educational level were most likely to associate slimmer body shapes with having 'proud family in-laws' ($p < 0.05$).

Body Size and Individual Attributes

A normal body size (BMI 20–24) was associated with the most positive personal attributes (Table 2), for all items, except being popular (associated with being obese/overweight) and friendly (most often associated with being overweight). The obese silhouettes were most often seen as greedy and having a large appetite. Surprisingly, there was no marked preference by younger women for slimmer body sizes, except younger women were more likely to see slimmer silhouettes as more sociable ($p < 0.05$). Women with higher educational level were most likely to choose slimmer body shapes for 5 items ($p < 0.05$): the silhouette the most 'greedy', 'feminine', 'happy', 'proud', and the one seen as most likely to have 'willpower.'

Body Size and Health

The obese silhouettes were selected as those most likely to develop heart disease, cancer, or diabetes (Table 2). Again, a normal body size (BMI 20–24) was preferred as the most likely to have children, to eat healthily and live a long life. These findings were reinforced by the questions used to assess knowledge (Table 6), which showed that over 80% of women correctly answered that obesity increases the risk of diabetes, hypertension and heart problems. Knowledge was poorer for the relationship between obesity and cancer, with only around 40% of women answering correctly that obesity increases the risk of developing bowel cancer. It appears that older women, who are more likely to be obese or overweight ($p < 0.001$) had better knowledge of some of the health consequences of obesity, i.e., that obesity increases the risk of breast cancer after the menopause ($p < 0.05$) and that obesity increases risk of developing bowel cancer ($p < 0.05$). Older women were also more likely to be aware of the link between obesity and hypertension ($p < 0.001$) and heart problems ($p < 0.05$).

Table 6. Knowledge of the health consequences of obesity (n = 203)

	% correct ^a	% incorrect	% unsure
Obesity increases the risk of developing diabetes	88.7	7.9	3.4
Obesity increases risk of breast cancer after the menopause	41.0	16.5	42.5
Obesity increases the risk of developing bowel cancer	39.3	13.4	47.3
Obesity increases risk of developing hypertension	88.2	2.5	9.4
Obesity can contribute to heart problems	81.8	7.4	10.8

^aThe % of correct responses reflects the % of women reporting that these answers were 'True'.

DISCUSSION

This study of Tunisian urban women investigated whether women were satisfied with their body size, exploring the body size that women associate with the highest social status and the most positive individual attributes; and lastly, investigated perceptions and knowledge of healthy body size and chronic disease risk. The study also investigated whether perception varies in different groups of society to see if there is a difference in attitudes in younger women and those of higher socioeconomic status.

Over half of women were dissatisfied with their current body size. There was a link between body satisfaction and BMI, as the majority of women wanting to lose weight were either overweight or obese and the majority of women who preferred to be heavier, had normal BMI. Lay definitions of normal weight did not differ substantially from health definitions, as three-quarters of the sample viewed the medical 'normal' category as normal. However, the fact that women correctly assess normal silhouettes is still in contrast with studies from developed countries (Crawford and Campbell, 1999), where women tend to see normal weight silhouettes as 'overweight'. Nevertheless, there appears to be a preference for slimmer body weights.

Formal educational level did not correspond to the level of health literacy in our sample. The older women in this study (40–52 years) were more likely to be obese or overweight and have less formal education, but they had better knowledge of some of the health consequences of obesity. This enhanced knowledge is probably because they have experienced obesity, either directly themselves or through others.

In general, a 'normal' weight (BMI 20–24) was seen in the most positive light by Tunisian women, although some positive attributes were associated with overweight silhouettes ('friendly' and 'popular'). Obesity was mostly seen as undesirable, associated with greediness and development of diabetes, cancer and heart disease. The finding that women associated obesity with chronic disease was not surprising, as the prevalence of obesity and associated chronic disease has been increasing for some time in Tunisia. This study appears to agree with others (Rasheed, 1998; Jackson et al., 2003) that in the Middle-East-North African region, slimness (a healthy medical weight) is now valued and associated with a positive health and individual characteristics, with better educated women in particular having a preference for slimmer silhouettes. Plumpness or overweight was still valued by some, and by many it was associated with being popular and friendly, and was not associated with a health risk. However, the study's findings suggest a preference of urban Tunisian women for a normal healthy weight. It is difficult to ascertain if this preference is related to a growing influence of western culture in Tunisian society, but the social norm does appear to have shifted away from that traditionally held of plumpness. This may reflect the pattern seen in developed countries that obesity and overweight are revered when they are rare and are in a context of food scarcity (as a display of wealth); but that once societies become richer and therefore obesity and overweight become more prevalent, as is the case in Tunisia (Bouguerra et al., 2007), then plumpness begins to lose its desirability (Brown and Konner, 1987).

Previous studies (Paquette and Raine, 2004) have shown that there are opportunities to change women's body image, as perceptions are not static and relatively sensitive to change. The study's findings will help inform health promotion programmes in Tunisia that they need to focus on promoting a healthy weight and preventing a slide into a preference for underweight body sizes, as has been seen in many developed countries.

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