

Research Article

Body Mass Index in Clinic Attenders: Patient Self-Perception versus Actual Measurements

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Objectives. The objectives of the study were to measure actual BMI in patients attending chronic disease clinics in health centres and to relate this to the patients' own perceptions of their body image and the need to lose weight. **Study Design.** A cross sectional study. **Methods.** The actual BMIs in patients who attended chronic disease clinics in 14 health centres were measured. All participants were asked to state where they thought they were on a visual body image scale and were also asked if they thought they needed to lose weight. **Results.** All participants approached agreed to participate (RR 100%). 70% of patients were found to have a raised BMI. Approximately 73% of patients using the visual scale indicated that an overweight or obese BMI was ideal for them. **Conclusions.** Patients think they are thinner than they actually are, with obvious implications for health and health seeking behaviour. A whole of society approach is needed to change weight status perceptions and improve exercise and dietary behaviour.

1. Introduction

According to the World Health Organization, obesity has reached epidemic proportions globally, with more than 1 billion adults overweight and at least 300 million classified as clinically obese [1]. Obesity has been identified as the main contributor to the major causes of death [2, 3] and therefore presents an important global public health problem. Haslam and James in 2005 [4] reported that excess bodyweight is the sixth most important risk factor contributing to the overall burden of disease worldwide and that 1.1 billion adults and 10% of children were classified as overweight or obese.

In 2010, overweight and obesity accounted for 3.4 million deaths, 3.9% of years of life lost, and 3.8% of disability-adjusted life-years (DALYs) worldwide [5].

Obesity is associated with medical conditions such as diabetes, cardiovascular disease, pulmonary disease, metabolic syndrome, and obstructive sleep apnea. Obesity is being observed more frequently in orthopaedic patients. Orthopaedic patients with obesity-related comorbidities require specific preoperative and postoperative measures to improve their surgical outcomes. Furthermore, patients who

are obese are at risk for increased perioperative complications [6].

Obesity impacts not only on the sufferers in terms of associated health effects but also on their families and society as a whole. The health effects associated with obesity result in healthcare costs to the state and costs in terms of the drop in productivity both at school and at work [7].

In two decades there has been a 400% increase in obesity in the Caribbean. The prevalence of obesity in Trinidad and Tobago, the setting of this study, is 16.8%, similar to that of neighbouring Caribbean countries, with a greater proportion of females (21.8%) obese compared to males (10.7%). Trinidad and Tobago ranked twentieth in a global study with a prevalence of overweight and obesity at 67.9% [8] with more than 25% of children aged between 5 and 18 years, obese [9].

The UK Health Secretary called for collective international action to tackle lifestyle related diseases. He stated "that we face new challenges from obesity.... These are inextricably linked to the way we live our lives. They are just as widespread, just as chronic and increasingly threaten early mortality and disability. We need a bold and determined

‘whole government’ approach looking at better outcomes and helping individuals to make better choices about their own health. With an emphasis on prevention, on physical activity, on personal and corporate responsibility and with unified government action, we can make a big difference” [10].

The body mass index (BMI) is a simple measurement of the ratio of weight (in kilograms) and height (metres squared) and is used in clinical medicine to categorise persons into overweight (BMI 25–29.9 kg/m²) and obese (BMI > 30 kg/m²). However, the influence on a person’s BMI is multifactorial which includes genetic factors, behavioural and sociocultural factors, and economic and physical environments [11].

Given the list of contributory factors, it may seem obvious where to direct efforts to control BMI in the population but a lack of success stories in the literature suggests the solution may not be a simple one. Similar to other public health researchers, we decided to study BMI in patients. We decided to study self-perception of body image in patients and compare this to their actual measured BMI to determine if this would reveal areas for targeted interventions.

The aim of the study was therefore to record actual BMI in chronic disease clinic attenders and to ascertain individual patients’ perceptions of their own body image in relation to their actual measured BMI.

2. Methods

Ethical approval was obtained from the University of the West Indies and from the South West Regional Health Authority where this work was carried out.

A cross-sectional study design was used. The study population comprised patients who attended the chronic disease clinics in the 14 health centres in a county in south Trinidad.

We used an estimate of the prevalence of obesity among Trinidadians at 60%. In order to be 95% confident of the results with a margin of error of 10%, we estimated our required sample size to be 150 participants.

Informed consent was obtained from all participants. Weight (kg) and height (m) were measured on all patients using a regularly calibrated SECA scale. The same scale was transported by one of the authors to all 14 clinics to measure the heights and weights of the patients. The same author performed all measurements. The BMI was calculated for all patients.

An interviewer administered questionnaire was used to obtain information on demographic characteristics and on patients’ views about whether they thought they needed to lose weight and their perceptions of their body image using a pictorial representation of BMI, the Stunkard Scale. The questionnaire was pretested for face validity. The Stunkard Scale has 9 silhouette figures that increase in size from very thin (value = 1) to very obese (value = 9) [12].

Using the actual BMI of patients, patients were categorized into underweight, normal weight, overweight, and obese. Patients were asked if in their current state they thought they needed to lose weight. Patients were also asked

TABLE 1: Patients perceptions on whether they need to lose weight in relation to their actual BMI.

Patient BMI	Need to lose—yes	Need to lose weight—no	Total
Underweight	0	1 (100%)	1
Normal weight	15 (34.0%)	29 (65.9%)	44
Overweight	32 (53.3%)	28 (46.6%)	60
Obese	39 (86.6%)	5 (11.1%)*	44
Total	86	63	149

Fisher’s exact test P value < 0.001.

$N = 149$ as complete data * not available on 1 patient.

to view the body images on the pictorial scale and identify which body image they thought correctly identified their present body image.

Patients were also asked to identify which body image on the scale they thought represented the normal/ideal body image for them.

Results from the questions posed to patients were tabulated against their actual BMIs. Statistical Analysis Software (SPSS, version 10) was used to perform descriptive analyses of data via frequency counts of responses and cross tabulations. Chi-squared tests were used to evaluate the significance of differences between response groups. In the cases where the chi-squared test was not reliable, we used the nonparametric Fisher’s exact test. The P values for these tests were denoted by P and $P < 0.05$ was considered statistically significant.

3. Results

One hundred and fifty patients ($N = 150$) were invited to participate in the study and all agreed to participate leading to a response rate of 100%. The majority of patients (51.3%) were in the 41–60-year age group with females (74%) and Trinidadians of East Indian origin (73%) predominating.

All patients were asked if they thought they needed to lose weight. Table 1 shows the responses to this question tabulated against the actual BMI of the patient. Almost half of those who were measured to be overweight did not think they needed to lose weight, while 87% of those who were found to be obese said they needed to lose weight. Almost one-third of those who were found to have a normal BMI thought they needed to lose weight. Patients’ perceptions on whether they need to lose weight and their actual BMI were significant ($P < 0.001$).

One hundred and five (70%) patients were measured as having a raised BMI (BMI > 25). Of the 60 patients who were overweight, 42 (70%) thought they were slightly overweight according to the visual scale. Of the 45 patients who were obese, 30 (67%) thought they were slightly overweight according to the visual scale. 71 out of 105 (67%) patients with a raised BMI thought they needed to lose weight.

Patients were asked to view the pictorial body images and identify which body image best matched their present shape. Table 2 shows that 85% of patients reported that they were at least overweight.

TABLE 2: Patients' perceptions of their body image using a visual scale.

Visual scale category	Patient number (%)
Underweight	7 (4.7)
Normal	16 (10.7)
Overweight	92 (61.3)
Obese	35 (23.3)
Total	150 (100)

TABLE 3: Patients perceptions on which body image was normal for them.

Visual scale category	Patient number (%)
Underweight	14 (9.3)
Normal	26 (17.3)
Overweight	63 (42.0)
Obese	47 (31.3)
Total	150 (100)

TABLE 4: Patients' perceptions on whether they need to lose weight according to where they see themselves on the visual scale.

Patients view on whether they need to lose weight	Patients view on whether they need to lose weight			
	Underweight	Normal	Overweight	Obese
Yes	0	3	62	21
No	7	13	29	14
	7	16	91	35

Fisher's exact test P value < 0.001.

Patients were asked which body image was normal/ideal for them. Table 3 shows that 73% of patients identified body images that were at least overweight as ideal for them.

Patients were asked if they thought they needed to lose weight. These results were tabulated against the categories they put themselves into by viewing the visual scale (Table 4). Approximately one-third who categorised themselves as overweight and obese said they did not need to lose weight despite choosing the overweight and obese category for themselves on the visual body image scale. Patients' perceptions on whether they need to lose weight according to where they see themselves on the visual scale and their actual weight were associated ($P < 0.001$).

Approximately 30% of those who chose the overweight and obese categories as ideal for them said they did not need to lose weight; 64% said they needed to lose weight despite choosing that body image as ideal for themselves. Table 5 illustrates the findings. Patients perceptions on whether they need to lose weight according to where they think is normal for them on the visual scale are not associated (P value > 0.05).

Of 16 patients who thought a normal BMI body shape was where they were on the visual scale, 3 (19%) thought an overweight image was ideal for them. Of 91 who saw themselves as overweight on the visual scale, 37 (41%) thought overweight was normal/ideal for them while 39 (43%) thought obese was ideal for them.

TABLE 5: Patients' perceptions on whether they need to lose weight according to where they think is normal for them on the visual scale.

Patients view on whether they need to lose weight	Patients view on whether they need to lose weight			
	Underweight	Normal	Overweight	Obese
Yes	5	11	39	31
No	9	15	24	15
	14	26	63	46

Chi-square test statistic = 7.524, $df = 3$, P value = 0.057.

In Table 6, where patients think they are on the visual scale is compared to what they think is normal for them on the visual scale. There is a significant association between these two variables (P value < 0.001).

4. Discussion

4.1. Main Findings. In patients who attend chronic disease clinics, 70% of patients sampled were found to have a raised BMI. Approximately 73.3% of patients, using the visual image scale [12], indicated that an overweight or obese BMI was ideal for them, while 85% said an overweight or obese body image was where they were presently at. Of 45 patients found to be obese on measurement, 30 (67%) thought they were slightly overweight. Furthermore 23 patients who saw themselves as obese thought overweight was normal for them; of concern is that 37 (41%) who were overweight thought this was normal for them and 39 (43%) who were overweight thought the obese image was normal for them. This is an important finding as self-perception and recognition of the problem has been reported to lead to weight loss attempts [13].

Approximately one-third of patients said they did not need to lose weight despite choosing the overweight and obese category for themselves on the visual body image scale.

In this study, there appears to be a misperception about what a healthy BMI should be and perhaps share the view that "men prefer women a little fat," for example [14]. Obesity has been associated with wealth and prosperity in men and health and reproductive abilities for women [15].

Addressing the challenge of overweight and obesity requires a multifaceted approach as there are several influencing factors. How patients perceive the weight of healthcare providers who give weight loss advice has also been shown to influence whether healthcare advice is accepted [16, 17].

Furthermore, health education messages are not effective when given to individuals who are not at the right stage for behaviour change [18].

4.2. What Is Already Known on This Topic? Obesity is a problem of developed and developing nations and is increasing. Traditionally overweight was associated with being healthy and wealthy. Ethnic variations in childhood obesity prevalence exist [19]. South Asian Americans underestimated their weight and had little knowledge of the link between their weight and the risk of chronic diseases [20]. Misperceptions

TABLE 6: Patients perception of where they are on the visual scale and what is normal for them on the visual scale.

Where patients think they are on visual scale	What patients think is normal for them on visual scale			
	Underweight	Normal	Overweight	Obese
Underweight	7	0	0	0
Normal	1	12	3	0
Overweight	4	11	37	39

Fisher's exact test P value < 0.001.

were also found in black and Hispanic female adolescents who underperceived their weight status [21]. A study revealed that female sex and older age group were associated with the thought that “men prefer women a little fat” [14].

4.3. What This Study Adds? This study adds that how patients identify themselves on a visual body image scale differs in relation to their actual measured BMI. In some instances what they think is normal for them is also outside of a healthy body image range. These findings strongly indicate that work is needed in the area of informing the public and patients about what is considered to be a healthy body shape and size and to inform them about the potential adverse effects of overweight and obesity. This is important given the association of central obesity with insulin resistance and the development of Type 2 diabetes mellitus and increased cardiovascular risk, common in persons of South Asian origin [22].

5. Conclusions

The majority of patients in this study were at least overweight. Some patients who were at least overweight did not think they needed to lose weight. In addition, there were differences in patient perceptions about body image compared to actual measured BMIs. As there is little doubt about the negative effects of overweight and obesity on health and that exercise and diet have a positive effect on obesity-related cardiovascular risk factors and cancers, the question of how to motivate persons to improve exercise and dietary habits arises. However this study strongly reveals that before motivating persons to increase exercise and improve their diet, patients need self-awareness that they are indeed overweight and obese with potentially serious implications for their health and well-being. This work suggests a role for health educators and promoters. Cultural factors can play a role in terms of body image perceptions and ethnicity [20, 23] and these factors need to be taken into account when targeting certain groups. The link with ethnicity has not been shown to be associated with deprivation but Asian and black school aged children in the UK have been shown to have more obesogenic lifestyles than their white counterparts [24].

Ng et al. state that national success stories addressing obesity have not been reported in the last 33 years and the prevalence of obesity continues to rise [5]. The whole of society approach is important [25] as governments need to make the living and working environments compatible with the health education messages being disseminated; citizens

need to be able to access health information, healthy food items, and environments that are conducive to exercise.

Limitations of Methodology

The prevalence used to calculate the sample size was chosen as 60%. This is an estimate and will not be representative of the prevalence within the county (or country). The study was limited to one county in Trinidad and Tobago. Although the majority of patients were of East Indian ethnicity, this reflects the ethnic distribution of the county with a higher proportion of Indo-Trinidadians. Despite being limited to one county, most findings were significant. We do not make any claim that these results can be extended to the entire county and/or population of patients. However, the study presents results that may be used in designing a more comprehensive study. To date, no study has been done using comparisons of actual obesity measures using BMI and self-rating scales.

Ethical Approval

Ethical approval was obtained from the UWI Ethics Committee and the South West Regional Health Authority Ethics Committee.

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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