BODY MASS INDEX AND SELF PERCEPTIONS OF WEIGHT STATUS AMONG OUTPATIENTS ATTENDING HOSPITAL   HEALTH FACILITIES IN DAR ES SALAAM

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ABSTRACT

Background: Overweight/obesity is on the rise in developing countries, especially in urban areas. Although overweight/obesity is one of the leading preventable causes of death less is known about the prevalence of obesity and the perceptions about weight among patients attending healthcare facilities. Previous studies have shown that correct perception of body weight is an important factor in weight control. This study determined prevalence of overweight/obesity and assessed perception scores about body weight among patients attending healthcare facilities in Dar es Salaam, Tanzania.

Methods: In this study, a cross- sectional study was conducted in three district government hospitals in Dar es Salaam. A structured questionnaire was used to collect data on socio demographic characteristics and perception about body weight, Height and weight were measured following standard procedures. Chi-square tests and logistic regressions were used to determine the prevalence and demographic factors which influence perceptions about body weight. A total of 410 outpatients aged 18-59 years were randomly recruited into the study.

Results: The prevalence of overweight and obesity among patients was 25.8% and 23.9%, respectively. This was higher among women compared to men (33% versus 14%). (P=0.02). Despite this higher prevalence, Majority of patients tended to underestimate their weight, (50.6%) considered their overweight as normal weight, (66.2%) perceived their obese status as normal. In total, only 41.2% of patients accurately classified their weight. Logistic regression analysis showed that Education level, (AOR=O.18. 95% CI 0.09-0.34), occupation (AOR=1.96 95% CI 0.86-4.50), and nutritional status (AOR=9.19, 95% CI 4.34-19.48), were significant predictors of correct perception of one's body weight.

Conclusions : The prevalence of overweight and obesity is high in this population. However, more than half of overweight and obese outpatients had incorrect perception of their body weights. We recommend health facilities increase awareness of weight status and promote a healthy body weight. Increasing patient's awareness of their overweight problems is the first step in preventing diet related NCDs.

Key words: Outpatients, body mass index, self-perceptions, Non communicable diseases.

INTRODUCTION

Obesity is known to contribute, directly or indirectly, to the development of long-term complications of type 2 diabetes mellitus (T2DM) and hypertension. Obesity has been identified as a growing problem in Tanzania as well as many developed and developing countries (1). According to World Health Organization (1), the burden of obesity has doubled in the past two decades and that by the end of 2008, there were 1.5 billion overweight adults aged 20 years and above. Rates of obesity have tripled in developing countries over the last 20 years, where the prevalence of overweight adults is in the range of 10 to 25%, and the prevalence of obesity ranges from 2 to 10% (2)..

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Rates of obesity have tripled in developing countries over the last 20 years, where the prevalence of overweight adults is in the range of 10 to 25%, and the prevalence of obesity ranges from 2 to 10% (2). It is currently estimated that as much as 20-50% of urban populations in Africa are classified as either overweight or obese (3), and that by 2025 three quarters of the obese population worldwide will be in non-industrialized countries (1). The recent estimates show that the prevalence of obesity is 13% and 36% among urban men and women, respectively (4).

Health care facility is the most common setting for the provision of health care assessment and advice. Healthcare providers are well placed to use every patient contact as an opportunity for assessing and advising them. Despite an increasing prevalence of obesity (5), it is not known to what extent self perception of the body weight does affect the level of obesity/overweight as risk factors for NCDs.

Knowing the prevalence is important for determining the size of the population that may benefit from strategies to reduce hypertension and overweight/obesity while controlling blood glucose. Although overweight/obesity is one of the leading preventable causes of death less is known about the prevalence of obesity and the perceptions about weight among patients attending healthcare facilities. The perception about body weight is influenced by several factors including culture and ethnicity (6). In developed countries, a thin body is an ideal and preferred among females (7). In developing countries, heavier body is the preferred although there is a shift towards a thin body (8). Women have been reported to have higher false perception of their body weight compared to men (9). Other numerous surveys have also shown that women are generally dissatisfied with their bodies in comparison to men (10).

The awareness on healthful dietary behavior can play a role in preventing or managing NCD diseases especially when people are aware of their weight status. The importance of this emerging trend is the connection between obesity, type 2 diabetes, hyperlipidemia, and hypertension (11). Given the risk of development of severe health consequences and the heavy burden on the health care system, effective prevention targeting those at risk is the key to combating this health problem.

Making majority of outpatients aware that obesity is a health problem might be the first step in promoting a healthy lifestyle and a healthy body weight. Although there is no direct evidence that increasing person's awareness of weight problems would prevent overweight and obesity, there is evidence that people's awareness and monitoring of weight status can prevent risky behavior. Likewise person who does not recognize weight problems is less likely to take steps to change their unhealthy lifestyles and to prevent obesity.

Because an appropriate perception of one's own weight is important for improved weight control behavior, understanding people's perception of obesity will help in designing educational programs to address obesity and other related chronic diseases in Tanzania. We assessed prevalence of overweight and obesity and the perception of body weight among adult patients attending healthcare facilities in Dar es Salaam.

METHODS
Study Design, Population, and Sampling Methods

Dar es Salaam is the lagest city and commecial centre in Tanzania. The total surface area of the city is 1,397 square kilometers which is equivalent to 0.15 percent of the entire Tanzania Mainland area. According to the 2012 national census, the region had a population of 4,364,541. For 2002-2012, the region's 5.6 percent average annual population growth rate was the highest in the country. The Health sector in the Region provides curative, preventive, rehabilitative and promotive health care in Hospitals, Health Centres, Dispensaries and Mobile health Services. The Region has 449 health facilities of which 28 are hospitals, 29 health centers and 392 are dispensaries. Public/government hospitals are Muhimbili National Hospital, Ocean Road Hospital, and three district hospitals namely Mwananyamala, Amana and Temeke Hospitals.

This cross-sectional study was conducted among outpatients aged 18-59 years randomly recruited from three districts hospitals of Ilala, Kinondoni and Temeke in Dar es Salaam City, Tanzania. Patients were not included if they were attending NCDs clinic at the time of this study. This was because they may have been given special advices and care in addition for curative purposes. Pregnant women and women until 6 months following child birth were excluded because of their physiological changes and lastly very sick persons were also excluded.

The study employed systematic sampling method with a sampling interval of three that was based on average number of patients per day from the most recent past week. They were approached when leaving consultation rooms after health care services from their Doctors. Every third patient coming from doctor's consultation room who consented was interviewed until the sample size was attained. (12). The aim was to get at least 410 respondents.

Anthropometric Measurements

Using an interview questionnaire, data on their age, gender, education level, marital status and occupation was collected. Anthropometric measurements were conducted by a trained nutritionist and one study nurse. Body weight was measured with subject standing and wearing light clothes and without shoes to the nearest 0.1 kg using a digital scale (Seca, Tokyo, Japan). Height was measured to the nearest 0.5 cm using a portable stadiometer. Body-mass index (BMI) was calculated for each participant by

dividing body weight in kilogram by square of height in meters and categorized as underweight (<18.5,) normal (18.5 to = or<25.0), overweight (25.0 – <30.0), and obese (≥30.0), (13).

Perception about body weight

Perception about weight was determined by asking the study participants that: *How do you perceive your current weight,* then required to respond in a scale of the options *1)* underweight 2) normal weight, *3)* overweight *4*) obese. (14) We then compared the responses with the categorized BMI. Independent variables considered include age group, body mass index (BMI), sex, marital status, educational level, and occupation. The outcomes of interest in this study were self perception of body weight. The researchers supervised data collection daily by checking all questionnaires for any errors.

Data analysis

Statistical analysis software (SPSS 16) was used for data analysis. The general characteristics of the study population were described using descriptive statistics such as means, standard deviations. Difference in the prevalence of overweight and obesity by gender was assessed using chi-square ($\chi2$) test. In all the analyses, $P \leq 0.05$ was considered statistically significant. Logistic regression analysis was done to determine the influence of demographic characteristics of patients' ability to accurately identify whether the perception was based on other demographic characteristics (sex, age group, marital status, occupation, nutritional status and education level). We report Odds Ratios and 95% CI interval. All demographic characteristic which were statistically significant at a p-value of 0.2 or less in descriptive analysis were included as potential confounders in multivariate models.

The study was approved by ethical review committee of the Muhimbili University of Health and Allied Health Sciences (MUHAS) and an informed consent was obtained from all participants prior to the study.

RESULTS
Characteristics of the sample

A total of 410 participants 251(61.2%) female and 159 (38.8%) male aged 18 to 59 years, were included in this analysis. Participants were attended at the three districts hospital in Dar es salaam city of which 136 were from Amana, 137 from Temeke, and 137 from Mwananyamala hospitals. The socio-

demographic characteristics of participants are summarized in Table 1. The mean age of the patient was 37.78 (SD=11.6) years. Majority 163 (39.7%) of patients reported to be aged between 50 to 59 years. The numbers of women were significantly higher than male, female patients were 251 (61.2%). Married participants were of highest proportion 249 (60.9%) whereas the least were post married 56 (13.7%). Thirty four percent of enrolled patients were in privately employed sector with a further one fifth identifying as civil servant. Around 15.6% were unemployed and 23.9% reported to be doing business. About three quarter of participants had received either no school education 75.6% (n=310) or only primary school level education .24.4% (n=100) less than a quarter of respondents completed secondary school education, that is evenly spread throughout males and females. There were significant more young males than female as well as more older female than male. Statistically significant difference was observed for age group (p=0.02), nutritional status (p=0.02). The observed difference in proportion seems not to be statistically significant for education, occupation, and marital status. The overall prevalence of overweight and obesity among patients as determined by BMI was 25.8% and 23.9%, respectively. The prevalence of overweight was higher among women compared to men (33% versus 14%). This gender difference was statistically significant (P =0.02).

Patients' perception about body weight in relation to demographic characteristics is presented in Table 2. Only one hundred and sixty seven participants (41.2%) perceived their body weight correctly while majority two hundred and forty three (58.8%) perceived their body weight incorrect. There were differences in perception about body weight among difference demographic characteristics. Patients with higher education level were perceived their body weight more correct (72.0%) as compared to patient with lower education level. The observed difference was found to be statistically significant (P=0.00).
Civil servant group had highest proportion of correct perceptions 65 (60.2%) of their body weight as compared to other occupation groups. The observed difference was statistically significant (P=0.00). Patients who were obese perceived their body weight more incorrect 69 (85.2%) as compared to patient with other nutritional status categories. The observed difference was found to be statistically significant (P=0.00).

Table 3 shows that patients' actual weight categories were different from their perceptions.

Table 1: Demographic characteristics of a sample population by sex

Characteristic	SEX		Total	P value
	Males	Females	All	
	N (%)	N (%)	N (%)	
	N=159(38.8)	N=251(61.2)	N=410(100)	
Age group				
<29yrs	23 (14.5)	15 (5.8)	38 (9.3)	
30-39yrs	20 (12.6)	44 (17.6)	64 (15.6)	
40-49yrs	56 (35.2)	89 (35.5)	145 (35.4)	0.02
50-59yrs	60 (37.7)	103 (41.1)	163 (39.7)	
Marital status				
Single	40(25.1)	65(25.9)	105 (25.6)	
Married/cohabitating	91(57.2)	158(62.9)	249 (60.7)	0.17
Post married	28(17.6)	28(11.2)	56 (13.7)	
Education levels				
Completed primary school and below	125 (78.6)	185 (73.7)	310 (75.6)	
				0.15
Completed secondary school and above	34 (21.4)	66 (26.3)	100 (24.4)	
Occupation				
Privately employed	54 (33.9)	86 (34.3)	140 (34.1)	
Civil servant	40 (25.1)	68 (27.1)	108 (26.3)	0.92
Business	38 (23.8)	60 (23.9)	98 (23.9)	
Not employed	27 (16.9)	37 (14.7)	64 (15.6)	
Nutritional status				
Underweight	8(5.0)	12 (4.8)	20 (4.9)	
Normal	87(54.7)	99 (39.4)	186 (45.4)	0.02
Overweight	23(14.5)	83 (33.1)	106 (25.8)	
Obese	41(25.8)	57(22.7)	98 (23.9)	

Self-perception of weight compared with the calculated BMI

Patients tended to underestimate or overestimate their weights. The table shows that 6.3% of patients were underweight and only 11. 5% had correct perception of their weight, while just over half (54.1%) of the patients had normal weight and less than half (41.4) had correct perception. One fifth (21.2%) of the patients were overweight and only a quarter (26.4%) had correct perception. Less than one fifth (18.0%) were obese and only 6.8 had correct perception and actually two thirds (66.2%) perceived their obesity as normal weight.

Figure 1. Shows that patients actual BMI compared to their perceptions. The figure shows that, when actual weight are compared to patient's perceptions they are different and in this case normal weighted patient had relatively higher correct perception followed by overweight, underweight and lastly obese.

Table 4: presents factors predicting correct perception of one's body weight. The table shows that, correct perception of one's body weight was significantly associated with demographic characteristics. Male patients were more likely to have correct perceptions of their body weight than females (AOR = 1.33, 95% CI = 0.83-2.14). Patients who are completed secondary education and above were more likely to have correct perceptions of their body weight than those who had lower education level (AOR 0.18, 95% CI=0.09-0.34). The patients

who were had overweight and obese status had decreased ability to recognize their weight status than those with normal weight, (AOR = 9.50, 95% CI = 4.49-20.10), and (AOR = 3.79, 95% CI = 1.63-8.85), respectively. Likewise patients who were civil servant were more likely to have increased ability to perceive their weight status correctly than those from other occupation groups. (AOR = 1.96, 95% CI = 0.86-4.50),

Table 2: Perception about body weight in relation to demographic characteristics

Characteristic	Perception		Total	P value
	Correct N (%)	**Incorrect** N (%)	**Total** N (%)	
	N=169(41.2)	**N=241(58.8)**	**N=410 (100 %)**	
Sex				
Male	71 (44.6)	88 (55.34)	159 (38.8)	
Female	96 (38.2)	155 (61.75)	251 (61.2)	0.19
Age group				
<29yrs	14 (36.8)	25 (65.7)	38 (9.3)	
30-39yrs	27 (42.2)	36 (56.2)	64 (15.6)	
40-49yrs	59 (40.7)	86 (59.3)	145 (35.4)	
50-59yrs	67 (41.1)	96 (58.9)	163 (39.7)	0.91
Marital status				
Single	47 (44.7)	58 (55.2)	105 (25.6)	
Married/cohabitating	97 (38.9)	152 (61.1)	249 (60.7)	
Post married	23 (41.1)	33 (58.9)	56 (13.7)	0.59
Education levels				
Completed primary school and below	95 (30.6)	215 (69.4)	310 (75.6)	
				0.00
Completed secondary school and above	72 (72.0)	28 (28.0)	100 (24.4)	
Occupation				
Privately employed	44 (31.4)	96 (68.6)	140(34.2)	
Civil servant	65 (60.2)	43 (39.8)	108(26.3)	
Business	40 (40.8)	58 (59.2)	98(23.9)	0.00
Not employed	18 (28.1)	46 (71.8)	64(15.6)	
Nutritional status				
Underweight	5 (2.7)	18 (78.3)	23 (4.9)	
Normal	121 (53.8)	104 (46.2)	186 (45.4)	
Overweight	29 (35.8)	52 (64.2)	106 (25.8)	0.00
Obese	12 (14.8)	69 (85.2)	98 (23.9)	

Table 3: Patient perceived body weight in comparison to the actual body weight as indicated by BMI.

Actual BMI level		Perceived body weight			
BMI category	Actual nutrition status. N=410 (%)	Underweight N=39 (%)	Normal N=193 (%)	Overweight N=143(%)	Obesity N=35 (%)
Underweight	26 (6.3)	3 (11.5)	15 (57.7)	8 (30.8)	0 (0.00)
Normal	222 (54.1)	31 (14.0)	92 (41.4)	86 (38.7)	13 (5.9)
Overweight	87(21.2)	3 (3.4)	44 (50.6)	23 (26.4)	17 (19.5)
Obese	74 (18.0)	2 (2.7)	49 (66.2)	19 (25.7)	5 (6.8)

Discussion

In this study we found statistically significant differences in the prevalence of overweight and obesity among male and female. There were also differences in the perceived and actual body weights among participants with different nutritional status. Overall, overweight and obese people tended to underestimate their body weight. Despite a higher prevalence of overweight and obesity in this study, there was a tendency towards underestimation of body weight, where more than half of overweight and obese outpatients perceived their weight as normal or underweight.

Table 4: Factors predicting correct perception of one's body weight

Variable	N	UOR(95%CI)	AOR(95%CI)
Sex			
Male	159	1.30 (0.87-1.95)	1.33 (0.83-2.14)
Female	251	Reference	Reference
Education level			
Completed primary school and below	310	0.17 (0.10-0.28)	0.18 (0.09-0.34)
Completed secondary school and above	100	Reference	Reference
Occupation			
Privately employed	140	1.17 (0.61-2.20)	1.15 (0.57-2.30)
Civil servant	108	3.86 (1.98-7.50)	1.96 (0.86-4.50)
Business	98	1.76 (0.86-3.40)	1.64 (0.78-3.47)
Not employed	64	Reference	Reference
BMI category (kg/m^2)			
<18.5	38	Reference	Reference
18.5 – <25	64	1.59 (0.50-5.12)	1.87 (0.23-6.72)
25-<30	145	6.69 (3.43-13.03)	9.50 (4.49-20.10)
30+	163	3.21 (1.49-6.88)	3.79 (1.63-8.85)

Overweight and obese men underestimated their body weight more than male. Underweight outpatients on the other hand tend to overestimate their body weight. Our findings are similar to those from other studies which have also reported underestimation of true body weight and is more common among overweight/obese individual (15,16,17).
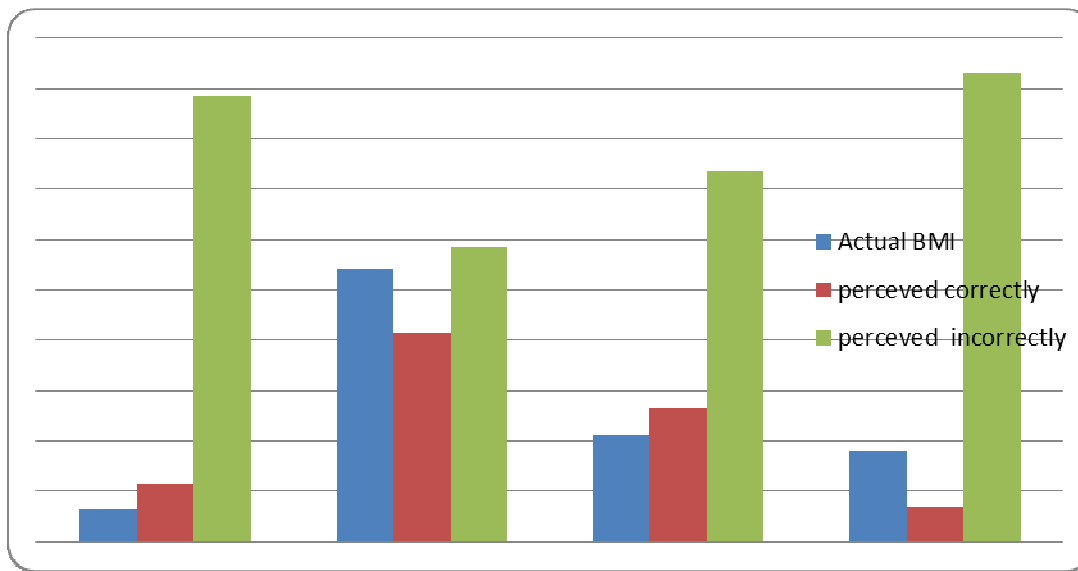
Figure 1: Patients actual measured BMI and self-perceptions of weight categories

Underestimation of one's own weight is associated with increased risk of becoming overweight because they are more likely to attempt to gain weight (18, 19, 20).We observed that significant proportion of individuals in the overweight and obese categories inaccurately classified their weight status. Appropriate perception of weight was strongly associated with weight loss efforts across genders and BMI categories (21). Underestimation of weight status may contribute to denial of current weight thus being a health risk and thus contributes to increase in health problems associated with obesity (6). Another study in Seychelles was done among persons with excess weight, where 63.5% of overweight males, 45.1% of overweight females, 23.6% of obese males, and 17.2% of obese females did not perceive their weight as being high (20). In this study, majority of obese and overweight participants underestimated their weight. A study from an urban community in Dar es salaam had shown similar proportion of misperception of obesity among participants (21). The study done in Australia reported half of men and one quarter of women did not consider themselves to be overweight/obese (22). Another study in Australia also reported 66% of obese and 34% of overweight participants failing to recognize their correct weight status (23). Similar findings have been reported from Spanish adults (24). Similar trends have been observed in other studies where female were more likely to misperceive their weight status, (25). Possible reasons may be that, female are more

concerned about their body image than male, which may alter their perception of weight. It may also be related to the increased prevalence of overweight and obesity in female, which is usually accepted as gender related. (26). This is a cause of concern because accumulation of adipose fat as risk factors can increase the likelihood of chronic diseases.

Study limitations
Despite its cross-sectional design which does not allow drawing inference on the direction of the association, the strengths of our study include its hospital-based design, in hospital people may feel more comfortable when they are asked about their health. We also used the actually measured weights and heights. Other studies have assessed perception about body weight by relying on self-reported values of weights and heights, which can also be over or underestimated.

 Conclusions
Results from this study can be considered as an early warning that overweight and obesity, as a risk factor for NCDs is on the increase among patients attending healthcare facilities. The results also warned that majority of overweight and obese individuals do not consider themselves as having excess weight. So if there is no prepared preventive interventions considered in the near future, obesity among urban women and men might be higher than observed in this study. We observed marked difference between

the actual and perceived weight. Proper perception of one's actual weight is critical for individuals to be receptive to healthy life style and health messages about weight maintenance or weight loss goals. It is evident from our findings that health education and other interventions are needed to address issues related to consequences of excess body weight. Therefore if routine assessment of nutrition status is employed during healthcare visit, then visiting healthcare facility can be an opportunity in assessing and informing people about their health risk so that they may realize the health status and risks associated with excess body weight. Education about healthy weights and prevention of weight gain will be important steps towards addressing the issue of obesity in healthcare facilities.

Acknowledgement

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