

Full Length Research Paper

Underweight, overweight and obesity amongst young adults in Ota, Nigeria

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The pattern of body weight abnormality amongst persons in their early adulthood in Ota, Southwest Nigeria was investigated. A total of 341 healthy young adults (194 male; 147 female), aged 20 – 35 years participated in the study. Anthropometric measurements and WHO cut-offs were used to categorize their body weights into normal weight, underweight, overweight and obesity. Males were significantly ($p < 0.05$) bigger in size (weight and height) than females. Body weight abnormality was higher in females (36.0%) than males (23.7%). Underweight was prevalent (12.9%) amongst females but low (2.6%) in males; 2.7% of females were severely underweight. The most prevalent abnormality was overweight (19.7% in females; 18.6% in males) whereas obesity was the least (3.4% in females; 2.6% in males). Gender differences appear to influence the body weights of the young adults in Ota, Nigeria. The study suggests a dual challenge of malnutrition and over-nutrition amongst females.

Key words: BMI, body weight abnormality, underweight, overweight, obesity, early adulthood.

INTRODUCTION

Anthropometric measurements are simple and widely used diagnostic tools for determining human development, maturation and wellness (Chinedu et al., 2013; WHO, 1995). Body mass index, BMI, indicates how much an individual's body weight conforms or departs from what is normal, healthy or desirable for a person of a specific height. Body weights are generally classified into normal weight, underweight, overweight or obesity using WHO cut-offs (WHO, 1995). Underweight, overweight and obesity have been linked to several morbidities and mortality and are therefore considered as abnormal or unhealthy body weights (Flegal et al., 2005; WHO, 1995). Obesity and underweight are the extremes of body weight abnormalities. Obesity causes physical discomfort,

psychological trauma and predisposes the individual to a complex health condition termed metabolic syndrome characterized by diabetes, lipid disorders, sleep apnea, respiratory diseases and hypertension leading to accelerated aging and cardiovascular disease (Abate, 1999; Akerman et al., 2004; Boden, 2002; Bustos et al., 2005; Bray, 2004). Underweight, on the other hand, is associated with malnutrition, anemia and infectious diseases such as malaria, pneumonia and HIV/AIDS and death (WHO, 1995; Durazo-Arvizu et al., 2008). Underweight patients often lack sufficient nutritional reserves to draw from during ill health and hence, are at a higher risk of mortality (Flegal et al., 2005).

The nutritional challenges facing developing nations

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Table 1. Anthropometric measurements: Weight, height, and BMI of young adults, aged 20 – 35 years, in Ota, Southwest Nigeria.

Parameter	Gender		Overall
	Male	Female	
Weight (kg)	71.57 ± 0.81*	63.76 ± 1.77	68.20 ± 0.92
Height (m)	1.78 ± 0.005*	1.66 ± 0.008	1.73 ± 0.005
BMI (kg/m ²)	22.77 ± 0.22 *	22.50 ± 0.30	22.66 ± 0.18

Mean ± SEM; *Male is significantly ($P < 0.05$) different from female (paired samples t-tests = .000 for weight, height and BMI).

have been compounded by rising incidence of obesity, a phenomenon attributed to the so called nutritional transition (Popkin, 1998). As a result, many developing countries including Nigeria are now plagued with the burden of weight excess due to over-nutrition and weight deficiency resulting from malnutrition (Durazo-Arvizu et al., 2008; Popkin and Doak, 1998; WHO, 1998). In Nigeria, a paradox of persistent underweight in children and a scourge of obesity in adults have been reported (Chinedu et al., 2012). Adult obesity has been reported to have reached an epidemic level constituting a major health threat (Akpa and Mato, 2008; Bakari et al., 2007; Kadiri and Salako, 1997). A local Nigerian newspaper recently described obesity as “a new silent killer in town” joining the ranks of malaria, HIV/AIDS and malnutrition (Ogundipe and Obinna, 2010). Most of the reports were however, based on studies involving middle aged adults or patients receiving treatment for hypertension, diabetes or related diseases (Puepet et al., 2002). The present study sought to examine the trend in body weight abnormality of persons in their early adulthood in Ota, Nigeria. Persons in the age bracket of 20 – 35 years are generally at the peak of their strength, biological functions and health, and are not subject to the problems of senescence (Shephard, 1998). Body weights of the age group could give an insight into the overall health status of a given population. In the study, anthropometric measurements and WHO cut-off were used to determine the prevalence of underweight, overweight and obesity among the young adult population of Ota, Southwest Nigeria.

SUBJECTS AND METHODS

A total of 341 healthy subjects (194 males and 147 non-pregnant females), aged 20–35 years, voluntarily participated in the study. All the subjects were residents of Canaanland in Ota, Ogun State, Nigeria. Weight (kg) was measured to the nearest 0.01 kg using Produex™ digital balance, Springfield, USA. Height (m) was measured to the nearest 0.001 m using meter rule with the subject standing barefooted, without cap or headgear. BMI (kg/m²) was calculated as $\text{Weight}/(\text{Height})^2$. Body weight categories were defined using WHO cut-offs as follows: underweight = $\text{BMI} \leq 18.4$ kg/m²; normal weight = $\text{BMI} \geq 18.5 \leq 24.9$ kg/m²; overweight = $\text{BMI} \geq 25.0 \leq 29.9$ kg/m²; obesity = $\text{BMI} \geq 30.0$ kg/m² (WHO, 1995). Obesity was further classified into three as follows: Class I = $\text{BMI} \geq 30.0 \leq 34.9$ kg/m², Class II = $\text{BMI} \geq 35.0 \leq 39.9$ kg/m² and Class

III = $\text{BMI} \geq 40.0$ kg/m². $\text{BMI} < 16.5$ kg/m² was classified as severely underweight.

Analyses of data were performed using SPSS software. Paired sample t-tests and Pearson chi-square tests were used to determine the significance of differences between the sexes. Differences were said to be significant at the level of $P < 0.05$. Results are expressed as mean ± standard error of mean (SEM).

RESULTS

Table 1 shows the mean values of the weight, height and BMI of the subjects. Male subjects had significantly ($p < 0.05$) higher values of weight, height and BMI than females. Male subjects weighed 71.57 ± 0.81 kg as against 63.76 ± 1.77 kg for females. The height was 1.78 ± 0.005 m for males and 1.66 ± 0.008 m for female subjects. The average BMI for both sexes was within the normal weight category; it was 22.77 ± 0.22 and 22.50 ± 0.30 kg/m² for male and female subjects, respectively. Paired samples tests showed a significance (2-tailed) value of .000 for weight, height and BMI of male and female subjects, respectively.

Table 2 shows the prevalence of the different body weight categories. Normal body weight was 76.3 and 64.0% respectively, for male and female subjects. Some of the female subjects (2.7%) were severely underweight whereas the male subjects had none in that category. The prevalence of Class I obesity was 2.1 and 2.7%, respectively, for the male and female subjects whereas Class II obesity was 0.5 and 0.7% prevalent in male and female subjects, respectively. There was no subject in Class III obesity. Pearson Chi-Square showed a significance (2 sided) of .008 between the sexes.

The percentage distribution of abnormal weight is shown in Figure 1. Overweight was 18.6% prevalent whereas underweight and obesity each had 2.6% prevalence in male subjects. In contrast, a prevalence of 12.9, 19.7 and 3.4%, respectively, was recorded for underweight, overweight and obesity amongst female subjects.

DISCUSSION

The anthropometric measurements show that male subjects were significantly ($p < 0.05$) bigger than their

Table 2. Prevalence of different body weight categories amongst young adults aged 20 – 35 years, in Ota, Southwest Nigeria.

BMI (kg/m ²)	Body weight category	Frequency [Number (%)]		
		*Male	Female	Overall
< 16.5	Severely Underweight	0 (0.0)	4 (2.7)	4 (1.2)
□ 16.5 □ 18.4	Underweight	5 (2.6)	15 (10.2)	20 (5.9)
□ 18.5 □ 24.9	Normal weight	148 (76.3)	94 (64.0)	242 (71.0)
□ 25.0 □ 29.9	Overweight	36 (18.6)	29 (19.7)	65 (19.1)
□ 30.0 □ 34.9	Obesity (Class I)	4 (2.1)	4 (2.7)	8 (2.4)
□ 35.0 □ 39.9	Obesity (Class II)	1 (0.5)	1 (0.7)	2 (0.6)
> 40.0	Obesity (Class III)	0 (0.0)	0 (0.0)	0 (0.0)
	Total	194 (100)	147 (100)	341 (100)

*Male is significantly ($P < 0.05$) different from female (Pearson Chi-Square = .008 for chi-square tests of gender and body weight categories).

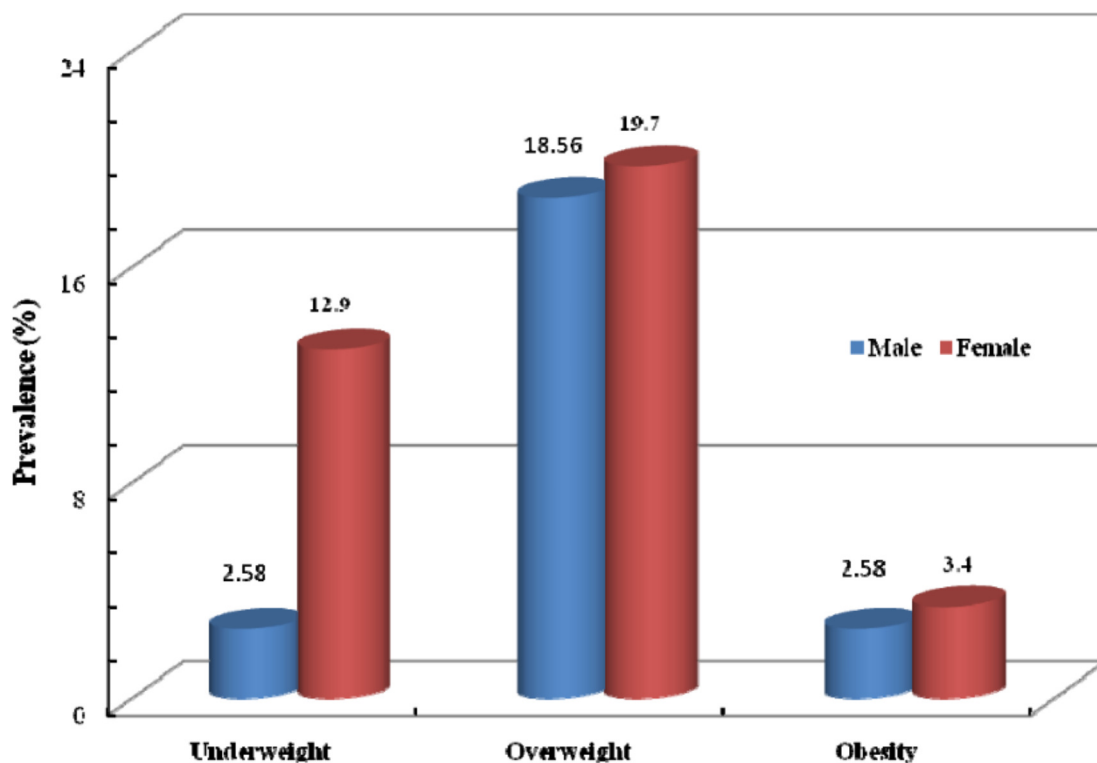


Figure 1. Percentage distribution of abnormal body weights (underweight, overweight and obesity) amongst male and female young adults in Ota, Southwest Nigeria.

female counterparts. The pattern of body weight distribution among the sexes was also significantly different at $P < 0.05$. A large number of the subjects had normal weight which signifies good health and low mortality rate; the prevalence of normal weight was higher in male subjects (76.3%) compared to females (64.0%). Body weight abnormalities (underweight, overweight and

obesity) occurred more in females than in male subjects (Figure 1). The trend is similar to reports of other population-based studies in Nigeria (Bakari et al., 2007; Peupet et al., 2002). It underscores the role of sex as a determinant of the stature and body weight of individuals. Gender differences in lifestyles and dietary habits could account for the observed differences between male and

female subjects. The high incidence of underweight in the female subjects may be attributed to the 'slim-fit' syndrome among young Nigerian women. Most women in the age range are unduly concerned about their shape and make deliberate efforts to maintain a trim shape. The social consideration profoundly affects the diets and eating pattern of many young women in Nigeria. As a result of poor eating habits, the women end up being malnourished. Unfortunately, low body weight has been linked to greater mortality risk; underweight individuals usually do not have enough nutritional reserve to mobilize during illness (Akpa and Mato, 2008). Females within this age range may therefore be more vulnerable to infectious diseases such as malaria, pneumonia, diarrhea and HIV/AIDS (Flegal et al., 2005). Males, on the other hand, have little concern about their weight.

Overall, the incidence of weight excess exceeded that of weight deficiency. Overweight was the most prevalent weight abnormality in both male and female subjects. The high prevalence of overweight in both sexes is very significant. There appears to be a significant weight gain and a gradual build-up of body weight at early adulthood. This may eventually snowball into obesity at a later period of life with advancement in age and attendant assumption of a more sedentary and restful lifestyle. The prevalence of overweight and obesity was similar to that reported in Jos, another Nigerian city (Puepet et al., 2002). Higher incidence of obesity and overweight in female subjects may be as a result of the greater tendency of women to accumulate more fat than their male counterparts. There is low prevalence of obesity amongst the young adult subjects. This may be due to the fact that people within the age bracket are usually very active and at the very peak of their strength, biological functions and health, and devoid of the problems of senescence (Shephard, 1998). Interestingly, Class I and II obesity were recorded in both male and female subjects. Class I obesity was significantly more prevalent than Class II obesity.

Conclusion

Overweight was the most prevalent body weight abnormality amongst young adults in Ota, Nigeria. Sex and other social factors generally influence the stature and body weight status of individuals within the age range. Females are more prone to body weight abnormality than males of the same age. Overweight and underweight were widespread amongst female subjects. There is need to tackle the dual challenge of overweight and underweight amongst young female Nigerian adults.

Conflict of Interests

The author(s) have not declared any conflict of interests.

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