

Perceived Body Weight and Actual Body Mass Index (BMI) in Urban Poor Communities in Accra, Ghana

Grace Agyemang Frempong¹, Ama de-Graft Aikins¹ and Delali Margaret Badasu¹

¹Regional Institute for population studies, University of Ghana, Legon-Accra

Emails: gracea72@gmail.com, adaikins@ug.edu.gh, dbadasu@ug.edu.gh

Extended abstract

Introduction

Body weight (especially overweight and obesity) has become an important global public health concern because of its health implications (World Health Organization (WHO), 2002). Excess body weight (overweight and obesity) is associated with serious health implications, including increased risk for cardiovascular and other chronic disorders. Although the risks associated with overweight or obesity are known, its prevalence continues to increase in many countries (Inoue et al., 2007).

WHO (2008) global estimates showed that more than 1.4 billion adults aged 20 years and over, were overweight in 2008. Of these overweight adults, over 200 million men and about 300 million women were obese. The rapid rate of urbanisation, globalisation and economic growth taking place in developing countries (Popkin and Gordon-Larsen, 2004) have been identified as some of the major factors contributing to obesity in low and middle income countries. On the other hand, the problem of underweight is faced in Sub-Saharan Africa because of high levels of malnutrition, starvation and poverty (WHO, 2006). In Ghana, several studies conducted have established that the prevalence of obesity is higher in urban cities like Accra (Dake et al., 2010; Biritwum et al., 2005 and Amoah, 2003). However, underweight (BMI < 18.5) is also prevalent particularly in rural areas (Dake et al., 2010).

Regardless of whether a person is underweight, overweight or obese, behavioural change is one key aspect of weight control (Brener et al., 2004). Theoretical models of health behaviour change emphasize the necessity of perceiving oneself 'at risk' as a prerequisite to behaviour change (Gregory et al., 2008; Inoue, 2007 et al., 2009). Yet, many people tend to misperceive their weight. The objective of this paper is to examine the association between perceived weight and actual BMI among residents in three urban poor communities in Accra. It also sought to find out whether perceived weight determines an individual's weight control behavior and practices.

Methodology

Source of Data

The study uses the second round of EDULINK Urban Health and Poverty Project. This is a survey conducted in three poor urban communities in Accra, Ghana by the Regional institute for Population studies. A total of 974 individuals Ghanaians were eligible to be interviewed for the individual questionnaire but only 700 participants whose anthropometric measurements were taken formed the sample of the present study.

Dependent variables

The BMI of the respondents was used as a measure for the dependent variable. BMI is obtained by dividing the respondent's weight in kilograms by the square of height in metres. Based on their BMI values individuals are classified as underweight ($BMI < 18.50 \text{ kg/m}^2$), normal weight ($BMI = 18.50-24.99 \text{ kg/m}^2$), overweight ($BMI = 25.00-29.99 \text{ kg/m}^2$) or obese ($BMI \geq 30.00 \text{ kg/m}^2$) (WHO, 2004).

Independent Variable

The perception people had about their weight was assessed using Duda et al's (2007) culturally adapted prototype figural stimuli for Ghanaian women and men. The body images were developed using computerized body morph assessment tools (Adobe Photoshop and Abrosoft Fanta Morph3). The figural stimuli consist of a series of 12 silhouette images of men and women whose weight ranges from extreme thinness to morbidly obese. The following question was asked to ascertain the perception respondents had about their current weight. "How do you perceive your weight?" Using the numerical responses to the question, a four-category variable of the various BMI measures (underweight, normal weight, overweight and obese) was created based on the various cut-off points. Figural stimuli with numerical values 1-3 constituted underweight, images 4, 5 and 6, normal weight, 7 and 8-overweight while 9, 10, 11 and 12 constituted obese category.

Intermediate variables

Weight management goals (trying to lose weight, gain weight, stay about the same or doing nothing about it) and weight control practices (dietary behaviour and leisure-time physical activity) were used as intermediate variables. The question "how much time do you spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day?"

was a measure for physical activity. Two categories were created: Physically active (≥ 30 mins in a day), physically inactive (< 30 mins a day).

In relation to dietary behaviour, dietary diversity score was used as a measure of food quality. It does not take into consideration the quantity or portion sizes as well as the frequency of food consumed (Kennedy et al., 2010; Azadbakht, and Esmailzadeh, 2010). A total of 82 food items which were grouped into 9 categories, namely: Starchy foods, Pulses, milk and dairy, egg, meat and fish, fruits, vegetables, fat and oils, sugar and sugary foods. Dietary behaviour was categorised into low dietary diversity score and high dietary diversity score based on a mean score of 7. Low dietary diversity (<7) and High dietary diversity (≥ 7)

Methods of analysis

This study made use of basic statistical techniques including frequencies, percentages and cross tabulations. Also, a multinomial logistic regression analysis was carried out to determine the net effect of the background characteristics and intermediate variables on the dependent variable. The statistical analysis for the present study was carried out using the SPSS statistical software package version 17.0 (SPSS Inc., Chicago, IL, USA).

Results

The result shows that a high proportion of the respondents did not have adequate perception about their weight (Table 1). Misperception of body weight was higher at the extreme ends of the BMI categories (underweight, obese). Underestimation of body weight was higher among respondents who perceived themselves to be underweight. Less than a quarter (20.9%) of this group correctly perceived their weight while more than three quarters (79.4%) of them underestimated their weight. That is to say, they were bigger than they thought they were. On the other hand, overestimation of body weight was also higher among respondents who thought they were obese. Although a little above half (55.2%) of them correctly perceived themselves as obese, more than a third (44.8%) of them overestimated their weight. They were thinner than they thought they were. The association between weight perception and actual BMI was statistically significant (P value=0.000).

The perceptions participants had about their body weight influenced their dietary behaviour but not their engagement in physical activity. Respondents did not combine physical activity with diet to manage or control their weight. Generally, while most of them had high dietary diversity score, majority of them were physically inactive. For example, 83.9% of those who

perceived themselves to be obese had high dietary diversity score (good dietary behaviour) but 92% was physically inactive. This may put them at risk of obesity. This has implications for quality of life of residents in these urban poor communities which are already at higher risk of under-nutrition (Table 2).

Table 1: Percentage distribution of Respondents by perceived weight and Actual BMI

| Perceived weight | Actual BMI (%) | | | | Total No. |
|--------------------------------------|----------------|---------------|----------------------|-------------|------------|
| | Underweight | Normal weight | Overweight | Obese | |
| Underweight | 20.6 | 74.6 | 1.6 | 3.2 | 63 |
| Normal weight | 9.3 | 67.8 | 16.9 | 6.0 | 366 |
| Overweight | 0.5 | 39.1 | 32.1 | 28.3 | 184 |
| Obese | 1.1 | 13.8 | 29.9 | 55.2 | 87 |
| Total | 7.0 | 54.1 | 21.1 | 17.7 | 700 |
| X² value = 230.173 | | df= 9 | P value=0.000 | | |

Source: EDULINK data, 2011

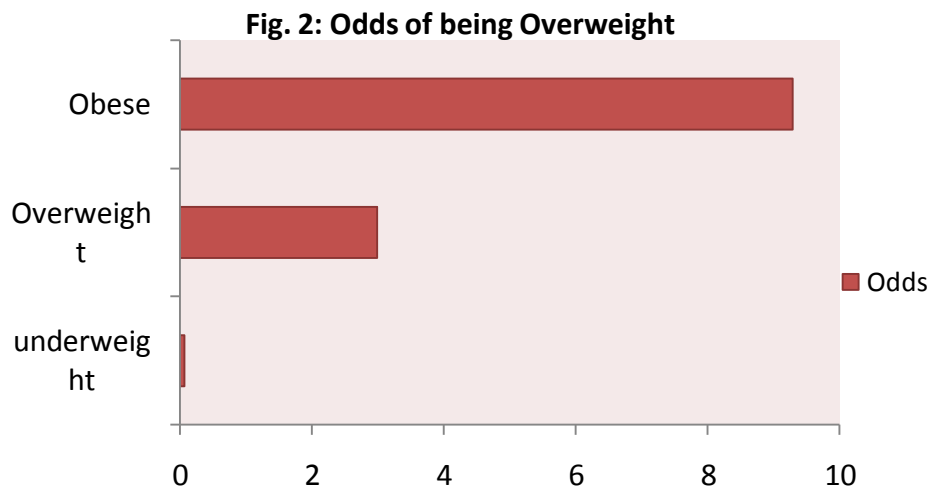
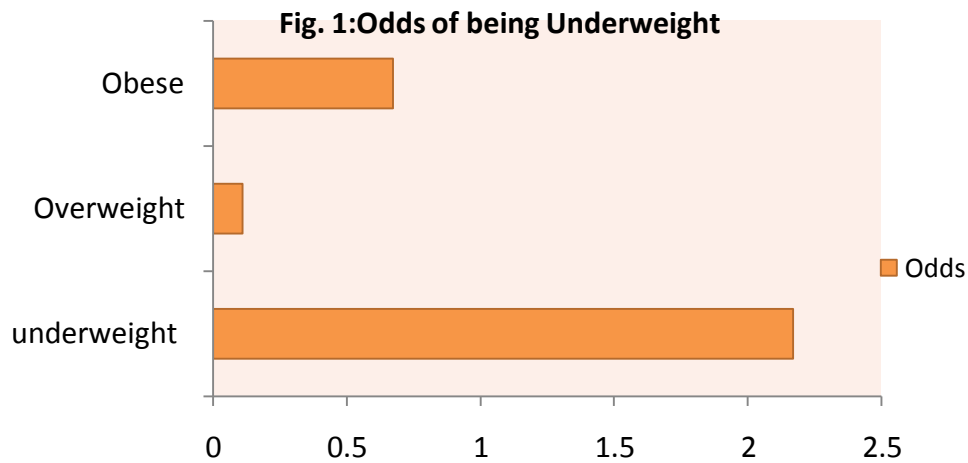
Table 2: Percentage distribution of Respondents by perceived weight and weight control variables

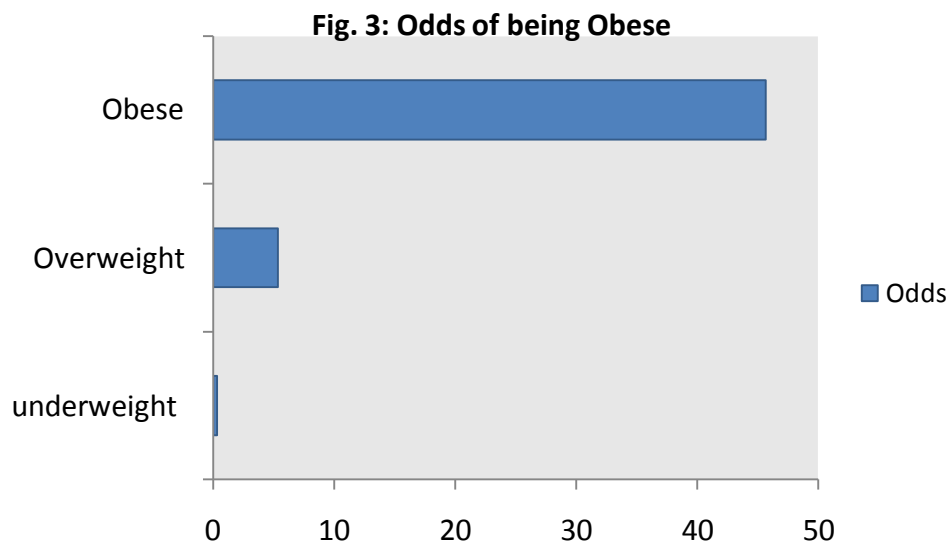
| Perceived weight | Actual BMI (%) | | | | Total No. |
|----------------------------|-------------------|---------------------|------------------------------|------------------------------|------------|
| | Physically active | Physically inactive | Low dietary diversity score | High dietary diversity score | |
| Underweight | 9.5 | 90.5 | 23.8 | 76.2 | 63 |
| Normal weight | 10.4 | 89.6 | 30.3 | 69.7 | 366 |
| Overweight | 6.5 | 93.5 | 21.7 | 78.3 | 184 |
| Obese | 8.0 | 92.8 | 16.1 | 83.9 | 87 |
| Total | 9.0 | 91.0 | 25.7 | 74.3 | 700 |
| χ²=2.352 | | P =0.503 | χ² = 9.937 | P value= 0.019 | |

Source: EDULINK data, 2011

In the multinomial regression analysis, perceived body weight remained significantly associated with actual BMI even after controlling for some confounders. Generally, participants' perceptions about their weight corresponded with actual BMI status.

Participants who perceived themselves as underweight were significantly 2.2 times more likely than those who perceived themselves as normal weight to be actually underweight. Those who perceived themselves as overweight and obese were 3.1 times and 9.6 times respectively more likely than those who perceived themselves as normal weight to be overweight. On the other hand, participants who perceived themselves as overweight and obese were 5.4 times and 45.7 times more likely to be obese than those who perceived themselves to be normal weight (fig. 3, fig. 4 and fig. 5). Other variables that predicted BMI were sex, age, marital status and type of occupation (Table not shown)





References

- Amoah G.B.A., 2003. Socio-demographic variations in obesity among Ghanaian adults. *Public Health Nutrition* 6, 751 -757
- Azadbakht, L and Esmailzadeh, A., 2010. Dietary diversity score is related to obesity and abdominal adiposity among Iranian female youth. *Public Health Nutrition*: 14(1), 62–69
- Biritwum, R.B., Gyapong. J., and Mensah, G., 2005. The Epidemiology of Obesity in Ghana. *Ghana Medical Journal*, 39(3), 82-85
- Brener N.D, Eaton D.K, Lowry R and McManus T., 2004. The association between weight perception and BMI among high school students. *Obesity Research.*, 12, 1866 –1874.
- Cheung Y.T.K, Lee A.M, Ho S.Y, Li E.T.S, Lam T.H, Fan S.Y.S and Yip P.S.F., 2011. Who wants a slimmer body? The relationship between body weight status, education level and body shape dissatisfaction among young adults in Hong Kong. *BioMed Central Public Health* 11,835
- Dake F. A. A., Tawiah E.O. and Badasu D. M ., 2010. Socio-demographic correlates of obesity among Ghanaian women. *Public Health Nutrition*, 14(7), 1285-1291
- Duda RB, Jumah NA, Hill AG, Seffah J, Biritwum R., 2007. Assessment of the Ideal Body Image of Women in Accra, Ghana. *Tropical Doctor*.
- Ghana Statistical Service (GSS), Noguchi Memorial Institute for Medical Research (NMIMR), and ORC Macro (2009). *Ghana Demographic and Health Survey 2008*. Calverton, Maryland: GSS, NMIMR, and ORC Macro.
- Gregory, C.O., Blanck, H.M., Gillespie, C., Maynard, M. L and Serdula, M. K. 2008. Health perceptions and demographic characteristics associated with underassessment of Body weight. *Obesity* 16, 979–986
- Inoue, M., 2007. Degree of agreement between weight perception and Body Mass Index of Japanese workers: My health up study. *Journal of occupational health*, 49,376-381
- Kennedy, G.L., 2009. Evaluation of Dietary Diversity Scores for Assessment of Micronutrient intake and Food Security in Developing Countries. <http://www.jn.nutrition.org/content/137/2/472.long>
- Popkin, B.M. and Gordon-Larsen, P. 2004. “The Nutrition Transition: Worldwide Obesity Dynamics And Their Determinants” *International Journal of Obesity*, 28:S2-S9.
- World Health Organisation. 2006. “Obesity and Overweight”. Available at <http://www.who.int/mediacentre/factsheets/fs311/en/>.
- World Health Organization, 2002. Controlling the global obesity epidemic. World Health Organization[[http://www.who.int/nutrition/topics/World Health Report 2002: reducing risks, promoting healthy life](http://www.who.int/nutrition/topics/World%20Health%20Report%202002%3A%20reducing%20risks,%20promoting%20healthy%20life). Geneva, WHO, 2002.