

Relationship between Body Weight Perceptions and Nutritional Status of Tertiary Students

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Abstract: *Weight perception is described in different dimensions which are interlinked in order to form the attitudes concerning one's body. It reflects how one sees, thinks, feels, and acts toward their own body. This study was aimed at determining the relationship between body weight perceptions and nutritional status of tertiary students among some selected tertiary students in the Sagnarigu municipality. A correlational research design was used for this study. A cross-sectional study was used with a sample size of two-hundred and fifty (250) students from some selected three public tertiary institutions. Data was collected using a semi-structured questionnaire. Statistical package for social sciences (SPSS) version 21 software was implored to analyze data obtained using frequencies and fisher's test. It was found out that majority (55.6%) of the respondents perceived themselves to have normal weight, a little more (20.4%) people did not know or did not have any idea about their body weight. The study revealed a significant and interesting association among weight perception and nutritional status. It was recommended that Ghana Health Service should increase campaign for regular health checkups as this would promote accurate knowledge and perception about peoples' perception on their weight status and prevent unhealthy weight management practices and weight related problems.*

Keywords: Body Weight perceptions, Nutritional Status, Overweight, Obesity, cognitive body image, Malnutrition, Poor Appetite

1 INTRODUCTION

The perceptual body image refers to how one sees his or her body. The perceived body weight status is not always a true representation of the actual body weight status, and so weight misperception is said to occur when there is discordance between an individual's actual weight and the perception of his or her weight. In the Youth Smoking Survey, 2003-2004 among 20,677 normal weight students aged 11-18 years from 85 randomly selected schools throughout Hong Kong, misperceived fatness or thinness were found to be associated with adverse psychosocial outcomes including headache, feeling stressful, depression, poor appetite, insomnia, nightmares, and less confidence in getting along with friends. Weight has become a global concern due to the number of adverse physical and psychological consequences related to it [1]. These problems affect individuals' emotional well-being, because many overweight and underweight people alike are said to be extremely unhappy with their body for various reasons.

Weight perception constitutes one of the four modules of body image; the other components include effectual body image, cognitive body image and behavioral body image. The perceptual body image refers to how one sees his or her body. The perceived body weight status is not always a true representation of the actual body weight status, and so weight misperception is said to occur when there is discordance between an individual's actual weight and the perception of his or her weight [2]. The complex relationship between weight status and body image is important because of its influence on adolescent health behaviors. Negative health consequences may result from the unique interaction between weight status and body image.

Body image dissatisfaction and disordered eating attitudes and behaviors are pervasive problems in Western society. The rate at which young adults are becoming aware of their body weight and initiating lifestyle behaviors to change it is highly accelerating hence there is a need to study in this area to provide information to appropriately address it. This study of [3] and [4] demonstrated that most adolescents had accurate perceptions about their body weight. However, females were more likely to misperceive themselves as overweight, whereas males were more likely to misperceive themselves as underweight. A sub cohort study of 2,179 healthy Chinese adolescents found that boys were more likely to perceive themselves as underweight, whereas girls were more likely to perceive themselves as overweight.

Malnutrition refers to an impairment of health resulting from a deficiency or from an excess or imbalance of nutrients. It is of public health significance among adolescents across the world [5]. Overweight and obesity have become the fifth leading risk for global deaths. Office employees have been identified as a high-risk group due to the sedentary nature of their work. Once considered a high-income country problem, overweight and obesity are now on the rise in low- and middle-income countries, particularly in urban settings. In 2014, more than 1.9 billion adults, 18 years and older, were overweight of these, over 600 million were obese. Overall, in 2014, about 13% of the world's adult population (11% of men and 15% of women) were obese, while 39% of adults aged 18 years and over (38% of men and 40% of women) were overweight. In Africa, the number of children who are overweight or obese has nearly doubled from 5.4 million in 1990 to 10.6 million in 2014 [2].

The global epidemic of overweight and obesity is believed to be driven by the increased intake of energy dense foods that are high in fat and an increase in physical inactivity due to the increasingly sedentary nature of many forms of work, changing modes of transportation and increasing urbanization across the globe [2]. BMI calculated from self-reported height and weight has a greater concordance with weight perceptions than it does with BMI calculated from measured height and weight. This is not surprising, given the tendency of adolescents to underestimate their weight and overestimate their height compared with measured values.

A complex range of factors influences body image perception. These include socio-demographic factors (gender; age; country), nutrition, and psycho-social factors e.g., stress, social support and quality of life. Socio-demographic factors (gender, age, country): girls are more likely to express weight dissatisfaction than boys, and body weight perception and dissatisfaction are correlates for weight control practices [6]. Indeed, an increasing public health challenge is that 2% to 4% of young adult females have full-syndrome eating disorders that harm their general health and may cause death [7]. There is a growing number of people globally who are underweight, overweight or obese [8]. This brings about distorted perception of their body weight. This distortion of people's body weight perceptions makes them unsatisfied causing them to engage in both healthy and unhealthy weight management practices. Overweight and obesity have become the fifth leading risk for global deaths. Most of the world's population lives in countries where overweight and obesity kills more people than underweight. At least 2.8 million adults die each year as a result of being overweight or obese.

Due to high morbidity and mortality from overweight and obesity, individuals with these conditions suffer from adverse psychosocial outcomes including, stigmatization and discrimination, depression, dissatisfaction with body image, poor quality of life, and suicidal ideation or attempts, particularly among women and adolescents. Importantly, occurrence of these adverse psychosocial outcomes, and adoption or otherwise of healthy weight control behaviors are largely determined by how individuals perceive their weight, and not their actual weight status. This study was undertaken to determine the relationship between body weight perceptions and nutritional status of tertiary students among some selected tertiary students in the Sagnarigu municipality.

2 MATERIALS AND METHODS

2.1 Research design

This study followed a quantitative research methodology. More specifically, a correlational research design was used for this study. This methodology followed an empiricist approach to research which involves gaining knowledge through careful and controlled direct or indirect observation [9].

2.2 Study area

The study was carried out in some tertiary institutions within the Sagnarigu municipality. The Sagnarigu municipality is one of the 250 metropolitan, municipal and district Assemblies (MMDAs) in Ghana, and forms part of the 28 MMDAs in the northern region. The Sagnarigu municipality was carved from Tamale and inaugurated at the various locations simultaneously on the 28th June, 2012 by legislative instrument (LI) 2066. The municipality lies between latitude 9 degree 16' and 9 degrees 34' north and longitude 0 degree 36' and 0 degree 57' west with administrative capital Sagnarigu and covers a total land size of 200.4km square. The municipality shares boundaries with the Savelugu municipal to the North, Tamale metropolis to the South East, Tolon district to the west and Kumbungu district to the North-west. The population of the municipality according to 2010 population and houses census stands at 148,099 with 74,886 males and 73,213 females.

2.3 Study population and sampling technique

The target population comprised of students in some tertiary institutions of the Sagnarigu municipality: Tamale College of Education, Bagabaga College of Education and Tamale Technical University. Both males and females from the two teacher training colleges in Sagnarigu municipality and Tamale Technical University were considered as part of the study when they agreed to the inform consent and not included if otherwise. Cross-sectional design was used in executing this study. Study participants were selected from various tertiary institutions in order to get a representative sample and convenience sampling was used to select study participants from schools. Participants were contacted or recruited with the help of a lecturer more especially Tamale College of Education from selected institutions. With the aid of the institution databases, an open invitation was sent to all the potential participants and those who indicated interest and volunteered to participate in the research were included in the study. The individuals to be contacted were selected at random. The targeted sample included participants representing a diversity of socio-demographic characteristics of age, race and gender. Convenience sampling was used in order to meet sample size requirement within the stipulated data collection period. Hence, the responses of study participants do not necessarily represent the entire emerging adult population. Stands were set up at both study sites and the objectives of the study were thoroughly explained to prospective participants who were approached by the researchers. Individuals were included if they were between the ages of 16 to 30 years. The benefit of using a convenience sampling method is that, it is economical (Spies, 2012). The disadvantage is that it is based on personal judgment; it may be biased because each member of the population does not have an equal chance of being in the study and the results cannot be generalized with a high degree of confidence to the larger population[10].

2.4 Sample size determination

The sample size of this study was 250 students. This sample size was calculated based on prevalence of obesity/overweight (P=19%) from similar study done at the University for Development Studies Tamale, Ghana [11]. The Cochran's formula would be used to calculate the minimum sample size required. Thus;

$$n = \frac{z^2 \times (p) \times (1 - p)}{e^2}$$

Where

n= minimum sample size required

Z= Z value (1.96, that corresponds to 95% CI

e = Marginal error or precision required (0.02)

P= Prevalence of obesity among students from previous studies.

2.5 Socio-demographic characteristics of respondents

A total of 121 (48.4%) females and 129 (51.6%) of males participated in the study. From the entire 250 respondents 8.8% were aged less than 20 years and 21.6% were 25 years plus while majority (69.6%) of the participants was between 20 – 24 years. Majority of the participants were Muslims (62.8%) and 36.8% constituted Christians while only one person was identified to be a traditionalist. Also, Dagombas were recorded to be the major ethnic group with (36.4%), Gonjas were 12.8% and 50.8% constituted different other ethnic groups including Akan, Frafra, Bimoba and others. The details on socio-demographics are shown in Table 1.

Table 1 Percentage distribution of respondents by socio-demographic characteristics

Variable	Frequency (N)	Percentage (%)
Age		
Below 20	22	8.8
20 – 24	174	69.6
25+	54	21.6
Sex		
Male	129	51.6
female	121	48.4
Religion		
Islam	157	62.8
Christianity	92	36.8
Traditional	1	0.4
Ethnicity		
Dagomba	91	36.4
Gonja	32	12.8
Others	127	50.8
Marital status		
Single	231	92.4
Married	19	7.6
Fathers' educational level		
None	127	50.8
Primary	26	10.4
Variable	Frequency (N)	Percentage (%)
Middle/JHS	38	15.2
SHS	12	4.8
Tertiary	47	18.8

Mothers' educational level

None	157	62.8
Primary	33	13.2
Middle/JHS	35	14.0
SHS	7	2.8
Tertiary	18	7.2

Mothers' occupation

None	7	2.8
Farming	72	28.8
Trading	155	62.0
Civil servant	13	5.2
Seamstress	3	1.21

Fathers' occupation

None	2	0.8
Farming	139	55.6
Trading	48	19.2
Civil servant	34	13.6
Clergy	7	2.8

Source; field survey, 2019

2.6 Data collection tools

A questionnaire was prepared in English language for the data collection. The questionnaire was assessed for clarity, length and completeness. The questionnaires were administered to students after class, during leisure times and after school hours. Weight and height measurements were taken as per standard procedures (CDC. Anthropometry procedures manual: GA Atlanta. 2007). The height of study participants was taken using a portable wall-mounted Seca weighing scale and Stadiometer; participants stood upright with their back against a wall and their head in the Frankfurt horizontal plane while the researcher and one field assistant took the height measurement. The weight was measured using an Ohaus SD 200 digital weighing scale; participants wore light clothing and were barefoot or wearing light socks whilst their weight and height were being measured. A pretested questionnaire was used to obtain demographic information, weight perceptions, as well as weight management practices. The questionnaire was interviewer-administered and on average 20 min was spent on each participant. The resultant weight in kilograms and height in meters was used to calculate the BMI of the participants.

2.7 Procedures

The data were only collected after ethical clearance had been granted by the various selected tertiary institution administrative body. The participants in the proposed survey were tertiary students in the Sagnarigu municipality. The purpose of the research was explained in the open invitation letter and participants' information sheet, and participants were informed of their rights before volunteering to participate in the study. The questionnaire was only available in English.

2.8 Data analysis

Data were entered and analyzed using IBM SPSS version 20. Descriptive statistics was used to describe and analyze gender, age, ethnicity, parents' educational level and other socio-demographic characteristics. BMI was calculated as weight (Kg) divided by height (m) squared. Participants were classified into in to 4 groups according to WHO guidelines as follows: underweight (BMI less than 18.5kg/m²), normal weight (BMI 18.5 – 24.90kg/m²), overweight (BMI 25.00 – 29.00kg/m²), and obese (BMI greater than 30.00kg/m²). Evaluation of BMI and respondents perceived weight was done. Also, evaluation of weight perception with respect to nutritional status was done.

2.9 Ethical considerations

Approval to conduct the research was sought from the department of nutritional sciences of the university (UDS). Permission to conduct the research in the various institutions were granted by the Principals of respective institutions which paved a way for the study to be conducted successfully, this helped us in maintaining trust and cooperation from respondents. The participants were requested to give their consent before participating in the study. Participation in this study was voluntary. Confidentiality of the participants was guaranteed, since no identifying information was sought from them. There were no foreseeable risks and discomforts anticipated by participating in this survey study. The participants could at any point during the study choose to withdraw without any consequences. No form of remuneration for participation in this study was offered.

RESULTS AND DISCUSSION

Table 2 Respondents' knowledge of their body weight status

Knowledge of Body weight	Frequency	Percentage
Yes	98	39.2
No	152	60.8

Source; field survey, 2019

The first objective of the study was to find out student's body weight perceptions. The finding shows that respondents perceived their bodyweights differently as in shown in Table 2; only 39.2% knew their weight status at the time of the interview while majority (60.8%) of them did not know their weight status.

Table 3 Source of knowledge of students' bodyweight

Source of Knowledge	Frequency	Percentage %
Hospital records	54	21.6
Personal check up	43	17.2
Other (friends, works)	1	0.4

Source; field survey, 2019

This objective of the study was to find out sources of knowledge of their bodyweight. The findings are shown in table 3. Majority of the respondents who knew their body weight status at the time of the interview had their source of knowledge from hospital records which represents 20.4% and 17.2% of them knew their weight status from personal checkups while 0.4% of respondent's knew their weight through other means.

Table 4 Percentage distribution of respondents' perceptions about their bodyweight

Perceptions	Frequency	Percentage (%)
Underweight	44.0	17.6
Normal weight	139.0	55.6
Overweight/Obesity	16.0	6.4
Do not know	51.0	20.4

Source; field survey, 2019

The first objective of the study was to find out respondents' perception about their bodyweight. The findings show that the respondents perceived their bodyweights differently. This result is as shown in table 4. Majority (55.6%) of the respondents perceived themselves to have a normal weight, and 20.4% of them did not know or did not have any idea about their bodyweight. But 17.6% of the respondents perceived themselves to be underweight and only 6.4% people considered themselves as overweight or obese. The percentage of respondents who had knowledge of body weight was 39.2%.

Table 5 Factors influencing weight perception

Factors influencing weight perception	Frequency (N)	Percentages (%)
Social media	35	14
Friends	90	36
Relationship	32	12
Culture /religion	45	18
Exercise	20	8
Food	5	2
Others	9	3.6
None	14	5.6

Source; field survey, 2019

Table 5 presents factors that influence student's body weight perceptions. It is clear from the results that friends play an important role in influencing body weight perception with 36% while cultural values or religion play significant roles influencing bodyweight with 18%.

Table 6 Percentage distribution of perception about underweight people

Perceptions about underweight	Frequency(N)	Percentage (%)
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Very healthy	138	15.2
Rich	1	0.4
Beautiful	13	5.2
Not healthy	142	56.8
Physical inactive	38	15.2
Nature	9	3.6
Physically active	3	1.2
Don't know	2	0.8
None	4	1.6

Source; field survey, 2019

People also have different perception toward underweight people. Table 6 shows the perception of respondents about how they perceived people who are underweight. More than half (51.6%) of the respondents considered underweight people as not healthy. Respondents who perceived underweight people to be very healthy constituted 7.2.2% but 32.4% of the respondents perceived underweight people as physical inactive. And only a very few people also considered underweight people as either being beautiful or being physical active.

Table 7 Percentage distribution of perception of overweight people

Perception	Frequency (N)	Percentage (%)
Very healthy	21	8.4
Rich	4	1.6
Beautiful	3	1.2
Not healthy	95	38.0
Physical inactive	114	45.6
Nature	1	0.4
Don't know	10	4.0
None	2	0.8

Source; field survey, 2019

Respondents perception about people who are overweight as part our first objective indicated in table 7 shows that majority perceived overweight people as not healthy were 38.0%, 45.6% people perceived them to be physically inactive and only 8.4% people perceived overweight people as being very healthy.

Table 8 Percentage distribution of perception about obese people

Perception	Frequency (N)	Percentage (%)
Very healthy	18	7.2
Rich	7	2.8
Beautiful	4	1.6
Not healthy	129	51.6
Physical inactive	81	32.4
Inheritance	4	1.6
Natural	1	0.4
Do not know	4	1.6
None	2	0.8

Source; field survey, 2019

Table 8 presents results of respondents' perceptions about obese people. Majority perceived people who are obese as not healthy representing 51.6%, 32.4% perceived as being physically inactive.

Table 9 Respondents' state of being terrified about underweight, overweight and obesity

Student state of being terrified about underweight, overweight and obesity	Frequency (N)	Percentage (%)
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Always	26	10.4
Usually	18	7.2
Often	14	5.6
Sometimes	118	47.2
Rarely	18	7.2
Never	56	22.4

Source; field survey, 2019

The results in table 9 shows that students are sometimes terrified of being underweight, overweight or obese. The result shows that 47.2% are sometimes being terrified, those who were always terrified were 10.4% and 22.4% of them were never terrified about their bodyweight.

Table 10 Percentage distribution by nutritional status

BMI Category	Frequency (N)	Percentage (%)
Underweight	14	5.6
Normal	202	80.8
Overweight/Obese	34	34.0
Mean BMI = 23.9kg/m ²		

Source; field survey, 2019

The second objective of the study was to find out nutritional status of students and with the help of the standard measurements of BMI by WHO, the height and weight measurements of the respondents were categorized in accordance with standard BMI measurements.

Our findings in Table 10 show the percentage distribution of the respondents according to the actual BMI categories. Generally, the mean BMI was 23.9kg/m². More than one- half (80.8%) of them had normal body size, while an appreciably high (34.0%) number of them were also overweight or obese and only 5.6% people were underweight. This indicates that the study population is averagely having a normal weight

Table 10 Percentage distribution of weight perception and nutritional status

Weight Perception	NUTRITIONAL STATUS			Test statistic Fisher's exact test =15.243 P=0.04
	Underweight Percentage (%)	Normal Percentage (%)	Overweight/obesity Percentage (%)	
Underweight	13.6	84.1	2.3	P=0.04
Normal	3.6	83.5	12.9	
Overweight/obesity	0.00	81.3	18.8	
Do not know	5.9	70.6	23.5	

Source; field survey, 2019

Relationship between weight perception and nutritional status is one the objectives of the study as indicated. From the results, 3.6% perceived themselves to have a normal weight but were actually underweight. It also shows that, 83.5% perceived themselves as underweight but actually had normal weight. Furthermore, 12.9% were actually overweight or obese, 5.9% did not know how they perceived their body weight but were actually underweight.

Fisher's exact test was used to determine the relationship between perceived bodyweight and nutritional of participants was 15.243 while P value was 0.04. In all, the relationship was statistically significant (p < 0.05).

DISCUSSION

Body weight perception was classified on student's perception on their own current body weight, perception on people who are underweight, overweight and obese and the source of knowledge of their bodyweight and whether they are terrified about being underweight, overweight or obese as well as factors influencing their body weight. From the study, respondents perceived their bodyweights differently. Majority (55.6%) of the respondents perceived themselves to have a normal weight. Those who did not know or did not have any idea about their bodyweight were 20.4%. But 17.6% perceived themselves to be underweight and only 6.4% considered themselves as overweight or obese. This finding is consistent with many different studies, including the studies of [3], [4] and [12] which reveal that the mean age of 21 years perceived themselves to have a normal body weight status with a fair number of them perceiving themselves to be slimmer or underweight. This study also shows that a very small number of people (6.4%) perceived themselves to be overweight or obese. This tells us that, majority of the students do not perceive obesity or over weight to be an ideal body status. This correlates with previous study conducted by [13] which reported that young African population are less likely than other racial groups to perceive themselves as overweight or obese.

Moreover, respondents had different perceptions towards people who are either underweight, normal or overweight. More than half (56.8%) had an accurate perception about people who are overweight or obese as indicated in Table 2. Also 51.6% had an accurate perception of people who are underweight by identifying them as not healthy and being physically inactive. It seems to be a recent change on how young traditional Ghanaians perceived themselves. The cause of this change is explained in the study of [12] to be as a result of exposure to more opportunities for social comparison and consultant surveillance of body parts through online resources which consequently expose them to different cultures and perspectives. This could have had an influence or impact on young person's perception of their body weights.

In addition to the cause of this sudden change in weight perception. Author [14] mentions in their study that, it is as a result of recent political and economic progress in Africa that has altered body weight perceptions among young Africans. Generally, the mean BMI of the respondents in this study is 23.9kg/m² this indicates that the study population in general had normal weight. Results from Table 10 indicates that majority of the respondents perceived themselves to have a normal body weight (80.8% had normal body size). Hence the perceived body weight of the respondents was a true representation of their actual body weight status. This finding corresponds to the studies of [3], [4] and [12]. However, the above accurate perception of young adults in the tertiary institutions is inconsistent with other studies including the studies of [15]. This study identified discrepancy between perceived weight status and actual weight, a phenomenon known as weight misperception. The accurate concordance of weight perception and nutritional status could be as a result of the respondents' level of education. The appreciably high (34.0%) number of the respondents who were either overweight or obese as shown by the study findings, is consistent with other studies which indicates the gradual increase in the number of children and adults who are becoming overweight as stated in the study of [2].

The major finding of this study proved that perception of weight is a better predictor to actual weight status (BMI) of students which determines the type weight management to engage in. The misperception of body weight was higher in the underweight and overweight or obese categories. The underestimation of body weight was higher among those who perceived themselves to be underweight [16]. But only 13.6% were actually underweight and 70.6% had their nutritional status to be normal. If individuals' perception of their body weight does not correspond with ideal weight, they are at risk of being dissatisfied with their weight and therefore it may lead to a sense of discomfort and bodily concern [17] (Werner, 2013). In this section weight perception was specifically found to be a predictor of nutritional status of student which reflected in the study area. Therefore, the relationship between body weight perception and nutritional status was statistically significant ($p < 0.05$). Hence there was positive association between body weight perception and nutritional status, most of the students had accurate weight perception and their nutritional status to be a true reflection with WHO standard of measurement.

CONCLUSION

The study constituted both males (51.6%) and females (48.4%) from the three tertiary institutions: TaTu, BACE and TACE in the Sagnarigu municipality. The present study showed a very high prevalence of accurate concordance of weight perception and nutritional status among the tertiary students in the selected institutions. Majority of the respondents perceived themselves to have a normal weight which turned-out to be the true reflection of their BMI indicating their nutritional statuses. Most of the students did not perceive obesity or being overweight to be an ideal body status, indicating a recent change on how traditionally Ghanaians perceived themselves. Also, the respondents were found to have an accurate perception about underweight, overweight or obese people by identifying them as not being healthy and being physical inactive. Social media was the leading factor that influenced student's bodyweight perception while most students had no knowledge of their weight. Forty-seven percent (47%) of the students were actually terrified about their current weight.

Recommendations

1. Ghana Health Service should increase campaign for regular health checkups. This would promote accurate knowledge and perception about peoples' perception on their weight status and prevent unhealthy weight management practices and weight related problems.
2. Information on good dietary habits and practices should be increased via the media and other educative programs by Ghana Health Services, Ghana Education Service and other stakeholders.

3. School authorities should put appropriate measures in place to promote and increase physical activities in their various institutions.

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