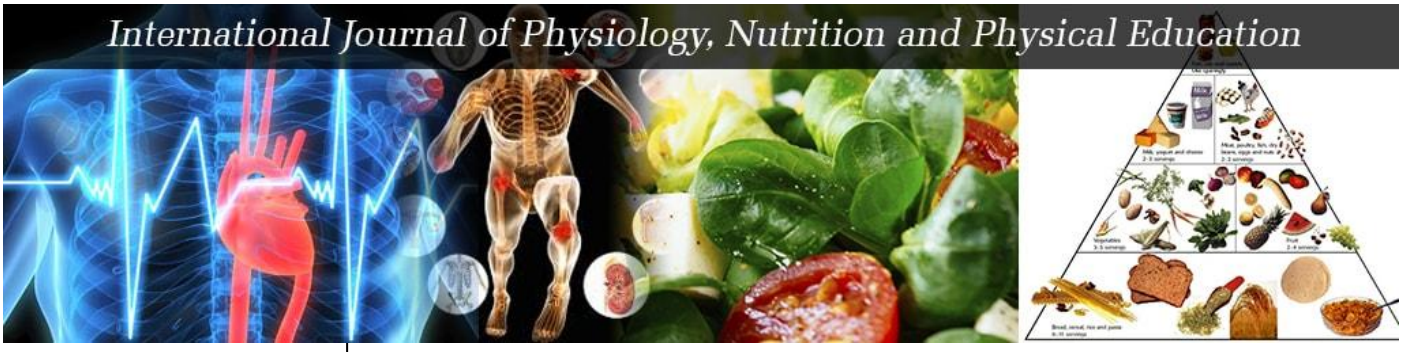

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Shabnam Joshi
Assistant professor, Department of physiotherapy, GJUS&T, Hisar, Haryana, India

Alka Pawalia
Assistant Professor, Department of physiotherapy, GJUS&T, Hisar, Haryana, India

Bharti Kundu
Under Graduate student, Department of physiotherapy, GJUS&T, Hisar, Haryana, India

Vikram Singh Yadav
Assistant Professor, College of Physiotherapy, Pt. B.D. Sharma University of health sciences, PGIMS, Rohtak, Haryana, India

Correspondence
Alka Pawalia
Assistant Professor, Department of physiotherapy, GJUS&T, Hisar, Haryana, India

Relation of body image with BMI among female university students

Shabnam Joshi, Alka Pawalia, Bharti Kundu and Vikram Singh Yadav

Abstract
Youngsters today are self-conscious and more focused about their looks and appearance. Also childhood obesity is common and prevailing leading to various associated problems in young people. The present study was done on 160 females (18-25 years) to see a relationship between Body Mass Index (BMI) and body image amongst university female students. Body image was measured using a standard questionnaire. The results showed that 27.75% and 35% of girls were overweight and obese. Also, there was a significant positive correlation of body image with increasing BMI ($p<0.01$). There was a significant positive correlation of BMI with waist and hip circumference too ($p<0.01$). The present study concludes that 58.7% females were overweight and obese, which is a very high figure and also not good for their health and it may lead to several problems. It also shows that young girls become increasingly more conscious of their body image as their BMI increases. Young girls should be advised to maintain a healthy weight and BMI to prevent associated problems and to have a better future health.

Keywords: BMI, obesity, body image, youngsters

Introduction
Overweight and obesity are linked to more deaths worldwide than underweight. Generally, obesity is caused by sedentary life style physical inactivity, unhealthy diet and wrong eating habits. A child is considered as obese if they have an increased weight by at least 10 percent of what is normally recommended for their age, height and body type. Young children in the age group of 5 and 6 or adolescents are the most commonly affected with obesity when it generally begins in them. It is also reported that the chances of an adult becoming obese are 80 percent more if he or she was obese at 10 to 13 years of age [1, 2].

Obesity is associated with many adverse effects and complications. Risk factors which are physical are like raised blood pressure, increased heart disease risk, diabetes, respiratory problems, sleeping issues, hormonal imbalances to musculoskeletal pains and aches.

This childhood obesity is also associated with various emotional changes leading to full blown physical problems. Peer pressure to be more popular amongst teenagers and associated low self-esteem due to obesity are most commonly reported beliefs. These could eventually lead to problems of depression, anxiety and various obsessive compulsive disorders [3].

Excess weight gain is seen when there is an imbalance between the body's requirement and the intake one has. More energy foods and drinks are good for a youngster provided it is adequately used by various physical activities, healthy functioning, growth which is required at this age. If it is not so, it will add to the weight eventually leading to obesity. It is encouraged to maintain a healthy balance between the calorie intake and its utilization to have a normal growth and development without gaining excess weight in children by American Dietary Guidelines. This is so as in United States, energy imbalance is the main factor behind high obesity rates and also globally [4].

Factors like genetics and metabolism could also contribute to childhood obesity. Also a body's capacity to change food and oxygen into energy, sleeping patterns with less duration sleep, community, safety assurance, dietary and physical activity patterns also influence childhood obesity [5, 6].

However, it is difficult to change the genetic factors, but family, community, people and places can help in the same.

Organizations like school, out of school programs, health providers, religious groups, faith groups, some government agencies, social media, companies related to food and beverage, entertainment industries can all help in forming or deforming the daily food and fitness behaviors of youngsters.
Certain environmental changes in places where children spend their time like schools, home and community can help a child in achieving healthy weight and also maintain it for the long run more easily. Policies in school to add fruits and vegetables in diet can be included. Also a 60 minutes of mandatory physical activity session on a daily basis along with avoiding certain food items which are rich in high calories due to sugars and solid fats need to be eliminated from daily meals [7].
Focusing on weight management programs, changes in eating patterns with slow eating habit and sticking to a routine habit, planned meals and improved food selection i.e. focusing on less calorie and high fiber diet are certain other ways to manage obesity. Having controlled portion size, less calorie food, knowing what your child actually eats at school and increased physical activity in daily life are few other ways to manage obesity.
If not handled at the right time obesity can become a lifelong issue. Most of the children return to their old diet and exercising habits eventually gaining their lost weight back. Parents too can help an obese child by focusing more on their strengths and positive qualities so as to improve their child's self-esteem, than solely on their weight [8]. Now a day's people want a good physical profile but for that they are not doing physical activity and which may lead to several problems in future.
The primary aim of the present study is to find any relation of body image with BMI among female university students and to find out the level of stress in female university students.

2. Methodology
This study was done on a convenience sample of 160 university female students in the age group of 18-25 years in Hisar. Students having any lifestyle disease like diabetes, hypertension and those who did not give their consent for the study were excluded. They were measured for age, weight, height, BMI, waist and hip circumference, their body image perception by a standard questionnaire. These were measured as follows:

Weight measurement:-Electrical weighing machine was used for measurement of weight and before subjects were allowed to stand on it (with shoes off). It was taken care that the female stood straight leaving proper gap between the feet and measurement were taken with minimum clothing.

Height measurement:-Measuring tape was used for measuring height. Subjects were asked to stand with feet close together and head straight, eyes looking forward and both shoulders were in level and keeping the spine straight measurement was taken using a scale.

BMI:-It is calculated by weight in kilograms divided by square of height in meters. It is the most common method used to express overweight obesity.

Waist Circumference:-Using the measuring tape, WC measurement was taken at the level of umbilicus.

Hip Circumference:-Using the inch tape, measurement was taken at the level of widest part of buttocks.

BSQ (Body Shape Questionnaire):-Long form. It is a self-reporting measure of the body shape. The scoring is between 1-6 and in this 1 is never and 6 are always. Score less than 80 shows no concern with shape with score but 80-110 means mild concern 111-140 means moderate and more than 140 means marked concern about shape.

3. Data analysis
Demographic data is presented in mean and standard deviation. Further data was classified according to BMI group and presented in mean and standard deviation along with percentages.
Normality was checked for variable using Kolmogorov-Smirov test for BMI and BSQ. Spearman correlation was used to find correlation between BMI and BSQ.

4. Results
This table shows the mean age of the subjects was 20.8±1.59, mean weight of the subjects was 55.27±8.20, mean waist circumference of the subjects 76.65±2.59, mean hip circumference of the subjects was 84.63±2.99, mean BSQ of the subjects was 74.47±27.60 and mean BMI of the subjects was 23.87±3.47.

Table 1: Demographic data of the study participants

Demographic data	Mean ± SD
Age (Years)	20.8±1.59
Weight (kg)	55.27±8.20
Waist Circumference (cm)	76.65±2.59
Hip Circumference (cm)	84.63±2.99
BSQ	74.47±27.60
BMI (kg/m²)	23.87±3.47

Table 2: Comparison among the subjects according to BMI.

BMI	No. of subject	
<18.5	8 (5%)	Under weight
18.5-22.9	58 (36.25%)	Normal
23-25	38 (27.75%)	Overweight
>25	56 (35%)	Obese

Out of 160 girls 58 were Normal followed by Obese (56), overweight (38) and Underweight (8) respectively.

Table 3: Comparison of study variables in Underweight, Normal, Overweight and Obese among the subjects.

Variable	Underweight	Normal	Overweight	Obese
Waist circumference	68.43	73.44	77.89	80.35
Hip circumference	75.93	80.25	85.39	88.30
W/H ratio	0.90	0.91	0.91	0.91
BSQ score	55	59.793	76.631	91

Table 4: Shows correlation between study variables

Variable	r	Significance
BMI vs. BSQ	0.579	0.000
BMI vs. WC	0.616	0.000
BMI vs. HC	0.607	0.000

Correlation is highly significant * at the 0.01 level

5. Discussion
Several studies have been done in different populations to assess the prevalence of overweight and obesity in different age groups in developed countries but in developing countries like India, very little work has been done till now. It is necessary to restrict the problem associated with the overweight and obesity which can become a great problem in

future.

According to Shukla *et al* in 2016 a study was conducted among adolescent and they found that the overweight and obesity in adolescent ranged from 2.2 to 25.8% and 0.73 to 14.6% respectively. The prevalence was comparatively higher in urban areas than in rural areas [9].

The aim of the present study is to find out the relation of body image with BMI among female university students. In this study the mean percentages of normal BMI were 36.25% followed by obese 35%, overweight 23.57% and underweight 5% respectively. The results of the present study showed that the mean BMI is 23.87kg/m² and it indicated that overall girls are heading towards being overweight.

Thus, the increasing prevalence of obesity among University female students can become a major problem in future and can lead to various disorders like, hypertension, stroke, cardiovascular problems, respiratory problems, sleep apnoea, diabetes, arthritis, and depression.

The factors supposed to be the cause of this increasing prevalence of overweight and obesity are due to reduced physical activity, people shifting more to fast foods, presence of latest technology instruments for work making life easier and comfortable, increase in T.V watching hours by the children, consumption of high calorie foods. Obesity can be due to genetic and endocrine disorders too.

According to Gobbur *et al* in 2016 a study was conducted to find the prevalence of stress among post graduate doctors. Stress, anxiety, worry, aggression have all increased significantly in recent years. The majority of 61.94% of the study subjects belonged to 26-30 years of age groups and stress level is more common in the age group of 20-25 years i.e.39.34%. Majority 58.94% were males. 1st years post graduates experienced more stress 36.94% whereas 67.16% belonged to clinical side and more stress level was found in them. 65.03% stress level is found in unmarried postgraduates. Stress level was found to be more 35.90% among post graduates who were having 4-6 hours of sleep per day whereas 25.43% who worked for 6-10 hours per day [10].

The present study showed that greater stress was seen in Underweight (23.25%) female students followed by Overweight (22.92%), Obese (22.78%) and Normal (21.51%) respectively. This shows that underweight have more stress as compared to other weight categories.

Thus, the increasing prevalence of stress among university girl students can become a major problem like obesity, heart diseases, Alzheimer's disease, diabetes, depression and asthma [11].

A study was conducted by Banjade B, Naik VA and Narasannavar in 2014 among adolescents of North Karnataka, India to find the prevalence of Body weight perception. Body Image is the factor that determines how adolescents feel about themselves. It was reported that 13% and 11.2% of participants underestimated and overestimated their body weight. Those who considered themselves as normal for age, height and weight were 82.7%, while 7.6% perceived themselves as underweight and 9.7% as overweight or obese. This study concluded that youngsters inappropriate perception about their weight results in increased problems of overweight and obesity among youngsters [12].

The present study showed that girls who were concerned about their shape were obese followed by overweight, normal and underweight girls respectively. This concern could result in stress eventually leading to obesity trigger. Lack of knowledge about and access to growth charts has probably made difficult for adolescents to evaluate their weight status objectively. So, to prevent the above problems of obesity adequate knowledge regarding obesity and proper awareness should be developed among the society and preventive measures should be taken to overcome the obesity problem. To overcome the stress people should do mediation, go for a yoga class as yoga is good for health, a good belly laugh lightens the load of stress.

Less satisfaction with body image which leads to stress and it may further leads to obesity. For this, female students should go for walk and intake of a proper diet to reduce the chances of diseases in future.

6. Conclusion

The present study concludes that 58.7% females were overweight and obese, which is a very high figure and also not good for their health and it may lead to several problems. BSQ results showed more obese subjects are less satisfied with their body image i.e. obese subjects are more concerned about their shape. High stress level was seen in underweight female subjects. Hip and Waist circumference was more in obese. Obese females seemed to be more concerned about their body shape than others.

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