Prevalence of Joint Pain Episodes and Association of BMI with Body Weight Perception in Young Adults: A Prospective Study

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Abstract

Objective: To establish whether college going males and females having normal body mass index perceive themselves as normal and are satisfied with their body image perception and to know prevalence of the joint pain episodes in them. **Materials and Methods:** Database was collected from population of 200 people including 100 girls and 100 boys between the age group of 18- 25years of age by stratified purposive random sampling in North Delhi. Subjects were informed about filling up of the questionnaire, they were provided with instruction to fill that on consenting to participate. **Results:** The frequency of self perception differed significantly (p<0.001) between the two genders. Also, frequency of joint pain episode was significantly (p<0.05) different. **Conclusion:** It is thus concluded that gender differences related to perceived weight related to BMI are consistent among young adults. Females are most likely to perceive themselves as too fat or little fat while males perceives themselves as too thin or a little thin despite of having a normal BMI. Also frequency of joint pain episodes are higher in females than in males. Findings of present study are expected to contribute to obesity and body image concern research by underscoring the importance of sociocultural influences of shaping realistic body image and having implications for prevention and early intervention for establishing healthy behavior pattern during adolescence.

Keywords: BMI; Body image; Joint pains; Weight perception.

Introduction

The growing rate of obesity among children and adults is a global health concern. High levels of overweight population affects the country.Corresponding to this trend, large proportion of population is unsatisfied with their extra pounds and trying to loose them. In addition to actual weight perceived weight status is an important determinant of eating and weight loosing behavior.[1]

Perceived weight does not always reflect actual weight status based on BMI{body mass index}. This is a concern, as inappropriate weight perception can lead to unhealthy behavior including eating disorders, and excessive physical workouts leads to musculoskeletal problems. Universities and colleges on other hand, represents opportunities for reaching large numbers of students to promote appropriate weight perception and healthy eating behavior.[2,3]

Actual weight perception may be influenced by food habits and food environment, nutritional environments, nutritional knowledge, physical workout, cultural norms and expectation and mass media depiction of what constitute an ideal figure, in addition to lifestyle difference that affects physical activities.[2,3]

Obesity and malnutrition pose a major risk of chronic disease including type-2 diabetes, cardiovascular disease, hypertension, hypotension, stroke and certain types of cancer.

Body image is an important element of the intricate mechanism of one's own density.

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Gardener defines it as "the mental picture we have of our body measure, contour and shape, and are freely related to those characteristics and to our body part.[4]

The subjective component of body image refers to one's satisfaction with their own body size. Sociocultural environment seems to be an important variable in the level of distortion and subjective body image disorders.[5]

Identifying and measuring the magnitude of body image self perception distortion would be relevant for clinical evaluation of those individuals who are at risk of obesity or becoming malnutrition. The assessment of body perception in relation with weight status is important in order to understand likelihood of an individual to get involved in healthy behavior.

The chronic intake of energy below the level of expenditure induces rapid loss in body weight and muscle mass accompanied by profound changes in physiology and behavior. Together these causes starving person to become weak, apathic, depressed and unable to work productively and these changes are more evident in gastrointestinal system, skin, blood cells, nervous system and musculoskeletal system. Skin lesion, malabsorption, indigestion, anemia, neurological or behavioral changes and of special concern, the loss of immune responses, accompanies severe malnutrition.[2,3,6]

The term 'body image' refers to the picture of our own body which we form in our mind—in its physiological, libidinous, and sociological aspects.Body image distortion occurs when a person's views about his or her body are significantly different from reality.[7]

Many factors impact the perception of one's own body image including media, peer group, ethnic group and family values8.The disparity between height and weight leads to problem with self esteem when one feels that he or she is not meeting the demands of ideal body shape and size. Anorexia nervosa and bulimia cause dramatic weight fluctuation and interfere with normal life and cause damage vital bodily functions.[9]

Body Mass Index

One of the methods for statistical measure of body weight is BMI (body mass index). BMI provides a simple numerical value which is the measure for person's fatness or thinness allowing health professionals to discuss over and underweight problems more objectively in the patient. According to the WHO guidelines, BMI = weight(kg)/ height(m)2 where Underweight = <17, Normal = 17-25, Overweight = 25-30 &Obese = >30.[10]

So the following study was taken up to establish whether college going males and females having normal body mass index perceive themselves as normal and are satisfied with their body image perception and to know prevalence of the joint pain episodes in them.

Materials and Methods

Database was collected from population of 200 people including 100 girls and 100 boys between the age group of 18-25 years of age by stratified purposive random sampling in North Delhi. Questionnaire was made to fill by the subject, on consenting to participate. Only the subjects who met the inclusion criteria i.e. Mesomorphs at site and a BMI of 17-25kg/m2,males and females of Age 17 to 25 and unmarried were selected for the study. Subjects diagnosed of any pathology/disorder, undergoing hormonal therapy, psychologically impaired and having any chronic disorder were excluded from the study. A standard and calibrated digital weighing machine scale certified by ISO 9001:2000 was used and weight was measured to the nearest 100th gram. A non-stretchable measuring tape was used to measure height to the nearest 0.5 cm.

The subjects were asked to fill the questionnaire and their body mass index was measured from the data obtained. Males and females were compiled separately.

Three separate models with dichotomous

responses were employed.

1. Just right

2. too much thin or little thin

3. too much fat or little fat

The weight was calculated in kilograms and height in meters and BMI as calculated in kg/m2 was compared with student's own perception about their body size.

The questionnaire consisted of few questions which was used to assess the perception of the person, any joint pains reported, physical activeness, diet pattern and any problem related to that and the demographic data of the individual.

Statistical Analysis

Continuous data were summarized as Mean ± SD while discrete (categorical) in %. Continuous groups were compared by independent Student's t test while categorical groups were compared by chi square (÷2) test or Fisher's exact test. A two-sided (á=2) p<0.05 was considered statistically significant.

Results

The basic characteristics of two gender groups are summarized in Table 1. The mean age of two groups were similar (p>0.05). However, the mean height, weight, and BMI of males were significantly (p<0.001) different and higher as compared to females. The frequency of self perception differed significantly (p<0.001) between the two genders withfrequency of LF and TMF being significantly higher in females as compared to males while TMT, LT and JR were significantly higher in males as compared to females. The actual perception (i.e. perception according to BMI) did not differ (p>0.05) between the two groups. However, frequency of joint pain episode was significantly (p<0.05) different and higher in females as compared to males.

The association of actual perception with self perception between the two gender groups is summarized in Table 2. Table 2 showed that the self perceptionsdid not differ between the two genders when compared to actual perception "under weight" and "over weight" while differed significantly (p<0.001) when compared to actual perception "normal weight". According to actual perception "normal weight", the frequency of self perception LT (7.4% vs. 40.7%, p<0.001) and JR (12.3% vs. 26.4%, p=0.021) were

Table 1: Basic Characteristics (Mean ± SD) of Two Groups

Characteristics	Females (n=100)	Males (n=100)	p value
Age (yrs)	21.26 ± 1.69 (18-25)	20.96 ± 2.09 (18-25)	0.265
Height (cm)	160.71 ± 4.42 (152-173)	171.04 ± 6.87 (157-190)	p<0.001
Weight (kg)	54.45 ± 6.39 (45-71)	64.97 ± 7.23 (47-90)	p<0.001
BMI (kg/m²)	21.08 ± 2.30 (17.63-28.80)	22.19 ± 1.95 (17.28-28.41)	p<0.001
Self perception:			
TMT	0 (0.0%)	5 (5.0%)	
LT	8 (8.0%)	38 (38.0%)	
JR	14 (14.0%)	27 (27.0%)	p<0.001
LF	69 (69.0%)	28 (28.0%)	
TMF	9 (9.0%)	2 (2.0%)	
Actual perception:			
Under weight (BMI: 16.00-18.49 kg/m²)	10 (10.0%)	3 (3.0%)	
Normal weight (BMI 18.50-24.99 kg/m²)	81 (81.0%)	91 (91.0%)	0.084
Over weight (BMI:25.00-29.99 kg/m²)	9 (9.0%)	6 (6.0%)	
Joint pain episode:			
Yes	19 (19.0%)	7 (7.0%)	0.019

Numbers in parentheses indicates the range (min–max)

Table 2: Association of Actual Perception with Self Perception between Two Groups

Actual perception	Gender	Self perception					p value
		TMT	LT	JR	LF	TMF	
Under weight (n=13)	Females (n=10)	0 (0.0%)	1 (10.0%)	4 (40.0%)	5 (50.0%)	0 (0.0%)	0.284
	Males (n=3)	1 (33.3%)	0 (0.0%)	1 (33.3%)	1 (33.3%)	0 (0.0%)	
Normal weight (n=172)	Females (n=81)	0 (0.0%)	6 (7.4%)	10 (12.3%)	57 (70.4%)	8 (9.9%)	p<0.001
	Males (n=91)	4 (4.4%)	37 (40.7%)	24 (26.4%)	24 (26.4%)	2 (2.2%)	
Over weight (n=15)	Females (n=9)	0 (0.0%)	1 (11.1%)	0 (0.0%)	7 (77.8%)	1 (11.1%)	0.244
	Males (n=6)	0 (0.0%)	1 (16.7%)	2 (33.3%)	3 (50.0%)	0 (0.0%)	

Table 3: Distribution of Misperception between Two Groups

Actual perception	Gender	Self perception		p value
		Correct	Incorrect	
Under weight (n=13)	Females (n=10)	1 (10.0%)	9 (90.0%)	0.423
	Males (n=3)	1 (33.3%)	2 (66.7%)	
Normal weight (n=172)	Females (n=81)	10 (12.3%)	71 (87.7%)	0.023
	Males (n=91)	24 (26.4%)	67 (73.6%)	
Over weight (n=15)	Females (n=9)	8 (88.9%)	1 (11.1%)	0.235
	Males (n=6)	3 (50.0%)	3 (50.0%)	

significantly (p<0.05 or p<0.001) lower while LF (70.4% vs. 26.4%, p<0.001) and TMF (9.9% vs. 2.2%, p=0.032) were significantly (p<0.05 or p<0.001) higher in females as compared to males.

Assessing the misperception, the self perception were further sub grouped in three groups by considering "TMT + LT" as "under weight", JR as "normal weight" and "LF + TMF" as "over weight" andthe frequency were then compared with actual perceptions (under weight, normal weight and over weight) and summarized in Table 3. The misperception under weight was higher in females as compared to males but not differ statistically (90.0% vs. 66.7%, p=0.423). In contrast, the misperception overweight weight was higher in males as compared to females but also not differ statistically (11.1% vs. 50.0%, p=0.235). However, the misperception normal weight differed between the two genders and significantly (p<0.05) higher in females as compared to males (87.7% vs. 73.6%, p=0.023).

Discussion

The present study was taken up to establish whether college going males and females having normal body mass index, perceive themselves as normal and are satisfied with their body image perception & prevalence of the joint pain episodes in them.

In a study done almost 2 decades earlier, Dwyer, J.T. Feldman & Mayer J. studied 446 females of senior high school and anthropometric measurements were taken to determine the body fat levels. 37% of girls reported that they were on a diet on the day of their interview, while 61.4 % reported that they had dieted sometime in their lives. However , only 15 % of the girls were found to be obese. When asked that most important reason for dieting, 43 % were concerned with beauty and good looks. It is also important to note that this study was done long before the widespread introduction and use of diet soft drinks and diet food like Lean Cuisine.[11,12]

The data obtained from present study also confirms that, perception of body image in young adults do not coincide with desired body type. Two different tendencies emerged: while the girls aim for longer, slimmer body shape, boys in general, apart from having

Richa Rai *et al* / Prevalence of Joint Pain Episodes and Association of BMI with Body Weight Perception in Young Adults: A Prospective Study

41

sometimes felt overweight unlike their female peer, feels too thin.

This appearing contradictive view can be explained by the fact that boys like to have robust and muscular constitution. Amongst the 200 subjects taken, 179 had normal BMI. But there is large difference between the perceived body image and habits among the individuals of both gender groups. As from the results we can conclude that, both young males and females have altered perception about their body weight. This can produce harmful effects to the individuals both mentally and physically as supported by a study done by Isomaa, Rasmus in 2011 where they have concluded that an incorrect perception of being underweight was more prevalent than an incorrect perception of being overweight among adolescent males, and that this incorrect perception was related to social anxiety and that eating disorders are common among adolescent females and rare among adolescent males.[9]

Some previous studies have suggested that the ideal BMI for female attractiveness preferred by women is significantly lower than that preferred by men.[13] Most of the females, even though having normal BMI, have a tendency to adopt comparatively more numbers of strategies to reduce weight. From the data calculated in our study also, the frequency of self perception differed significantly (p<0.001) between the two genders with frequency of LF and TMF being significantly higher in females as compared to males while TMT, LT and JR were significantly higher in males as compared to females. Also it has been observed that according to actual perception "normal weight", the frequency of self perception LT (7.4% vs. 40.7%, p<0.001) and JR (12.3% vs. 26.4%, p=0.021) were significantly (p<0.05 or p<0.001) lower while LF (70.4% vs. 26.4%, p<0.001) and TMF (9.9% vs. 2.2%, p=0.032) were significantly (p<0.05 or p<0.001) higher in females as compared to males. This situation can affect females more intricately and plays an important role in health related problems. Anorexia nervosa can be one of

them- a " nervous loss of appetite" reflecting preoccupation with dieting and thinness and refusal to eat enough food to maintain normal body weight.[4]

On the other hand, in contrast, the misperception overweight, weight was higher in males as compared to females but also did not differ statistically (11.1% vs. 50.0%, p=0.235). This again may pose as an upcoming problem in young male adults9, due to excessive eating there could be bulimia like features like "ox hunger", binge eating like characteristics, where the person consumes calorically dense food within several hours, followed by intense feeling of guilt.[4] Cardiovascular problem may occur due to this tendency of overeating. Study suggested that adolescent with excessive perception of weight are more likely to adopt unhealthy behaviors or manipulate the consumption of certain of food stuffs. This discomfort with one's body image within population cannot have anything but obvious repercussion in life.

Lautman M. in 1991, had studied that the mass media's portrayal of the thin, ideal female body is well documented. Advertisers explicitly target the body image of women in the marketing of food and exercise products and the effects of this practice were just beginning to be explored in that decade by other researchers also viz Kaltenbach,1991.[12] The trend continued and further stated by other researchers vizStice, Schupak-Neuberg, Shaw, Stein in 1994 also that the increasing number of articles and advertisements promoting diet, weight-control and fitness coexists with the systematic decrease of satisfaction with one's own body image.[14]

Another research was conducted in Poland and included several groups of participants i.e 13-14 year old pupils, and the data they collected supported women's dissatisfaction with their body image and different ideal body images among female groups. The results seem to be very important for the explanation of the mechanism of development of eating disorders. As studied by them and other

authors viz Silverstein, Perdue, Peterson & Kelly in 1986 and Myers &Biocca in 1992, media presented an unrealistic or idealised picture of physical attractiveness Every day, women were informed that they should eat very little and be slim. Extremely thin top models, became a representation of the ideal standard & objects of comparison for many young women. Very often they were also not conscious that photographs they found in women's magazines were manipulated and they believed that their appearance should be similar to that of the models. In this way a cult of unreal beauty is created as studied by Marzano-Parisoli,2001.[15,16]

It is thus concluded that gender differences related to perceived weight related to BMI are consistent among young adults. Females are most likely to perceive themselves as too fat or little fat while males perceives themselves as too thin or a little thin despite of having a normal BMI. Also frequency of joint pain episodes are higher in females than in males.

Findings of present study are expected to contribute to obesity and body image concern research by underscoring the importance of sociocultural influences of shaping realistic body image and having implications for prevention and early intervention for establishing healthy behavior pattern during adolescence. This helps to figure out the basic tendencies among males and females regarding their body image and all practices related to modify their body image which unknowingly can harm them. Steps to carry out adequate and urgent measures of an informative education in order to prevent further dramatic development in this area, through systematic intervention for prevention and treatment, based on concrete knowledge is required as it has been observed that the misperception normal weight differed between the two genders and significantly (p<0.05) higher in females as compared to males (87.7% vs. 73.6%, p=0.023).

Conclusion

It is thus concluded that gender differences related to perceived weight related to BMI are consistent among young adults. Females are most likely to perceive themselves as too fat or little fat while males perceives themselves as too thin or a little thin despite of having a normal BMI. Also frequency of joint pain episodes are higher in females than in males.

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