

# Body Image Satisfaction and Its Association with Physical Activity and Body Mass Index among Health Students from Surakarta, Indonesia

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**Abstract:** Purpose: Dissatisfaction with body shape and size raises the desire to be thinner or fatter. The desire to achieve ideal body weight makes someone regulate eating patterns and physical activities. School life (time as a student) is a time when a person switches from adolescence to adulthood. At this time, a person experiences changes that can affect health. Health students have knowledge about eating patterns and recommended physical activities. This study aims to look at body image, physical activities and nutritional status in health students. Method: This cross sectional study recruited 120 health students. Perception of body image is assessed using a figure rating scale consisting of nine silhouettes of body shape. Participants were asked about body shapes that describe themselves and their ideal or desired body shape. Physical activity was measured using an international physical activity questionnaire. Results: Most of the participants wanted normal weight as an ideal shape. The majority of participants (75.83%) experienced body image dissatisfaction and 29.17% experienced body image distortion. Body image dissatisfaction was not related to physical activity ( $p > 0.05$ ). Most participants (48.3%) had moderate levels of physical activity. The level of physical activity is related to body mass index. Conclusion: most participants were not satisfied with the shape of their bodies. Body image dissatisfaction is not related to physical activity, but physical activity is related to nutritional status.

## 1 INTRODUCTION

Body image is a picture of our mind about the size and shape of our body and our feelings about the characteristics of these limbs (Tomas-aragones and Marron, 2016). Student's body image, especially women is formed due to the influence of family and peer environment, adolescents tend to compare their body shape with relatives or peers (Mase et al., 2015). Exposure to social media and electronic media also has an influence on the formation of body image in female students (Sai et al., 2018). The description of body shape and body size makes someone feel satisfied or dissatisfied with body shape (Coelho et al., 2016). Body image will affect a person's eating behavior and physical activity so that she gets the desired body shape. Dissatisfaction with body shape increases the risk of eating disorders and increases physical activity (Prioreshi et al., 2017).

Physical activity refers to all body movements that are produced by skeletal muscle and require

energy (WHO | Physical Activity, 2017). Countries with low average levels of physical activity have a greater obesity prevalence (Althoff et al., 2017). Some affect the physical activity of a person, namely psychobiology, culture, society, availability of choices, lifestyle, behavioral regulation, proximal influence and distal influence (Booth et al., 2001).

The level of physical activity is related to a person's body mass index. Active men have a lower risk of obesity compared to those who are less active (Lee et al., 2016). A high level of activity in a person decreases the risk of being overweight in both men and women (Štefan et al., 2017). Research on Italian students shows the longer physical activity, the lower the BMI in men and fat free mass in women (Zaccagni, Barbieri and Gualdi-Russo, 2014). WHO recommends moderate to heavy physical activity for 150 minutes a day, but very few students do physical activity according to WHO recommendations (Štefan et al., 2017).

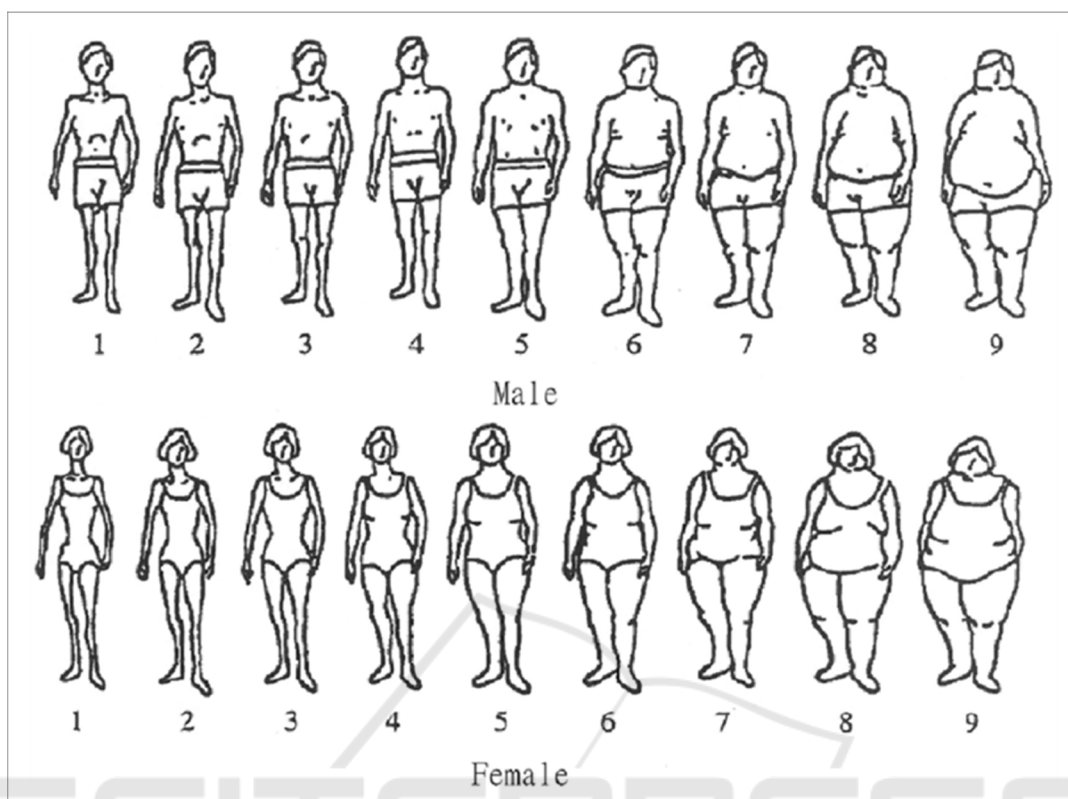


Figure 1: Figure Rating Scale

## 2 METHODS

The cross sectional survey was conducted on 120 health students majoring in nutrition, nursing, medical, and occupational health and safety students. The survey was conducted in May 2019. The research subjects were also asked about how much they slept in one day.

### 2.1 Anthropometric Assessment

Anthropometric measurements are carried out using the following procedure: body weight is measured using a digital weight scale with an accuracy of 0.1 kg. Height is measured by microtoise with a level of accuracy of 0.1 cm. Body mass index (BMI) is measured by weight divided by height squared. Participants were divided into 4 groups: under weight with BMI <18.5, Normal weight with BMI 18.5 - 22.9, over weight with BMI 23 - 24.9 and obese > 25.

### 2.2 Body Image Perception

Body image perception is assessed using the figure rating scale (FRS) developed by Stunkard et al. The rating scale figure consists of 9 silhouettes that illustrate 9 body shapes. No. 1 is the thinnest body shape and No. 9 is the biggest. Subjects were asked to mark the body shape that describes themselves (perceived body size) and the body shape they want (ideal body size). Body shape satisfaction is assessed through the difference between perceived and ideal body size. A zero score indicates bodily satisfaction, a negative or positive score indicates body image dissatisfaction. A negative score indicates a desire to gain weight and a positive score indicates a desire to lose weight.

Body image distortion is assessed through differences in perceived body size with actual body size based on the BMI category. A zero score indicates an undistortion body image while a negative or positive score indicates a body image distortion. The numbers on the scale of body image perceptions (perceived or ideal) were also classified according to standard procedures [25, 26] into four groups: 1 and

2 underweight; 3 and 4 normal weight; 5-7 overweight; and 8 and 9 obese shape.

### 2.3 Physical Activity

Physical activity was measured using the International Physical Activity Questionnaire (IPAQ). Research subjects were interviewed about their activities and intensity over the past 7 days. Activities interviewed included activities during college, activities at home, and leisure activities. The level of physical activity was then divided into 3 groups, namely low, moderate and high. Low if the physical activity carried out does not meet the criteria of medium and high categories. Moderate if Doing heavy physical activity for at least 3 days for 20 minutes / day or doing moderate level physical activity or walking for at least 5 days for 30 minutes / day or doing a combination of heavy and moderate physical activity and running for 5 days and accumulated a minimum of 600 MET / week. High Doing Heavy Activities for a minimum of 3 days and accumulating a minimum of 1500 MET / week or walking, doing moderate and heavy physical activity for 7 days and accumulated a minimum of 3000 MET / week.

### 2.4 Statistical Analysis

Data were analyzed using Statistical Package for Social Science (SPSS) version 24. Pearson's Chi-square test was used to compare physical activity

between different groups of body size satisfaction or to compare body mass index categories in different physical activity groups. P values less than 0.05 were considered as significant.

## 3 RESULTS

A total of 120 health students with mean age of 19.28 were recruited to join this study. BMI mean is 22.4 (table 1). Table 2 shows the distribution of subjects based on body shape perception, 64.7% of subjects have the correct body image based on BMI. The form should be completed and signed by one author on behalf of all the other authors.

Table 1: Characteristic of participants

Variables	Mean $\pm$ SD
Age (year)	19.28 $\pm$ 0.67
Weight (kg)	55.25 $\pm$ 13.6
Height (cm)	156.7 $\pm$ 6.25
BMI (kg/m <sup>2</sup> )	22.42 $\pm$ 5.02
Sleeping Hours	7.44 $\pm$ 1.36

Most participants (86.64%) desire normal body shape (fig 3,4) as an ideal body shape. The prevalence of body image dissatisfaction is 75.83% with 50% wanting to lose weight. The prevalence of participants who experienced body image distortion amounts to 29.17% and mostly experienced by obese subjects.

Table 2: Participants distribution by perceived body image

BMI (Kg/m <sup>2</sup> )	Perceived Body Image			
	Under weight (fig 1,2)	Normal weight (fig 3,4)	Over weight (fig 5,6,7)	Obese (fig 8,9)
Under weight (n = 26)	14 (11,67%)	12 (10%)	0 (0%)	0 (0%)
Normal weight (n = 56)	2 (1,66%)	53 (44,17%)	1 (0,83%)	0 (0%)
Over weight (n = 14)	0 (0%)	6 (5%)	8 (6,67%)	0 (0%)
Obese (n = 24)	0 (0%)	5 (4,17%)	17 (14,17%)	2 (1,66%)

Table 3: Ideal body image according body mass index

BMI (Kg/m <sup>2</sup> )	Ideal Body Size			
	Under weight (fig 1,2)	Normal weight (fig 3,4)	Over weight (fig 5,6,7)	Obese (fig 8,9)
Under weight (n = 26)	1 (0,83%)	23 (19,17%)	2 (1,66%)	0 (0%)
Normal weight (n = 56)	5 (4,17%)	47 (39,17%)	4 (3,33%)	0 (0%)
Over weight (n = 14)	0 (0%)	12 (10%)	2 (1,66%)	0 (0%)
Obese (n = 24)	0 (0%)	22 (18,3%)	2 (1,66%)	0 (0%)

Table 4: Physical activity according body image satisfaction

Body image satisfaction	Physical Activity		
	Low	Moderat	High
Desire to be Thinner (n = 60)	23 (19,17%)	30 (25%)	7 (5,83%)
Satisfied (n = 56)	12 (10%)	15 (12,5%)	2 (1,66%)
Desire to be Fatter (n = 14)	14 (11,67%)	13 (10,83%)	4 (3,33%)

Table 5: Physical activity according physical activity

Physical Activity	BMI			
	Under Weight	Normal weight	Over weight	Obese
Low	13 (10,83%)	17 (14,17%)	4 (3,33%)	15 (12,5%)
Moderate	11 (9,17%)	33 (27,5%)	6 (5%)	8 (6,67%)
High	2 (1,66%)	6 (5%)	4 (3,33%)	1 (0,83%)

Most participants (48.3%) had moderate levels of physical activity. Table 4 shows the level of physical activity based on the satisfaction of body image. Body image satisfaction has no relationship with the level of physical activity ( $P > 0.05$ ).

Table 5 presents the level of participants' physical activity based on their nutritional status. In the participants with obese nutritional status most of the participants had a low level of physical activity. Participants with underweight nutritional status mostly also have a low level of physical activity. The level of physical activity of a person is related to their nutritional status ( $p < 0.05$ ).

#### 4 DISCUSSION

This study analyzes the relationship between perceived and ideal body image and nutritional status of health students. Students between the ages of 18-25 experience a transition from late adolescence to early adulthood. At the time of being a student, many people start a new life apart from parents where they get more freedom including more freedom to have friends. This transition causes new habits as a form of adaptation to new life. Changes in behavior during the student period would usually also have an impact on health, one of them is nutritional status.

In our study, 29.17% of participants experienced body image distortion. Body image of students, especially women is formed due to the influence of family and peer environment, adolescents tend to compare their body shape with relatives or peers (Mase et al., 2015). Exposure to social media and electronic media also has an influence on the formation of body image in female students (Sai et al., 2018). Research on Iranian students shows a body image distortion of around 64% (Alipour and

Abbasalizad, 2015). The description of body size and shape gives rise to feelings of satisfaction or dissatisfaction with body shape (Coelho et al., 2016).

Most participants (50%) want to be thinner and only about 24% of participants are satisfied with their body shape. Overweight and obese women have a desire to be thinner (Pioreschi et al., 2017). Research by Wardle et al shows that 30% of women of normal weight want to lose weight but not all women are overweight and obese want to lose weight. Perceptions of overweight and efforts to lose weight are highest in a group of Asian countries where body weight is generally low. This shows that local culture and norms can influence attitudes toward weight (Wardle, Haase and Steptoe, 2006).

Satisfaction of body shape will affect dietary behavior and physical activity that is applied to achieve the desired weight. Dissatisfaction with body shape increases the risk of eating disorders and increases physical activity (Pioreschi et al., 2017). In this study, satisfaction with body shape did not affect the level of physical activity of participants ( $p > 0.05$ ). Most respondents (58%) have moderate level of physical activity. The decrease in physical activity occurs in students, one of which is caused by lack of time to exercise. The sport of choice is usually aerobic exercise (eg running, walking) (Majeed, 2015).

Being overweight is one of the factors associated with low physical activity (Unick et al., 2017). Different results were obtained in studies of female students in Saudi Arabia, where underweight students had lower levels of physical activity than overweight students (Khalaf et al., 2013). In this study, most obese participants had a low level of physical activity as well as underweight participants.

The level of physical activity is related to a person's body mass index. Active men have a lower risk of obesity compared to those who are less active

(Lee et al., 2016). A high level of activity in a person decreases the risk of being overweight in both men and women (Štefan et al., 2017). This is in line with our results of physical activity related to a person's nutritional status ( $p < 0.05$ ).

## 5 CONCLUSION

In this study, most participants wanted a normal body shape as an ideal body shape. Most participants were dissatisfied with their body shape and wanted to lose weight. Body image dissatisfaction is not related to physical activity but physical activity is related to participant's nutritional status.

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