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The Relationship Between Body Mass Index and Body Dysmorphic Disorder in Adolescents

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ABSTRACT

Perfection of appearance becomes a benchmark in one's self-confidence which can lead to an obsession with it. Body Dysmorphic Disorder is a person's tendency to imagine his physical disability as something that greatly affects him. This study aimed to determine the relationship between Body Mass Index (BMI) and the tendency Body Dysmorphic Disorder (BDD) in adolescents using a cross-sectional study design. Using random sampling, data collection was carried out using a questionnaire, namely the BDDQ, and a BDD tendency questionnaire based on aspects of preoccupation and distress in high school students. One hundred five respondents attended this study, with a female gender of 52.4% and 47.6% male with an age range of 14-16 years. In the research data, the highest range of Body Mass Index was 18.5-22.9 at 50.5%, and the least was BMI > 30 (2.9%). The results of the hypothesis test, the value of Asy. Sig. (2-sided) 0.544 > 0.05, so there is no relationship between Body Mass Index (BMI) and the tendency of Body Dysmorphic Disorder in adolescents.

Keywords: *Body Mass Index, Body Dysmorphic Disorder, Body Dysmorphic Disorder Tendency, teenager*

INTRODUCTION

Body appearance is very important and has become a major requirement for an ideal body today. Lifestyle, environment, and physical changes can affect the psychological development of adolescents in terms of body image, which is a description of how a person perceives and evaluates what he thinks and feels about the shape and size of his body and how other people evaluate him [1]. Appearance perfection is a benchmark in one's self-confidence which can lead to an obsession with it. The obsession with a perfect appearance can cause a problem called Body Dysmorphic Disorder (BDD), often called Body Dysmorphic Disorder. BDD is a person's tendency to imagine his physical disability greatly affecting him [2]. In the Diagnostic and Statistical Manual of Mental Disorders, revised III edition (DSM-III-R) and DSM IV, BDD is included in the somatoform disorder, which means complaints or physical symptoms that give the impression of a physical disorder, without which the disorder can be found objectively, or no mechanism can explain the disorder [3]. Based on DSM 5, BDD is included in the newest category of Obsessive, Compulsive, and Related Disorder (OCRD) [2].

BDD has characteristics such as excessive worry about its appearance and repetitive behaviors such as looking in the mirror and fixing its appearance [2]. Approximately 1-1.5% of the world's population has BDD tendencies, higher in cultures where appearance is important [4]. In the United

States, BDD can occur in women and men with an almost equal percentage, namely 2.2%, and 2.5%, and the tendency for BDD usually occurs at the age of puberty, namely 12-13 years [2]. In a survey conducted in Pakistan, as many as 78.8% of 156 students indicated dissatisfaction with their appearance, and 5.8% met BDD criteria according to DSM IV. The parts that became the focus of attention were weight problems (40.4%), skin (24.7%), and teeth (18%) [5].

In a study conducted in Surabaya on young women aged 15-18 years, 36 people felt their bodies were too fat, and 47 people felt they had normal weight. But these results did not match the calculation of BMI, which only found six people overweight and one obese people, so there is a discrepancy between the results of BMI measurements and what the subjects felt. The final results of the study found that 35% had a tendency for Body Dysmorphic Disorder in the high category and 36% for the medium category, and 29% for the low category [6].

Based on the data above, the researchers wanted to see the relationship between Body Mass Index (BMI) and the tendency of Body Dysmorphic Disorder in adolescents at a private high school in the Bekasi area. The formulation of the problem answered in this study is "Is there a relationship between Body Mass Index (BMI) and the tendency of Body Dysmorphic Disorder in adolescents at a private high school in the Bekasi area? The research objective is to determine the relationship between Body Mass Index (BMI) and the tendency of Body Dysmorphic Disorder in adolescents.

LITERATURE REVIEW

Body Mass Index (BMI) is a measurement tool that is most often and easily used to assess a person's nutritional status [7], especially to find out whether someone is under or overweight from their ideal body weight. Body weight has a linear relationship with height; under normal circumstances, body weight development will be in the same direction as the increase in height [8]. The components in measuring Body Mass Index (BMI), namely height and weight.

Body Mass Index is interpreted using standard weight status categories that are the same for all ages and sexes, different from determining nutritional status. In determining nutritional status, there are differences between the categories of children to adolescents and the adult category. In the interpretation of nutrition for adults, it is only determined by the value of the Body Mass Index (BMI), while the interpretation of nutrition for children is not the same because it has to be distinguished between the sex and the child's age (in months) which is related to the z-score. It is due to differences in body fat levels [9,10]. Determination of Body Mass Index or Body Mass Index according to age (BMI/U) for children aged 5-18 years according to the Indonesian Ministry of Health, namely:

Table 1. Classification of Body Mass Index to see the nutritional status of adults [11]

Category	BMI
Underweight	<18,5
Normal	18,5-22,9
Overweight	23,0-24,9
Obesity I	25,0-29,9
Obesity II	>30

Table 2. Body Mass Index/Age, children, aged 5-18 years [12]

Category	BMI
Very thin	<-3 SD
Thin	-3SD – -2SD
Normal	-2SD – 1SD
Fat	1SD – 2SD
Obesity	>2SD

While BMI/U for children aged 5-19 years, the World Health Organization (WHO) classifies it as follows [13].

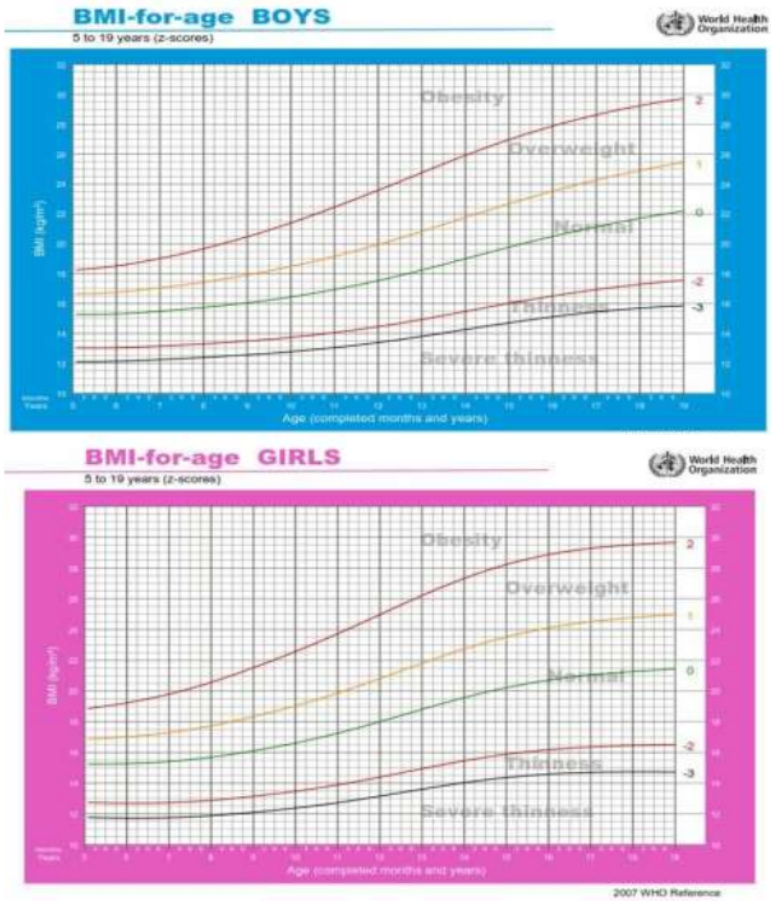

Figure 1. Determination of BMI/U for men and women aged 5-19 years according to WHO

Factors influencing Body Mass Index (BMI) [14] are age, gender, genetics, diet, and physical activity. Body Dysmorphic Disorder (BDD) was originally categorized as dysmorphophobia, which comes from the Greek "dysmorph," which means irregular shape. Then the name was changed and formalized as Body Dysmorphic Disorder in the American Psychiatric Classification. In simple terms, a person affected by Body Dysmorphic Disorder (BDD) is always worried about their appearance because they feel deficiencies in their body or a negative body image. Body image is the perception and assessment of one's body, physical function, and appearance [15].

Body Dysmorphic Disorder usually focuses not only on certain body parts but also on other body parts, distinguishing it from eating disorder/bulimia nervosa/anorexia nervosa, which usually involves anxiety about size and weight. The parts of the body that are often complained about and worried about are hair, nose, skin, teeth, genitals, facial structure, legs, cheeks, arms, lips, chin, stomach, waist, hips, thighs, eyebrows, head, ears, chest, scars, and height or weight measurements [16]. The tendency of Body Dysmorphic Disorder (BDD) can be interpreted if a person has behavior that is more inclined to the general symptoms of BDD.

According to Philips [17], there are two kinds of aspects of Body Dysmorphic Disorder, namely: aspects of preoccupation and aspects of distress/decreased function. Meanwhile, aspects that indicate BDD tendencies include: [18] a) Preoccupation with appearance; b) Having a negative body image; c) Often paying attention to the mirror to check appearance or avoid looking in the mirror; d) Avoiding social interaction or social functioning in a disturbed environment; e) Always taking care to improve the appearance and never satisfied with the results; f) Refuses or is dissatisfied with his/her self-portrait; g) Using excessive make-up or clothing to enhance appearance and cover deficiencies in himself. Forms of behavior that indicate a person has Body Dysmorphic Disorder are as follows: a) Periodically observing appearance for more than one hour per day or avoiding things that may reveal appearances, such as mirrors or cameras; b) Measuring or touching perceived deficiencies repeatedly; c) Asking for opinions that can confirm the appearance at any time; d) Camouflage the perceived physical deficiencies; e) Avoiding social situations and relationships; f) Has an obsessive attitude towards celebrities or models that affects their physical appearance; g) Thinking of doing plastic surgery; h) Always dissatisfied with the diagnosis of a dermatologist or plastic surgeon; i) Changing hairstyle and style to cover perceived deficiencies and changing skin color which is expected to give satisfaction to appearance; j) Strictly dieting with endless satisfaction.

Until now, no research has determined the cause of Body Dysmorphic Disorder. Two main aspects can be the cause of BDD, namely [19]: a) there is an imbalance of chemical fluids (the hormone serotonin) in the brain, which affects the level of one's obsession, and b) the possibility of nature, psychological, and cultural or environmental factors.

Research Design

The research design used is descriptive-analytic with a cross-sectional approach. The research was conducted at a private high school in the Bekasi area on October 9, 2019. The population was taken from the total number of 10th-grade high school students at a private high school in the Bekasi area of 122 students. The sample in this study was determined by random sampling using the Slovin formula. Based on calculations using the Slovin formula, the required sample is 93.48 = 94 samples. The instrument used in this research is a questionnaire. The questionnaire in this study consisted of 3 parts: Respondent data, Body Dysmorphic Disorder Questionnaire (BDDQ), and Body Dysmorphic Tendency Questionnaire according to Philips criteria. BBDQ is a self-report questionnaire that contains 4 question items for screening regarding Body Dysmorphic Disorder. Item 1, see if the respondent experiences pre-occupational aspects. Item 2 determines whether the pre-occupational aspect is due to an eating disorder. Item 3, see whether the preoccupation causes distress or impairment in the respondent. Item 4 looks at the time the respondent spends thinking about his daily deficiencies. In BDDQ, respondents were also asked about areas of the body they didn't like or were a problem with their appearance and examples of disabilities or things that respondents avoided because of their appearance [20]. Researchers made the Body Dysmorphic Disorder Tendency Questionnaire by modifying previous research questionnaires [21]. This questionnaire refers to aspects of preoccupation and aspects of distress. The questionnaire uses a Likert scale containing 29 favorable questions, which researchers have validated with a reliability coefficient or Cronbach's Alpha of 0.950 and categorized as excellent or very high reliability [22]. The data used in this study are primary data and secondary data. Primary data was obtained from questionnaires and the results of calculating the Body Mass Index manually, while

secondary data was obtained from 10th-grade students at one of the private high schools in the Bekasi area. The data obtained will then be processed systematically with several steps: editing, coding, tabulating and data entry. Interpretation of the Body Mass Index (BMI) was carried out quantitatively by calculating the student's BMI using the formula BMI = BB/(TB) [2] and then categorized into five categories (<18.5, 18.5-22.9, 23-24.9, 25-29.9, and > 30) without interpreting nutritional status. Interpretation of the Body Dysmorphic Disorder Questionnaire is carried out by giving a score of 0-4 based on the respondent's answers. This score is based on the number of "Yes" answers. If the accumulated score is 4, the positive respondent has a BDD tendency. On the question "is your main problem because you are too thin or too fat?" no score was given even if the respondent answered "Yes" because this question can also describe an eating disorder or eating disorder. The interpretation of the tendency of Body Dysmorphic Disorder is based on the aspects of preoccupation and distress proposed by Philips, using a Likert scale with a score of 1 (Strongly Disagree), 2 (Disagree), 3 (Medium), 4 (Agree) and 5 (Strongly agree), the higher the accumulated score of the respondents' answers means the higher the tendency towards Body Dysmorphic Disorder. The accumulated score of each respondent's answer will be categorized into five variable categories: very low, low, medium, high, and very high.

RESULT AND DISCUSSION

Table 2. Age of Respondents

Age	Frequency	Percentage
14	12	11.4%
15	91	86.7%
16	2	1.9%
Total	105	100%

This study was followed by 105 respondents with an age range of 14-16 years. Ninety-one students (86.7%) were 15 years old, 12 students (11.4%) were 14 years old, and two students (1.9%) were 16 years old.

Table 3. Gender of Respondents

Gender	Frequency	Percentage
Female	55	52.4%
Male	50	47.6%
Total	105	100%

Respondents in this study who were female were 55 students (52.4%) and 50 male students (47.6%).

Table 4. BMI Respondents

BMI	Frequency	Percentage
<18.5	21	20.0%
18.5-22.9	53	50.5%
23-24.9	12	11.4%
25-29.9	16	15.2%
>30	3	2.9%
Total	105	100%

Body Mass Index is categorized according to the BMI range set by the Ministry of Health of the Republic of Indonesia in 2010 without grouping nutritional status or z-score calculations. In the research data, the highest range of Body Mass Index was 18.5-22.9 at 50.5%, and the least was BMI > 30 (2.9%).

Table 5. Frequency of Respondents Worried About Appearance

Respondents Answer	Frequency	Percentage
Yes	62	59.0%
No	43	41.0%
Total	105	100.0%

Table 6. Frequency of Respondents who often think of Shortcomings in Appearance

Respondents Answer	Frequency	Percentage
Yes	64	61.0%
No	41	39.0%
Total	105	100.0%

There were 62 students (59%) out of 105 respondents who were worried about their appearance, and there were 64 students (61%) who often thought about deficiencies in their appearance. From the research data, it can be concluded that more than half of the respondents have pre-occupational aspects of the tendency for Body Dysmorphic Disorder. Self-awareness and feelings about yourself will lead to positive or negative self-assessments [23].

Table 7. Percentage of Body Parts Respondents Disliked

Disliked body part	Frequency	Percentage
Skin Color	13	12,4%
Pimple	50	47,6%
Scar	15	14,3%
Wrinkles	1	1%
Redness	2	1,9%
Hair	20	19%
Shape and Size		
Nose	14	13,3%
Mouth	4	3,8%
Chin	2	1,9%
Lips	7	6,7%
Stomach	26	24,8%
Waist	11	10,5%
Pelvis	8	7,6%
Congenital Abnormalities	3	2,9%
Others	36	34,3%

Based on questions about body parts they don't like, respondents can choose more than one option from skin color, acne, scars, wrinkles, redness, hair, shape, and size of nose, mouth, chin, lips, stomach, waist, pelvis, congenital abnormalities and or others. From the research, the highest percentage of disliked body parts was acne at 47.6%, and the least was wrinkles, which was only 1%.

Adolescents in their development experience various changes, including biological and psychological changes [9]. Biological changes consisting of physical changes are one of the triggers that impact psychological changes and affect a person's self-confidence [24]. Acne or acne vulgaris is inflammation of the sebaceous follicles characterized by comedones, papules, pustules, cysts, and nodules that most often occur on the face [25]. A study conducted on 1531 adolescents with acne showed the effect of acne on daily life, such as shame and low self-esteem (46.8%), affecting activities at school (21.4%), affecting hobbies (19 .4%), affects social life (19.2%) and avoids physical activities because of shyness (14%) [26].

Table 8. Interpretation Based on BDDQ Criteria

Interpretation	Frequency	Percentage
BDD tendencies	47	44.8%
Not BDD Tendency	58	55.2%
Total	105	100.0%

Table 9. Description of Gender in the Interpretation of BDDQ Criteria

Gender	Interpretation of BDDQ Criteria	
	BDD tendencies	Not BDD Tendency
Female	28	27
Male	19	31
Total	47	58

BDDQ interpretation is carried out by giving a score of 0 to 4 to assess or evaluate the possibility of BDD in respondents. BDD tendency was found if the score was 4. In this study, out of 105 respondents, 47 students (44.8%) experienced BDD tendencies, and 28 were women. More than half of student respondents who experience BDD tendencies are women because women tend to pay more attention to their appearance. According to Santrock, girls are more dissatisfied during adolescence or puberty and have a negative body image than boys. It is because there is a possibility of increasing body fat in young women, while young men are more satisfied with their body shape because it is during this period that their muscles begin to show [27]. According to Furnham, Badmin, & Sneade, the ideal female body is slim, emphasizing slim hips, buttocks, and thighs [28].

In a previous study in Bandung on young women who underwent treatment at a beauty clinic, it was found that if young women were dissatisfied with their body shape, then the body image that emerged was negative and would affect the self-esteem of these adolescents to be low so that it could lead to BDD tendencies. Other research explains that women have higher anxiety about their weight and physical appearance. Besides that, women are also very much affected by the words and body shapes of other women [29].

Table 10. Interpretation of BDD Trends

Interpretation	Frequency	Percentage
Very Low	4	3.8%
Low	1	1.0%
Medium	2	1.9%
High	86	81.9%
Very High	12	11.4%
Total	105	100.0%

Interpretation of BDD Tendency based on Preoccupation and Distress criteria by Philips. The higher the score obtained, the

higher the tendency towards BDD. In a study conducted of 105 respondents, there were four students (3.8%) in the very low category, one student (1%) in the low category, 2 (1.9%) in the medium category, 86 students (81.9%) in the high category and very high category 12 students (11.4%). So it can be concluded that the highest frequency of students is in the high category of 81.9%. In previous research conducted in Yogyakarta, it was found that the category was very low as many as four students (5.40%), low 15 students (20.27%), medium 37 students (50%), high 15 people (20.27%) and very high as many as three people (4.05%) with the highest frequency in the medium category [28].

Several factors can influence the difference in these results, can be influenced as cultural factors, which can affect students' non-formal education when at home or in a family, and different environmental factors, for example, the Bekasi area, which tends to be a metropolitan city or social factors, seen from the way of friendship, use of social media, and the economic environment among peers.

Table 11. Description of BDDQ Criteria Interpretation and BDD Trend Interpretation

BDDQ criteria	Very Low	Low	Medium	High	Very High
BDD tendencies	1	0	2	39	5
Not BDD tendencies	3	1	0	47	7
Total	4	1	2	86	12

When the interpretation of the BDDQ criteria and the interpretation of the BDD tendency criteria were combined, 39 students had a high tendency, and five students had a very high tendency.

Table 12. Description of the Relationship between the Interpretation of the Body Mass Index and the Interpretation of the Body Dysmorphic Disorder Questionnaire Criteria

BMI interpretation		Interpretation of BDDQ Criteria	
		BDD tendencies	Not BDD Tendency
<18.5	Frequency	12	9
	%	25.5%	15.5%
18.5-22.9	Frequency	20	33
	%	42.6%	56.9%
23-24.9	Frequency	6	6
	%	12.8%	10.3%
25-29.9	Frequency	7	9
	%	14.9%	15.5%
>30	Frequency	2	1
	%	4.3%	1.7%
Total	Frequency	47	58
	%	100.0%	100.0%

Description of the Interpretation of BMI with the Interpretation of BDDQ Criteria, the highest frequency of BDD tendencies based on BDDQ criteria is found in the range of BMI 18.5-22.9, namely 20 students (42.6%).

Table 13. Description of the Relationship between Body Mass Index Interpretation and Body Dysmorphic Disorder Tendency Interpretation

BMI interpretation		BDD Trends Interpretation				
		Very Low	Low	Medium	High	Very High
<18.5	F	1	1	0	18	1
	%	25.0%	100.0%	0.0%	20.9%	8.3%
18.5-22.9	F	2	0	2	44	5
	%	50.0%	0.0%	100.0%	51.2%	41.7%
23-24.9	F	1	0	0	9	2
	%	25.0%	0.0%	0.0%	10.5%	16.7%
25-29.9	F	0	0	0	13	3
	%	0.0%	0.0%	0.0%	15.1%	25.0%
>30	F	0	0	0	2	1
	%	0.0%	0.0%	0.0%	2.3%	8.3%
Total	F	4	1	2	86	12
	%	100.0%	100.0%	100.0%	100.0%	100.0%

In the description of BMI interpretation with an interpretation of BDD tendencies, it is found that interpretation of BMI with a range of 18.5-22.9 has a very high category of 41.7% and a high category of 51.2% of the entire BMI range with the same category of interpretation of BDD tendencies.

Based on the description of the relationship between BDD tendencies and BMI, it was found that BMI in the range of 18.5-22.9 had the highest BDD tendency compared to other BMI ranges.

The tendency of Body Dysmorphic Disorder in this study was regarding all ranges of BMI categories, with the highest number occurring in the BMI range of 18.5-22.9. It also proves that the tendency for Body Dysmorphic Disorder is different from eating disorders such as Anorexia Nervosa, which tends to affect people with a BMI <17 or, in cases of Bulimia which is more towards the normal BMI range (18.5-22.9) to above 30 [30].

Hypothesis testing

Chi-Square Tests

Table 4.13 Hypothesis Test Results

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	3.082	4	.544
Valid	105		

Based on the output table above, it is known that the Asymptotic Significance (2-sided) value in the Pearson Chi-Square test is 0.544. Asymp value. Sig. (2-sided) 0.544 > 0.05, it can be concluded that H_0 is accepted and H_1 is rejected. The research data concluded that Body Mass Index (BMI) could not affect the tendency for Body Dysmorphic Disorder in adolescents. It proved that the hypothesis proposed by the researchers was acceptable.

In previous studies, the tendency for Body Dysmorphic Disorder can occur because it is related to positive thinking by 20.79%, body image has a relationship of 12.56% and self-esteem by 23.64%, and adolescent age also has an indirect effect [6]. Adolescents must be able to find and explore their identities in early adolescence or early adulthood. The search for identity in adolescents and the influence of the surrounding environment can trigger a teenager's dissatisfaction. The greater the desire to look attractive or perfect, the greater the tendency for Body Dysmorphic Disorder.

The influence of social media use also affects adolescents' psychological development, one of which is the tendency toward Body Dysmorphic Disorder [31]. Today's youth face a period when everything changes quickly with new things. As a result, there are feelings of alienation, hopelessness, identity problems, and problems related to culture or identity [32]. Respondents in this study were students at a private high school with a high level of spirituality with quite dense teaching and learning activities. Maybe this is also one of the reasons why those who tend to have Body Dysmorphic Disorder and those who don't have a slight percentage difference.

CONCLUSION

The research that has been conducted shows that there is no relationship between Body Mass Index (BMI) and the tendency of Body Dysmorphic Disorder in adolescents. It shows that the tendency for Body Dysmorphic Disorder can occur in any BMI range. Thus, it is expected that the respondent will know and understand himself better. Respondents are expected to pay attention to their appearance and to increase activities that can positively affect them, such as increasing self-confidence or adapting to their environment.

Declaration by Authors

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