ATLANTIS
PRESS

The Relationship Between Body Image, Anemic Status, and Nutritional Status in Adolescence

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Abstract— Background: **Improper diet behavior and negative body image can affect adolescents' poor nutritional status. Poor nutritional status of adolescents affects nutritional status during pregnancy and is closely related to nutritional problems in children who will be. The anemia rate for adolescent girls in Bantul is still quite high and there is still a lack of data related to self-concept in relation to body image and diet behavior of young women.** Objective: **To determine the relationship between self-concept and diet behavior, body image, anemia status, and nutritional status of young women in Bantul, Yogyakarta.** Method: **This was a cross sectional study, taking subjects from 3 high schools in Bantul Regency with a cluster random sampling system.** Results: **There is a significant negative correlation between body image and the respondent's diet behavior (p <0.05) (rho = 0.4084) (moderate correlation) and between nutritional status and body image (p <0.05) of 0.6935 (strong correlation) . There is a significant positive correlation between dietary behavior and Hb levels (p <0.05) of 0.2128 (weak correlation). There is no significant positive correlation between nutritional status and anemia status (Hb levels) (p> 0.05) of 0 , 1648.** Conclusion: **The more negative body image, the higher the diet behavior; the higher the nutritional status, the lower the diet behavior; the lower the diet behavior, the lower the Hb level.**

Keywords— diet behavior, body image, anemia, nutritional status, adolescence

I. INTRODUCTION

Adolescence is the last period of rapid growth (Growth Spurt) where there is also hormonal instability when entering puberty. During this time, physical, psychological and cognitive development during adolescence can trigger nutritional and health problems. Adolescence is a period of seeking information and identity, including self-concept.

Self-concept is important for an individual's life because self-concept determines how individuals act in various situations [2]. In another sense, self-concept is the views and attitudes of individuals towards themselves. Self-view is related to physical dimensions, individual characteristics, and self-motivation. Self-view includes not only individual strengths, but also weakness and even failure himself. Self-concept is considered as a key role holder in the integration of individual

personalities, in motivating behavior and in achieving mental health [10].

Self-respect will determine how individuals will act in life. Moreover, an individual thinks that he can, then the individual will tend to be successful, and if the individual feels he is a failure, then in fact he has prepared himself to fail [8]. So it can be said that the self-concept that affects every aspect of experience be it thoughts, feelings, perceptions, and individual behavior [2].

Self-concept is relatively consistent over time and in situations, and results in relatively consistent behavior patterns [8].

Self is a series of perceptions, beliefs that organize about yourself. In it contains an awareness of who I am, what I do, which as a whole will color perceptions of the outside world so that in the end it affects the behavior that appears. Thus it can be said that all behavior that arises from individuals is the result of a process of free perception that is built and directed by the individual according to himself. So even though the self does not directly influence behavior, it also functions as an object of attitudes and feelings, although it also functions as a process that directs and builds behavior [5].

Negative self-concept has something to do with the perception of body image which can also influence adolescent behavior and diet patterns. Adolescents who are going through puberty must experience physical changes which can cause teens to be more concerned about their body shape (body image or body image). Teenagers build their own image about how they think about their body and what ideal body image they want to achieve. This can be influenced by their environment [3]. Body image or body image is a mental image that a person has about their own body, such as subjective feelings and thoughts about the body and limbs, body experiences including perceptions of body size, feelings of anxiety about the body and behaviors that adolescents do and don't do. because he is uncomfortable with his body [1]. Many adolescents have negative body perceptions, namely perceptions that do not match their actual nutritional status. Isnaeni in his research stated

that the majority of young women (60%) have negative body perceptions or have a perception that their bodies are not yet ideal [9]. A negative body perception is expected causing poor dietary behavior, such as reducing food consumption.

1. Several studies have shown that perception negative bodies become a trigger to improve their weight. As shown by research on the body image of adolescents in the United Arab Emirates, adolescents with more nutritional status are mostly on a diet to lose their weight, and some with normal nutritional status also have a similar diet [11]. If the diet to lose weight and diet behavior is not carried out properly, there is a risk of malnutrition in adolescents which can have an impact on adolescent nutritional status and anemia. One of the causes of adolescent anemia is the lack of fulfillment of iron needs coupled with menstruation which is starting to be experienced by young women.

Nutritional problems in adolescents aged 13-18 years in D.I Yogyakarta which still require attention and intervention actions related to short nutrition, underweight nutrition, obesity and anemia [7]. Therefore, it is very important to conduct a study of self-concept in relation to body image, diet behavior, anemia status and nutritional status of adolescents. In this study the researchers took the location in Bantul Regency, Yogyakarta because the anemia rate in Bantul Regency was still quite high, namely 27.67% according to the Monitoring Data on Nutritional Status of Bantul Regency (2013) and data on the variables taken was still very minimal. [1–3].

II. METHOD

This research is an analytical study with a cross sectional research design. [4]. The variables of this study were: self-concept, diet behavior, body image, anemia status, and nutritional status. This research will be conducted at 'Aisyiyah Yogyakarta University in September - October 2019. The research subjects were selected by cluster random sampling.   Population restrictions; The population in this study were high school students in Bantul. The sample size of this study was obtained by using a sample size formula to estimate the proportion of the population for descriptive research as follows.

$$n = \frac{Z^2_{1-\frac{\alpha}{2}} * p * (1-p)}{d^2}$$

explanation:

n = number of samples

$Z^2_{1-\frac{\alpha}{2}}$ = Z score pada $1 - \alpha/2$

level of confidence

p = proportion estimation

d = Level precision

90% confidence (1,645).

It is estimated that 50% of these students (target population) with abnormal nutritional status, have a negative body

image and poor dietary behavior, where d is set at 10% (0.01) and a confidence level of 95%.

By using sample formula in above:

n = (1.96² * 0.2* 0.8)/ (0.10²) = 62

subjects, and considering the possibility of losing the sample in the middle of the study, then adding 10% of the minimum sample size is needed 92 + 9 = 101 study subjects.

a. Subject characteristics

The subjects of this study were young women aged 14-16 (early adolescents) years (Criteria for the Ministry of Health, 2009) years with the following inclusion and exclusion criteria:

1) Inclution criteria

a) Respondents are high school student's in Bantul

b) Willing to follow research and sign inform consent.

2) Exclusion criteria

Suffering from chronic diseases (cancer, kidney, heart, diabetes mellitus, and stroke) and did not follow the whole research process.

Data collection tools;

a. Stepped Scales

In the form of digital scales with an accuracy of 0.1 kg to determine the body weight of adult subjects. How to measure the subject in a standing position, perpendicular to the front.

b. Statuemeter

Measuring the subject's height with an accuracy of 1 mm. Made of metal which has units of millimeters, centimeters and meters. When measuring, the subject must remove their footwear, then their heels, hips, shoulders and head are against the wall and look straight.

c. Self-concept questionnaire, diet behavior and body image

d. Hemoglobin (Hb) levels using the Easy Touch 3 in 1 home test

e. Questionnaire Characteristics of Research Subjects

f. The questionnaire contains personal data to determine household, socio-economic and demographic characteristics of research subjects.

III. RESULT AND DISCUSSION

The research data were analyzed by univariate and bivariate analysis. The variables analyzed were self-concept, diet behavior, anemia status, and nutritional status of adolescent girls. The research subjects came from 3 high schools in Bantul Regency which were selected by cluster random sampling. The sample of SMA that was selected was SMA Negeri 1 Imogiri, SMA Negeri 3 Bantul, and SMA Negeri 1

Banguntapan with the age of the respondents between 15-18 years. [6]. Discussions can be carried out in several sub-chapters.

The results showed that 85% of respondents had a low self-concept, which was still self-oriented and ego achievement. Then 5% of respondents are not concerned with other people's judgments, and 10% still do not have a clear self-concept.

Based on the calculation results, the empirical mean of dietary behavior is 76.56, which is lower than the theoretical mean with a value of 77.5. These results indicate that the respondent's diet behavior is lower than the average diet behavior.

There is a slight difference in the body image of the respondents, which are in the positive (53.91%) and negative (46.09%) categories. Although the number of respondents who had a positive body image was greater, the respondents who had a negative body image were quite large, namely 46.09%. This shows that there are still many young women who have negative concepts about the body image or body image. It can be said, respondents still feel not satisfied enough to accept the condition of their own bodies. This is confirmed by the results of statistical tests showing that there is a significant negative correlation between nutritional status and body image ($p < 0.05$) of 0.6935 (strong correlation). This means that the higher the nutritional status (BMI), the lower the body image or the fatter the negative body image you have.

The bad impact is, the concept of body image can affect adolescent diet behavior which can also have an impact on hemoglobin (Hb) levels which can lead to adolescent anemia. This is supported by the results of the statistical analysis of this study that there is a significant negative correlation between body image and the respondent's diet behavior ($p < 0.05$) (rho = 0.4084) (moderate correlation). This means, the more positive the body image, the lower the diet behavior. The results of this study are in line with research by Charles and Kerr (in Grogran, 2008) which states that the more positive a person's body image is, the lower the intensity of the diet behavior will be, and vice versa. In addition, it is also supported by the results of statistical tests that there is a significant positive correlation between dietary behavior and Hb levels ($p < 0.05$) of 0.2128 even though the correlation is weak. This means that the lower the diet behavior, the lower the Hb level too. There was no significant positive correlation between nutritional status and anemia status (Hb level) ($p > 0.05$) of 0.1648. This means that the higher the nutritional status (BMI), the higher the hb level. There is a significant positive correlation between diet behavior and Hb levels ($p < 0.05$) of 0.2128 (weak correlation). That is, the higher the diet behavior, the higher the Hb level too.

IV. DATA ANALYSIS

The research data were analyzed by univariate and bivariate analysis. The variables analyzed were self-concept, diet behavior, anemia status, and nutritional status of adolescent girls. The research subjects came from 3 high schools in Bantul Regency which were selected by cluster random sampling. The sample of SMA that was selected was SMA Negeri 1 Imogiri, SMA Negeri 3 Bantul, and SMA Negeri 1 Banguntapan with the age of the respondents between 15-18 years.

1. Self Concept

The results showed that 85% of respondents had a low self-concept, which was still self-oriented and ego achievement. Then 5% of respondents have no problem with other people's judgments, and 10% still do not have a clear self-concept.

2. Diet behavior

Dietary behavior variables were measured using a questionnaire with 4 answer choice scales, namely Very Fit (SS), Appropriate (S), Not Appropriate (TS), Very Unsuitable (STS) with favorable and unfavorable question components. The assessment criteria are as follows.

TABLE 4.1. DIET BEHAVIOR ASSESSMENT SCORE

Question Type Score	Skor				Question Number
	SS	S	TS	STS	
Favorable	4	3	2	1	1,2,3,4,5,6,7,8,9,15,16, 22,23,24,25
Unfavorable	1	2	3	4	10,11,12,13,14,17,18,19, 20,21,26,27,28,29,30,31

TABLE 4.2. BLUE PRINT OF THE DIET BEHAVIOR QUESTIONNAIRE

Variabel	Aspect	Sub Aspect	Item	
			Favorable	*Unfavorable*
Diet Behavior	Eksternal	How to eat Eating factor	1,2,3,4,5, 6,7,8,9	10,11,12,13, 14
	Emosional	*Emotional eating*	15,16	17,18,19,20, 21
	Restraint	Self control	22,23,24,2 5	26,27,28,29, 30,31

Descriptive analysis was carried out on dietary behavior variables by classifying subjects into three categories based on the normal distribution model (Azwar, 2009) and body image variables into the following two categories.

TABLE 4.3. CLASSIFICATION OF ANALYSIS CRITERIA BASED ON THEORETICAL MEAN

Variabel	Interval	Kriteria
Perilaku Diet	$X < (M - 1,0\ SD)$	LOw
	$(M - 1,0\ SD) \leq X, (M + 1,0\ SD)$	Medium
	$(M + 1,0\ SD) \leq X$	High
Body Image	Body Image desire – Body Image actual < 0	Negative
	Body Image desire – Body Image actual ≥ 0	Positive

Information :

M = Theoretical mean

SD = Standard Deviation

X = Score

From the classification of analyzes based on the theoretical mean presented in table 4.3, an overview of dietary behavior is obtained as follows.

Number of question items = 31

Highest score = 31 x 4 = 124

Lowest score = 31 x 1 = 31

Theoretical mean = (Highest score + Lowest score): 2

= (124 + 31): 2 = 77.5

Standard Deviation = (Highest score - Lowest score): 6

= (124 - 31): 6 = 15.5

Based on the results of the above calculations, the theoretical mean and standard deviation are obtained which are then used to calculate the interval value for categorizing the dietary behavior questionnaire scores as follows.

(M - 1.0 SD) = 77.5 - 15.5 = 62

(M + 1.0 SD) = 77.5 + 15.5 = 93

Furthermore, research data and calculation results are presented in the following frequency distribution table (Table 4.4).

TABLE 4.4. FREQUENCY DISTRIBUTION OF DIET BEHAVIOR

Variabel	Interval	Kriteria	N	Persentase (%)
Diet behavior	X < 62	Low	4	3.48%
	$62 \leq X$ 93	Medium	106	92.17%
	$93 \leq X$	High	5	4.35%

Based on Table 4.4, most of the respondents showed moderate diet behavior (92.17%), while 3.48% of 115 respondents showed low diet behavior, and 4.35% high diet behavior. To draw conclusions, it is necessary to compare the theoretical mean with the empirical mean of the variables. For this reason, the following calculations are performed.

Empirical mean = total questionnaire score: Number of Subjects

= 8804: 115

= 76.56

Mean score = Empirical mean: Number of question items

= 76.56: 31

= 2.47

Based on the results of the above calculations, the empirical mean of dietary behavior is 76.56, which is lower than the theoretical mean of 77.5. These results indicate that the respondent's diet behavior is lower than the average diet behavior.

3. Body Image, Anemia Status, Nutritional Status

Respondents' body image views are categorized into two, namely negative and positive body image. The results of the respondent's hemoglobin examination were used as a screening for the risk of anemia in the respondents which were then categorized into two groups, namely anemia and non-anemia. Nutritional status was measured using the Body Mass Index with three categories, namely underweight, normal, and overweight / obese. The frequency distribution of these data is presented in table 4.5 below.

TABLE 4.5. BODY IMAGE FREQUENCY DISTRIBUTION, ANEMIA STATUS, NUTRITIONAL STATUS

Variabel	Interval	N	Persentase
Body Image	Negatif	53	46.09%
	Positif	62	53.91%
Status Anemia	Anemia	14	12.17%
	Not Anemia	101	87.83%
Status Gizi	*Underweight*	45	39.13%
	Normal	38	33.04%
	Overweight/Obese	32	27.83%

Furthermore, the variables will be analyzed bivariately using the Spearman correlation test because the Hb, BMI, and Body Image data are not normally distributed after being tested using the Skewness and Kurtosis normality test (p <0.05).

TABLE 4.6 SPEARMAN CORRELATION TEST RESULTS BODY IMAGE, DIETARY BEHAVIOR, NUTRITIONAL STATUS AND ANEMIA STATUS

Variabel	Rho	P value
Body Image dan Perilaku Diet	-0,4084	0,0000*
Status Gizi dan Body Image	-0.6935	0,0000*
Status Gizi dan Status Anemia	0.1648	0.0783
Perilaku Diet dan Status Anemia	0.2128	0.0224*

There is a significant negative correlation between body image and the respondent's diet behavior (p <0.05) (rho = 0.4084) (moderate correlation). There is a significant negative correlation between nutritional status and body image (p <0.05) of 0.6935 (strong correlation). There was no significant positive correlation between nutritional status and anemia status (Hb level) (p> 0.05) of 0.1648. There is a significant positive correlation between diet behavior and Hb levels (p <0.05) of 0.2128 (weak correlation)..

V. CONCLUSION AND LIMITATION

Most of the respondents still have a low self-concept, which is self-oriented and ego achievement. There is a relationship strong among nutritional status with body image, there is a moderate significant relationship between body image and diet behavior, a weak relationship between dietary behavior and anemia status, and there is no significant relationship between nutritional status and anemia status of female adolescents in Bantul Regency.

VI. POLITENESS

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