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## Overview of Toddler Height and Weight in Patients with Malnutrition at the Dukuh Kupang Health Center, Surabaya

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### ABSTRACT

Children do not get enough energy intake, so the body will use energy reserves in the form of fat and protein to maintain important body functions. This can cause weight loss in children, especially if the nutritional deficiency lasts for a long time. Overall, a child's height and weight are very important in assessing a child's nutritional status because both are good indicators of growth and development. If there are disturbances in the growth and development of children, then this can be a sign that the child has nutritional problems that need to be taken seriously. This study aimed to determine the relationship between height and weight with malnutrition in infants at the Dukuh Kupang Health Center area as a descriptive observational study. The data used in this study were height and weight data as well as the nutritional status of infants obtained from Health Centers in the Dukuh Kupang Health Center area. Regression analysis was performed to determine whether height and weight have a significant effect on the nutritional status of infants. The results showed that height and weight had a significant effect on the nutritional status of infants, with significant regression coefficient values for each variable. In addition, the ANOVA test also shows that the regression model used is significant. These results can be used as a basis for improving public health programs related to the problem of malnutrition in toddlers in the Dukuh Kupang Health Center area.

### 1. Introduction

Malnutrition is a condition in which a person does not get enough nutrition to meet their body's needs. This condition usually occurs in people who are less able or in less developed areas. Malnutrition can cause various health problems, such as decreased endurance, lack of energy, low body weight, growth retardation, hair loss, dry and scaly skin, as well as cognitive and developmental problems.<sup>1-5</sup>

Malnutrition in toddlers is very dangerous because it can hinder the growth and development of children physically and mentally. The serious impact of malnutrition on children under five can last a lifetime and can affect their ability to study, work and live independently in the future. Efforts to prevent and overcome malnutrition can be carried out by

increasing access to and availability of nutritious food, increasing public knowledge and awareness about the importance of balanced nutrition, and improving the quality of health services, especially in less developed areas. It is also important to carry out routine checks and monitor the nutritional status of children on a regular basis in order to detect nutritional problems early and prevent malnutrition.<sup>6-8</sup>

Optimal physical growth in toddlers is very important because, during this period, there is a very rapid development of organs and body tissues. However, in toddlers who experience malnutrition, the nutritional needs needed to support growth are not met. As a result, the physical growth of children under five is stunted and can lead to various problems, such as low body weight, growth delays, and a higher risk

of contracting infectious diseases. Children who experience malnutrition also tend to tire more easily and find it difficult to move around.<sup>9-12</sup> This study aimed to determine the relationship between children's height and weight on the incidence of malnutrition at the Dukuh Kupang Health Center, Surabaya, Indonesia.

## 2. Methods

This study was a descriptive observational study and used primary data obtained from the Dukuh Kupang Health Center, Surabaya, Indonesia. As many as 3 respondents were included in this study, and the

## 3. Results and Discussion

Table 1. Characteristics of test variables.

<b>Respondent</b>	<b>Body height/cm</b>	<b>Body weight/Kg</b>	<b>Malnutrition Z-score</b>
Respondent 1	80,1	8	-3.25
Respondent 3	75,5	7,3	-3,32
Respondent 5	72	6,2	-4,36
Mean	75,87	7,17	-

Table 1 shows that the average height of toddlers at the Dukuh Kupang Health Center in Surabaya is 75.87 cm. There are variations in the height of toddlers measured, where the lowest toddler's height is 72 cm, and the highest is 80.1 cm. These results indicate that there is a significant difference in toddler height at the Dukuh Kupang Health Center in Surabaya. Abnormal height can be a risk factor for malnutrition in toddlers. From these data, it can also be found that the average weight of toddlers at the Dukuh Kupang Health Center in Surabaya is 7.17 kg. Based on these data, there are variations in the weight of toddlers measured, where the lowest toddler's weight is 6.2 kg, and the highest is 8 kg. These results indicate that there is a significant difference in toddler weight at the Dukuh Kupang Health Center in

research subjects met the inclusion criteria. The inclusion criteria in this study were under-five patients with malnutrition at the Dukuh Kupang Health Center in Surabaya and obtaining consent from the subject's parents to be included in this study. This study was approved by the Medical and health research ethics committee. This study observed data on the height and weight of the research subjects. Next, the data were analyzed using SPSS version 25. Univariate analysis was performed to present the distribution of each data variable test. Meanwhile, linear regression analysis was carried out to see the relationship between variable tests.

Surabaya. Abnormal body weight can also be a risk factor for malnutrition in toddlers. The data obtained showed that three respondents experienced malnutrition with a Z-score between -3.25 and -4.36. These results indicate that the height and weight of toddlers greatly affect malnutrition at the Dukuh Kupang Health Center in Surabaya. In this case, toddlers with less height and weight can experience a higher risk of malnutrition. Therefore, it is necessary to make efforts to prevent and overcome the problem of malnutrition in toddlers, one of which is to provide appropriate nutritional assistance and optimize health services at the Health Center.<sup>13-16</sup>

Testing the coefficient  $a$  in the regression test is useful for testing whether the independent variable has a significant influence on the dependent variable

or not. The coefficient  $a$  in the regression test is a parameter that describes the changes that occur in the dependent variable when the independent variable changes by one unit. In this test, the null hypothesis being tested is that the coefficient  $a$  is not significantly different from zero, or in other words, the independent variable has no significant effect on the dependent variable. If the significance value (sig) is less than the specified level of significance, then the null hypothesis is rejected, which indicates that there is a significant influence between the independent and dependent variables. Conversely, if the sig value is greater than the specified level of significance, then the null hypothesis cannot be rejected, which indicates that the independent variable has no significant effect on the dependent variable. Coefficients  $a$  for baby's weight has a sig value of .000, while for baby's height, it has a sig value of .001. This shows that these two variables significantly affect the response variable (total baby's weight and baby's length). The smaller the sig value, the more significant the influence of these variables on the response variable. In addition, the sig value for the constant is 0.490, indicating that the value is not statistically significant and does not make a significant contribution to the response variable. In regression analysis, the constant value represents the average value of the response variable when all independent variables are 0. If the sig value for the constant is not significant, this means that the effect of the independent variable on the response variable is more important than the condition when all independent variables are 0.

The significance value on the ANOVA test shows the significance of the overall regression model. The smaller the sign value, the more significant the regression model. In this case, the significance value is 0.000, which means that the overall regression model is statistically significant. MSE (mean square error) is a measure of how well the regression model fits the data. The lower the MSE value, the better the regression model is at predicting the data. In this case, the MSE value at its regression is 4.210, which

indicates that the regression model has a good fit with the data. The residual is the difference between the actual value and the value predicted by the regression model. The MSE of the residuals shows how well the regression model explains the variability that cannot be explained by the independent variables in the model. In this case, the MSE value of the residuals is 0.270, which indicates that the regression model is quite good at explaining the variability that cannot be explained by the independent variables in the model.

The R square value, or the coefficient of determination, is a measure of how well the regression model is able to explain the variation of the dependent variable ( $y$ ), which can be explained by the independent variable ( $x$ ) in the model. The R square value ranges from 0 to 1, where the closer to 1 indicates the better the regression model is in explaining the variation of the data. In these data, the R square value of 0.706 means that the regression model used is able to explain around 70.6% of the variation in the baby's weight, which can be explained by the baby's height variable. This value can be considered quite good

#### **4. Conclusion**

The data obtained showed that three respondents experienced malnutrition with the Z-score of each respondent, namely -3.25, -3.32, and -4.36. Malnutrition in infants is significantly influenced by body weight and height.

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