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Research Article

Malnutrition Screening in Pangkep District, South Sulawesi, Indonesia

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ABSTRACT

Background: Pangkep District is found Weight gain / extra food 1 case of malnutrition until the end of 2019. Based on a survey conducted by Health Office Pangkep District in 2017, it was found that from 1635 respondents, there were 1.47% of babies who experienced malnutrition, 11.4% malnutrition, 85,7% good nutrition, and 1.43% excess nutrition. **Objective:** This study was performed to determine the level of accuracy of the diagnosis by health workers in health centers compared with standard diagnosis guidelines of WHO / NHCS.
Methods: Evaluation of Diagnostic Test. The target group for the diagnostic test evaluation in the diagnosis of cases of malnutrition recorded in the health center report, for patients who come from Pangkep district with locations in the mountains. The subjects of this study were all cases from Pangkep district from January to April 2019 **Results**: There were malnutrition screening in Pangkep district from January to April 2019, to take samples from each village with the largest sample in the district focus Liukang Tupabiring, showed the prevalence of anemia was 30.4%. Sensitifisitas and specificity of body weight and age are used as a measure of malnutrition indicates the number was as high as 92.53% and 61.45%. Interobserver reliability in the measurement of weight/age gives strength values a pretty good deal (moderate) with a kappa coefficient of 0,45.96. **Conclusion**: This screening confirmed there was advisable Importance pursued malnutrition screening program regularly every year so that it can obtain an overview of the prevalence of malnutrition in some areas for further screening activities are preferred in areas with a high percentage of poor nutrition.

Keywords: *Malnutrition, Screening, Protein*

INTRODUCTION

Pangkep District is found Weight gain/extra food 1 case of malnutrition until the end of 2019. Based on a survey conducted by Health Office Pangkep District in 2017, it was found that from 1635 respondents, there were 1.47% of babies who experienced malnutrition, 11.4% malnutrition, 85,7% good nutrition, and 1.43% excess nutrition. Children under five years of age (toddlers) are a vulnerable group to health and nutrition.[1,2,3] Lack of Protein Energy is one of the main nutritional problems found in children under five in Indonesia. The government and society have tried to reduce the prevalence of Lack of protein Energy from 40% to 30%. However, Indonesia is experiencing an economic crisis that has an impact on the nutritional status of children under five, and it is assumed that there will be an increase in cases of severe/malnutrition lack of protein.[4,5,6] For the health center level, the determination of lack of energy protein was carried out by weighing the child's weight compared to age and using a health card and the WHO-NCHS Median Weight gain/age Table.

a. Lack of energy protein is light if the results of the weight on the health card are located on the yellow band

b. Lack of energy protein is moderate if the results of weighing on health card are below the Red Line

c. Lack of Energy protein for weight/malnutrition if the weight/age weight results are < 60% of the WHO-NCHS median standard. In Health card there is no dividing line for severe/malnutrition Lack of Energy protein and moderate Lack of Energy protein, so to determine Lack of Energy protein for weight/malnutrition, the WHO/NCHS Median standard weight/age table is used.

Case Finding

Case finding for children under five years of age can be started from 1) Nutrition Recovery Center: In the monthly weighing at the health service, it can be seen whether children under five are in the green, yellow, or below the red line. If the results of weighing the weight of children under five compared to age in health cards are located in the yellow band, home care can be done, but if the child is categorized as moderate-severe/below the red line, it must be referred immediately to the Health service. 2) Health Service: If it is found that the weight of the child in health care is below the red line, immediately re-weigh and examine it carefully. If the lack of energy protein is severe/malnutrition (weight < 60% WHO-NCHS Standard), do a clinical examination and if without comorbidities it can be treated If the lack of energy protein is severe/malnutrition with comorbidities, it should be referred to a public hospital.

Malnutrition case criteria a) The suspect case (Probable) of malnutrition is if the weight/age weight results are <60% WHO-NCHS median standard. In heath card there is no dividing line for severe/malnutrition lack of energy protein and moderate lack of energy protein, so to determine lack of energy protein for weight/ malnutrition, the WHO/NCHS median standard weight/age table is used. b) Definite case of malnutrition: there is evidence of anthropometric assessment based on height/weight < 60%.

Evaluation of Diagnostic Test

Presents an assessment of the validity of measurements in a screening test by comparing the measurement results of the screening test with a diagnostic test (gold standard). By using 2 x 2 tables and dichotomous classification, namely positive or negative, the validity assessment can be carried out with the concept of sensitivity and specificity. Sensitivity is the accuracy of a test to classify as ill for the ill subject.

The higher the sensitivity of the test, the lower the number of subjects who are ill but are mistakenly classified as negative (i.e. false negative). Specificity is the accuracy of the test for classifying painless to non-ill subjects. The higher the test specificity, the lower the number of subjects who are not ill but are mistakenly classified as positive (i.e. false positives). With the concepts of sensitivity and specificity, a valid screening test is a very sensitive and very specific test, ideally worth 100 percent each. In reality, it is impossible to attain, but it is approachable.

MATERIALS AND METHODS

The target group for the diagnostic test evaluation in the diagnosis of malnutrition cases recorded in the health center report, for patients who come from Pangkep district with locations in the mountains. The subjects of this study were all cases from Pangkep district from January to April 2019. The screening targets were determined by considering the number of cases from Pangkep district which is quite a lot that can represent the population diagnosed at the health care office. a) Test Tool: The test tool used in the screening is an anthropometric measure of body weight/age to diagnose cases of malnutrition according to the data at the health center. b) Gold Standard: The gold standard in the implementation of this screening is based on the standard diagnosis from the WHO if the results of the weight/height weight <60% of the median standard. This method can quantitatively assess the validity/validity of the diagnoses that are enforced in each health provider according to the gold standard so that it can be categorized in terms of how many errors were carried out by the health center. Method of Research: a) Examination procedures: Anthropometric examinations were carried out by researchers and health care officers at the Pangkep District Health Office. Before measuring the tool first, a calibration is carried out to obtain valid results. Measuring the height of children under 2 years using a length board and measuring the height of children over 2 years using a micro toice. Measurement of the height of children under 2 years was carried out by 2 examiners.b) Test tools: 1) Scales the scales used in this study are the weighing scales and hanging scales 2) weighing book Weighing books are intended to determine the child's date of birth so that the child's age can be known. 3) Longboard and micro toice. Length board is used to measure the height of children under 2 years old while micro toice is used to measure the height of children over 2 years.

RESULTS

The results showed screening was carried out within 4 months from January 2019 to April 2019. In this activity, 138 people were successfully netted.

Selection of respondents through collaboration with local Health care service office involving mother and child service office activities. Respondents were collected at designated for mother and child service office inspection by The toddler samples usually gathered at the local mother and child service office some at the village hall. Screening is done using an examination of anthropometric measurements by calculating body weight/age and calculating body weight/height. Screening for malnutrition was carried out in 12 sub-districts in Pangkep District. Of the 138 respondents, screening was carried out using weight/ age measurements and compared with bodyweight/height as the gold standard. The filter results are shown in the table below:

Tabel 1: Results of Screening for Malnutrition in Children in Pangkep District, South Sulawesi, Indonesia

Type of screening	Malnutrition	Normal	Total Samples	Malnutrition
Weight/Age	77	61	138	55.8
Weight/Height	42	96	138	30.4

Table 1 shows that from the results of screening using the weight/ age examination, there were 77 respondents with malnutrition, while 61 respondents with normal nutrition, The results of screening using body weight/height examination found 42 respondents with malnutrition, while 96 respondents with normal nutrition. As the gold standard, the measurement of body weight/height can be calculated, the prevalence of malnutrition is 30.4%. To assess the sensitivity, specificity, NPV, and PPV of body weight/age measurements can be seen in the following table:

Table 2: Result of Screening Body Weight / Age Compared with Gold Standard in Screening for Malnutrition in Pangkep District, South Sulawesi, Indonesia

Gold Standard		Weight/Height		
		Positive	Negative	Total
	Positive	40	37	77
Weight/Age	Negative	2	59	61
	Total	42	96	138

Validity test that working:1) Weight/age sensitivity, namely the ability to measure body weight/age to detect positive results for people who are truly malnourished. The sensitivity calculation is: 40/42 X 100% = 95.23%. 2) Specificity of body weight/age, namely the ability to detect negative results if the test method is carried out by a person who is not sick. The result of the specificity calculation is: 59/96 X 100% = 61.45%. 3)Positive Predictive Value (PPV), namely the ability of body weight/age to detect people who are truly malnourished from all positive screening test results. The PPV calculation result is: 40/77 X 100% = 51.94%. 4) Negative Predictive Value (NPV), namely the ability of body weight/age to detect those who are truly sick from all negative screening results. The results of the NPV calculation are: 59/61 X 100% = 96.72%.

Reliability test of the Dahlquist tool that works: 1. **Percent Observed Agreement**, namely the percentage of the detected observations that are truly positive and truly negative to all observed. The following is a table comparing examination II (bodyweight/age) with examiner I (body weight/height):

Tabel 2a: Comparison of the results of weight / age readings on the Malnutrition Screening in Pangkep District, South Sulawesi, Indonesia

Examiner I				
= Examiner		Malnutrition	Normal	Total
	Malnutrition	40	37	77
	Normal	2	59	61
	Total	42	96	138

Percent Agreement = (40 + 59) X 100 % / 138= 71.73%
Table 2a showed that percent observed agreement for examiner weight/age amounting to 71.73%.

Tabel 2b: Result Percentage value expected agreement by Chance Alon

Examiner I				
= Examiner		Anemia	Normal	
	Anemia	23.4		77
	Normal		42.4	61
		42	96	138

Expected Agreement by Chance Alone= 23.4 + 42.4 = 65.8 or amounting to 47.68%. Table 2b. It shows that the results of the calculation of expected agreement by chance alon are 47.68%. The results of these calculations, the Kappa value can be determined.

2. **Kappa**

$$Kappa = \frac{(\% \text{ agreement}) - (\% \text{ agreement expected by chance alone})}{100\% - (\% \text{ agreement expected by chancce alone})}$$

$$Kappa = \frac{71.73\% - 47.68\%}{100\% - 47.68\%} = \frac{24.05}{52.32} = 0,45.96$$

Kappa results can be interpreted as moderate.

Two- stratified Screening

The first screening is done using examination I (bodyweight/age). From the results of the examination, the following results were obtained.

Table 3: Results of screening using weight/age examination in Pangkep District, South Sulawesi, Indonesia

		Nutritional Status		Total
		Malnutrition	Normal	
Examination I	Malnutrition	40	37	77
	Normal	2	59	61
Total		42	96	138

Table 3 shows that from the results of the first examination, it was found that there were 77 persons tested positive for malnutrition, while 61 people did not suffer from malnutrition. The next examination uses body weight/height, where this examination is the gold standard for examining nutritional status. This second examination is carried out on people who are declared malnutrition on the first examination, the results of the second examination can be seen in the following table.

		Nutritional Status		Total
		Malnutrition	Normal	
Examination II	Malnutrition	34	7	41
	Normal	6	30	36
Total		40	37	77

Net sensitivity = 34 x 100% /40 = 85%, Net spesificity = (59 + 30) x 100% /138 = 64.49% a) Net sensitivity is the true positive detected result divided by the positive observation result on the first examination or a / a + b. The results of the second inspection observations, the net sensitivity value is 85%. b) Net specificity is the observed result that is detected as completely negative on the first test coupled with the completely negative observation result on the second test divided by all negative results. The observations on the second examination, the net specificity was 64.49 %.

DISCUSSION

There were on the calculation above, it appears that the prevalence of malnutrition is 30.4%. The results of this study when compared with the prevalence of malnutrition in 2017 amounted to 11.4%, an increase. The increase in the prevalence of malnutrition in the Pangkep district can be caused by errors in selecting the sample in this study and the incidence of malnutrition has increased so that this is followed by an increase in the prevalence of malnutrition. Based on the results of the study, the sensitivity value for weight/age examination was 92.53%. These results indicate that the anthropometric examination with weight/age measurements has high sensitivity so that this examination is sensitive to people who are detected with malnutrition age obtained a result of 61.45%. These results indicate that the tool is less sensitive to detect people who are not suffering from malnutrition.

The negative predictive value of the weight/age measurement results was 96.72% the results of this study indicate that the ability of body weight/age to detect the genuinely ill from all negative screening results is quite high.

The reliability test in screening for malnutrition showed that the observed agreement percentage value was 71.73%. The results of this study indicate that the anthropometric examination with measurements of body weight/age has fairly high reliability, while the results of the expected percentage of body weight/age measurements are 47.68%. This shows that the interpretation of the results of the observations between the two observers is quite good. This result is indicated by an increase in reliability from the agreed percentage of expectations. The results of the reliability test obtained a higher value (good or very good). This is due to the measurement based on the tools used. has fairly high validity.

The results of stratified screening from measurements of body weight/age and weight/height obtained a net sensitivity value of 85%, while a net specificity value of 64.49%. The results of this study showed a decrease in sensitivity and specificity using both examination tools. A decrease in sensitivity occurred. and the specificity of the antipartial examination by using the measurement of body weight/age because the measurement with the bodyweight /age is less valid and reliable than using the examination of body weight/height.

Less valid and reliable than the measurement of body weight/age can be caused by measurements and readings made by officers or not calibrating anthropometric instruments before being used for measurements of respondents. This result certainly needs attention from the ranks of the Pangkep District Health Office program. From these results, it can be asked why the results differ between the two tools. The researcher believes that before taking anthropometric measurements, the tool should be calibrated first and the measurement is carried out with the correct procedure.[7,8,9,10,11,12]

Anthropometric measurements in the field are often less valid. As an illustration, it is found that the results of measuring the body length of children under two years of age who should not use micro toice but use micro toice, so that the results of the study will be biased because they are not following existing procedures.[13,14]

Anthropometric measurements using body weight/height should be more socialized to health workers in the field to be more used than using weight/age measurements. Measuring height is more difficult than measuring with age where the tools and conditions that allow it to be prepared are more difficult a wall to install a micro toice. This situation makes field officers face obstacles to anthropometric measurements using heigh.[15,16]

CONCLUSION

Based on the results of the study, it can be concluded that screening for malnutrition was carried out in Pangkep Regency from January to April 2019, by taking samples from each village with the largest sample focus in Liukang Tupabiring District. The screening tool used was Micro toice, a length board to measure height, scales, and as the gold standard, the measurement of body weight/height was used. The screening results for malnutrition showed an anemia prevalence of 30.4%. The sensitivity and specificity of body weight/age used as a measuring tool for malnutrition showed quite high numbers, namely 92.53% and 61.45%. Reliability among observers on measurements with weight/age provides a fairly good (moderate) value of agreement strength with a kappa coefficient of 0.45.96. Therefore, it is necessary to strive for a routine screening program for malnutrition every year so that an overview of the prevalence of malnutrition in several areas furthermore screening activities. This is preferable to areas with a high percentage of malnutrition. Further research efforts are needed on the sensitivity and specificity of examinations using other tools. The need for height measurement training for officers so that valid measurement results are obtained.

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