

## COMPARISON BETWEEN ANTHROPOMETRIC MEASUREMENT RESULTS BY CADRES AND MEDICAL PROFESSION STUDENTS USING TIPS (TIKAR PENDETEKSI STUNTING)

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### ABSTRACT

Stunting prevalence in District Kalipare on February 2019 was about 14%. Based on the results of the preliminary studies, one of the obstacles to achieving a free stunting rate is caused by anthropometric measurement errors by cadres. The objective of this study was to compare cadres of District Kalipare anthropometric measurement results with medical profession students' anthropometric results using the Tikar Pendeteksi Stunting (TIPS). This quasi-experimental study was conducted using a non-randomized control group pretest-posttest design. The sample of toddlers is 51 toddlers. The experiment was carried out by training 50 community-based health or posyandu cadres who were representatives from 8 villages in Kalipare District. Of the 50 cadres, 25 were selected by purposive sampling according to posttest scores per village. The selected cadres were asked to measure 1-3 infants or toddlers who had previously been measured before attending the training. The variables studied were nutritional status and height. The results showed that the Kappa test obtained a value of  $p = 0.838$  or very good agreement. This study concludes that the results of height measurements by toddler posyandu cadres are the same as or close to the results of height measurements carried out by medical profession students. Therefore, after they have received training, we can include posyandu cadres in measuring anthropometrics.

### KEYWORDS

Stunting, Posyandu Cadre Training, Anthropometric Measurement Skills

### INTRODUCTION

The nutritional status of toddlers is one of the health indicators in achieving the Sustainable Development Goals (SDGs) number 2 (no hunger) and number 3 (healthy and prosperous life). Stunting (dwarf) is a condition in which toddlers have less length or height compared to their age. This condition is measured by length or this height that is more than minus two standard deviations of the WHO child growth standard in the median. Stunted toddlers are a chronic nutritional problem caused by many factors, such as socio-economic conditions, maternal nutrition during pregnancy, infant illness, and lack of nutritional intake in infants. Stunted toddlers are at risk of experiencing difficulties in achieving optimal physical and cognitive development during their growth and development period [1].

From the stunting toddler data collected by the World Health Organization (WHO), Indonesia is the third country with the highest stunting incidence in the Southeast Asian region after Timor Leste and India. The average prevalence of stunting under five that is according to Basic Health Research (Riskesdas) in Indonesia from 2005 until 2017 was 36.4%. This figure decreased to 30.8% in 2018, meaning that 3 out of 10 toddlers in Indonesia are stunted [2]. Because of this, the percentage of stunting is under five in Indonesia is still high and is a health problem that must overcome [3].

In 2017 the stunting rate among toddlers in East Java reached 26.7%. The routine measurement of toddlers at the Kalipare Health Center in February 2019, found that the average height for age in

toddlers was around 14%, which was short and very short (stunting). However, the prevalence is greater than 14% because not all toddlers come to the posyandu, a form of community-based health effort that belongs to the community and is integrated into people's life and culture or the weighed. Based on the report from Kalipare Health Center, known as Kalipare District, Malang Regency has the lowest percentage in the anthropometric weighing or measurement (D/K) program. This program also illustrates the low motivation of parents to know their child's development. If the D/K score is low, the prevalence of stunting in that village is not representative.

Conversely, the prevalence of stunting may also be lower than reported. Accurate stunting prevalence data requires precise and accurate measurements. Correct measurements are key to calculating anthropometric indicators such as stunting and wasting being underweight in children. Anthropometric indicators are essential for monitoring progress in hunger eradication and reducing health inequalities by assessing health interventions [4].

Specials knowledge and expertise needed in toddler anthropometric measurement activities are obtained through the training process [5]. In this case, integrated healthcare center cadres can be trained to become partners in realizing the success of the government's program on stunting. Cadres must understand and be able to interpret the Body Weight/Height Body and Height Body/Age curves. An interpretation that is not appropriate can lead to the wrong classification [5].

From the results of the preliminary study, one of the reasons for the low number of visits to the posyandu (integrated healthcare center) is the low trust of the residents in the cadres. According to residents, cadres lack knowledge, competence, and skills regarding stunting due to a lack of training for cadres on stunting. In addition, it is considered that there are still many cadres who are less active and cohesive among fellow cadres. (Interviews with community leaders).

A study in Ghana in 2018 regarding anthropometry and stunting stated that from observations of only 67% is make accurate plans that are carried out by health cadres accurate plotting was carried out by health cadres. Because the health cadres people have not received formal training in the health sector so cadres find it difficult when plot also caused by the cadres' poor eyesight.

Measurement errors can also occur due to excessive working hours and situations where measurements are crowded or not conducive. However, measurement errors can be minimized through means of intense training for health cadres. Carrying out calibration activities and the measurements several times on the same child can increase the reliability of anthropometric measurements. In addition, it is necessary to provide special criteria for anthropometry measurements according to standards. Health cadres should be accompanied by health workers when taking anthropometric measurements [6].

Anthropometric measurement training activities to increase the knowledge and skills of health cadres. The training used the Stunting Detection Mat (TIPS) (Figure 1) made by the research team. During the training, training materials are provided by medical profession students. As a group that received formal health and medical education, medical profession students certainly have higher health and medical knowledge than health cadres.

Residents' suspicions about the incompetence of health cadres in dealing with stunting need to be proven. In this case, the accuracy of anthropometric data is very important to describe the actual prevalence of stunting. The results of anthropometric measurements of health cadres need to be compared with medical profession students.

Based on the background above, the researcher wanted to know the practice of anthropometric measurements of toddlers carried out by health cadres. In addition, the researchers wanted to compare the results of anthropometric measurements by Kalipare District health cadres and a group of medical profession students in detecting stunting using the Stunting Detection Mat (TIPS).

## MATERIALS AND METHODS

This quasi-experimental study used a non-randomized without control-group pretest-posttest design. This research was conducted in September-October 2019 in Kalipare District.

The intervention was in the form of counseling on stunting, followed by training on how to measure the correct anthropometric, socialization TIPS, and explain how to use TIPS. The Stunting Detection mat is a modification of the mats made by the Ministry of Health by adding a measuring scale in centimeters (cm). Apart from being able to quickly detect stunting, this mat can also assist cadres in measuring body length.

The population in this study were all posyandu (integrated healthcare center) cadres in Kalipare District. According to the 2019 Kalipare District Health Profile data, the number of Kalipare District cadres is 430 from 86 posyandu. The sampling technique used was purposive sampling according to the village midwife with the criteria of having never attended TIPS cadre training. Based on these criteria, 50 posyandu cadres were selected from 9 villages in the Kalipare District to attend the training. Then cadres with high (scores 8-10), medium (scores 5-7), and low (scores 0-4) scores were selected, and a total of 25 people were to be observed during the training. The selected cadres measured 1-3 babies or toddlers who had previously measured before attending the training. In total, we measured 51 toddlers.

The intervention process carried out is as follows (Figure 2).

Before receiving the intervention, health cadres were asked to measure the weight/height of 3 children who were suspected of being stunted. Furthermore, health cadres were asked to take part in training on stunting held by researchers. Follow-up evaluations were carried out at several posyandu (integrated healthcare centers) to see directly the cadre's technique in anthropometric measurements using the measuring scale on the TIPS.

The variables studied were Height Body and nutritional status. Height Body measurement is done by using TIPS. Furthermore, the determination of nutritional status is determined based on the results of Height Body measurements. Research activities included direct observation of posyandu cadres to obtain primary data regarding the anthropometric measurement methods that have been carried out by cadres so far.

Paired t-tests were conducted to compare the results of Height Body measurements by cadres before and after training. An unpaired t-test was conducted to compare the results of Height Body measurements by cadres both before and after training with the results of Height Body measurements by medical profession students. Meanwhile, the Kappa test was carried out by calculating the value of the agreement on the results of determining nutritional status by posyandu cadres after receiving training in anthropometry using TIPS with junior doctors. The resulting agreement is expressed by the Kappa value based on the calculation formula:

$$K = \frac{P_o - P_e}{1 - P_e}$$

**Information :**  $P_o = P_{11+P_{22}}$   $P_e = P_{1P_1+P_2P_2}$

*K : nilai Kappa*

The Kappa value used to determine the strength of agreement/reliability is a diagnostic test recommended by Landis and Koch [7]. 40 less, 0.41-0.60 Moderate, 0.61-0.80 good, 0.81-1.00 very good (very good agreement). A reliable Kappa value to use is between 0.61-1.00.

## RESULTS AND DISCUSSION

Based on Table 1, the majority of toddlers are female, while the average of age is 21 months (min-max = 3 – 60 months). The most of toddlers come from Putukrejo Village.

In general, from the results of observations, it was found that were several mistakes often made by cadres when measuring the height of children, even though they had received training on how to measure correctly. Some of these errors are as follows:

1. The cadre forgets to straighten the toddler's legs, so the toddler's position tends to be tilted and not perpendicular to the floor.
2. Cadres tend to rush to see the measurement results while the toddler's position is still not straight inaccurate measurement results obtained
3. Babies who are fussy/uncoordinated greatly affect the accuracy of the measurement results. Often making measurements of height and weighing does not work effectively.
4. Height measurement is carried out by only one cadre, so the measurement results are not quite right.

However, the graph calculating the difference in the average Height Body by cadres before and after training can be seen in Figure 3.

The results of the paired t-test showed that the average Height Body measurement by cadres before training was 76.09. While the average Height Body measurement by cadres after training was 77.15. The significance value obtained in the paired t-test was 0.009 so it can be said that there is a significant difference between the average measurement of Height Body by cadres before being given training and after being given training.

From the results of the researchers' observations, for measuring height, there were still some cadres whose height measurements had different results from measurements taken by medical profession students. This happened because the cadres forgot to remove the toddler diapers when they were about to be measured and the cadres were also seen in a rush when taking the measurements.

In testing the comparison of the average Height Body measurement by cadres and medical profession students, an average difference of 1.176 was obtained for the average cadre measurement before training with medical profession students and a difference of 1.47 for the difference in cadre measurements after training with measurements made by doctors young (see Figure 4 for the average value).

In the independent t-test, the significance value of the difference in the average measurement by cadres before training with medical profession students was 0.634, while the significance value of the difference in the average measurement of Height Body by cadres after training with medical profession students was 0.950. Both of these values have a p-value > 0.05, so it can be concluded that there is no significant difference between the average Height Body measurements of cadres before training and after training with junior doctors.

In table 2, measurements in the Very Short (VS) category were carried out by cadres of as many as 11 infants/toddlers, while measurements by medical profession students 2 out of 11 infants/toddlers were in a short category, measurements in the Short (S) category were carried out by cadres as many as 20 infants/toddlers while measurements by medical profession students 2 out of 20 babies/toddlers are in the normal category. In the normal category measurements, cadres and doctors had the same results, namely 20 infants/toddlers. In the results of the kappa test, the value of the kappa test was obtained  $p = 0.877$  ( $p < +1$ ), which means a very good agreement.

In the anthropometric measurement process to find out the results of the measurements of Posyandu cadres for toddlers are the same as or close to the results of measurements carried out by junior doctors, a Kappa test is carried out. In the results of the Kappa test, the Kappa test value was obtained as  $p = 0.877$  ( $p < +1$ ), which means a very good agreement. It can be concluded that the skills of cadres in terms of anthropometric measurements are the same as or close to the results of measurements made by medical profession students.

In this study, we emphasized skills by comparing the results of height measurements by health cadres and co-assistant (henceforth called coass). In this study, we found no difference in the anthropometric skills of health cadres both before and after receiving training. However, the results of the cadre's anthropometric measurements after the training showed results that were more in line with the results of the coass' measurements. In general, existing studies measure changes in the knowledge level of cadres. Research conducted by Isni [8] and Putri et al [9] showed an increase in cadre knowledge after receiving training in anthropometry.

In general, from the observations, the researchers found that several mistakes were often made by the cadres when measuring the height of children, even though they had received training on how to measure correctly. Errors as described earlier often result in measuring height and measuring weight not working effectively; there is only one cadre that measures height, so the measurement results are not quite right.

Skills are the result of repeated training, in the form of increasing a person's technical abilities. Skill improvement can be seen from the increase/progressiveness of one's abilities after participating in certain activities. Skills in this study were seen by observation and direct interviews with research subjects which showed an increase in the skills of posyandu cadres in measuring the body length and height of toddlers and determining the nutritional status of stunting in toddlers (observation results) [10]. Good skills in monitoring toddler height are included in non-financial factors that can boost the performance of posyandu cadres [11].

### CONCLUSIONS AND SUGGESTION

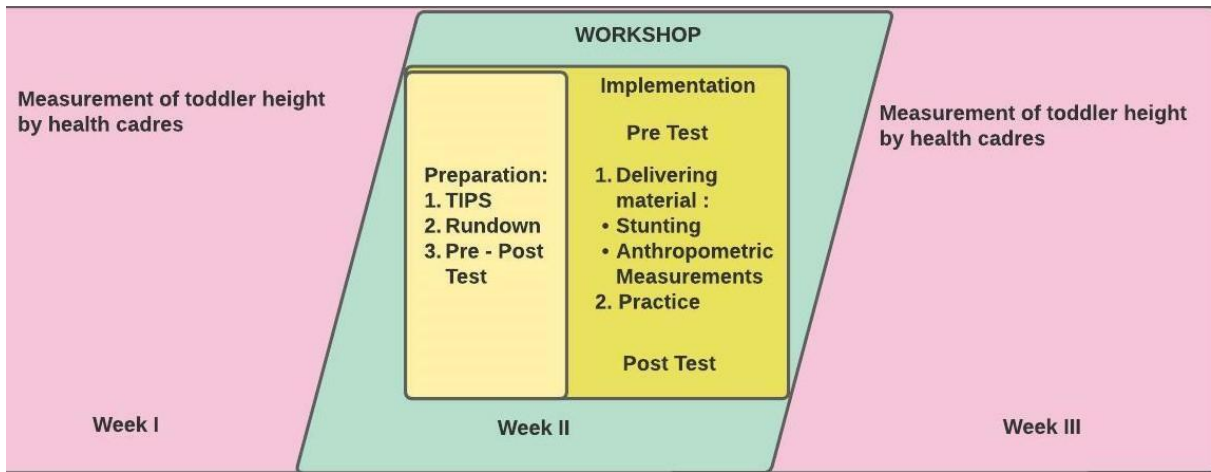
From the anthropometry training with TIPS, it is found that several cadres were able to take measurements correctly. This matter was indicated by the measurement results that were the same or close to the measurement taken by medical profession students. We suggest the Kalipare Health Center can conduct periodic evaluations of all posyandu cadres in the Kalipare District regarding anthropometric skills so that anthropometric measurement errors can be avoided, the Kalipare Health Center ensures that the quality of measuring instruments at the Posyandu is still suitable for use, and the Kalipare Health Center ensure that that the cadres who measure the height have done it according to the standard.

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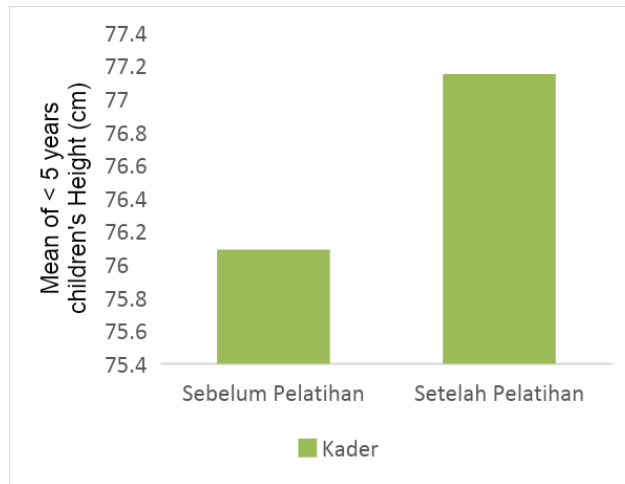
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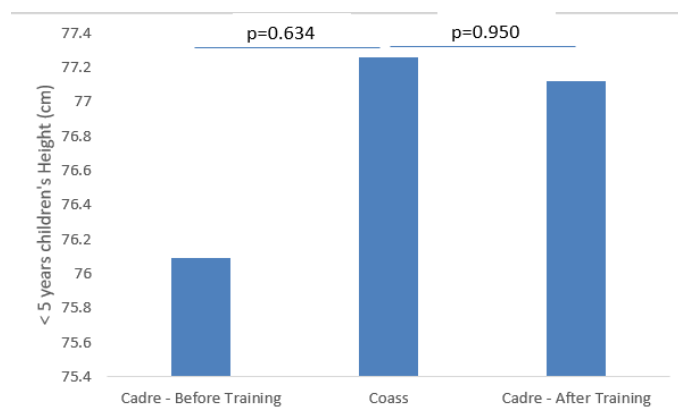
Figure 1. Tikar Pendeteksi Stunting (TIPAS)/ Stunting Detection Mat



**Figure 2.** The Process of Training for Health Cadres (Posyandu)



**Figure 3.** Graph of Average Measuring Results of TB by Cadres Before and After Training (p=0.009)



**Figure 4.** Graph of Comparison of Average TB Measurements by Cadres with Measurements by medical profession students

**Table 1.** Socio-Demographic Characteristics of Toddlers

Variable	n (51 cadres)	%
<b>Village Origin</b>		
Arjowilangun	5	9.80
Arjosari	6	11.76
Kalisari	6	11.76
Sumber Petung	6	11.76
Kalipare	6	11.76
Sukowilangun	6	11.76
Putukrejo	10	19.61
Tumpakrejo	6	11.76
<b>Sex</b>		
Male	19	37.25
Female	32	62.75
<b>Age (Months)</b>		
Min - Max	3-60	
average	21.1	

**Table 2.** Results of Nutrition Status Crosstabs by Cadres Compared by Medical Profession Students

		Nutrition Status by Students			Total
		VS	S	N	
Nutrition Status by Cadre	VS	9	2	0	11
	S	0	18	2	20
	N	0	0	20	20
Total		9	20	22	51

Kappa test value = 0.877

Note: VS (very short), S (short), N (normal)