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Implementation of PAUD Children's Nutrition Anthropometry Pocket Book Improving Teachers' Ability to Assess Children's Nutritional Status in Bali Province

Ni Nengah Ariati[1]*, Ni Komang Wiardani[1], A.A. Ngurah Kusumajaya[1], I Wayan Juniarsana[1], Ni Luh Suriani[2], Ni Made Rai Suarni[2], Ni Gusti Ayu Manik Ermayanti[2]
[1] *Lecturer of Nutrition Department Polytechnic of Health Denpasar*
[2] *Biology Study Program, Faculty of Mathematics and Natural Sciences, Udayana University, Bali, Indonesia*

Corresponding Author: Ni Nengah Ariati, E-mail: ariatinengah@ymail.com

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ABSTRACT

The physical and psychological development of preschool-age children is very rapid so the nutritional needs to support their growth and development must be met so that children do not experience malnutrition. One of the efforts to monitor children's growth is to assess their nutritional status. Early Childhood Education Programs named PAUD and PAUD Children's Anthropometry Pocket Book helps teachers assess children's nutrition. The study used a different-subject design which was carried out in April-October 2022 by randomly selecting 31 PAUD teachers in Bangli Regency as the Control Group and Tabanan as the Treatment Group. The data collected includes sample identity and teachers' ability to determine nutritional status using BW/A, H/A, BW/H, and BMI/A pre and post-treatment. Data were descriptively and statistically evaluated. Independent samples t-test at 0.05 on homogeneous data and Man Whitney test on inhomogeneous data. After receiving the intervention, Treatment Group instructors were better able to assess the nutritional status of children than Control Group teachers. The increase before and after the intervention in the control group with BW/A index of 26.8±24.2, H/A 28.0±27.4, BW/H 38.6±6.5, and BMI/A 19, 3±22.8, while in the Treatment Group the increase in BW/A index was 73.2±22.5, H/A 74.2±17.5, BW/TB 65.4±19.6, and BMI/ A 72.5±18.9. Statistical analysis with Independent Sample T-test data on BW/A and BMI/A and Man Whitney analysis on H/A and BW/H data obtained p value 0.05, which means there is a significant difference in the ability of teachers in the Control and Treatment Groups to assess nutritional status with the Index BW/A, BMI/A, H/A, and BB/H after receiving the intervention.

1. Introduction

One of the health and social problems faced by Indonesia is the low nutritional status of the community. This can be seen in various nutritional problems that occur in Indonesia such as malnutrition, iron deficiency anemia, disorders due to iodine deficiency and lack of vitamin A. Undernutrition can be found in every community group. Preschoolers have rapid physical and psychological growth (Proverawati, 2009). Children are at risk for malnutrition and overnutrition. Malnutrition/poor nutrition in children under five can hinder their development, causing unfavorable effects in the following life such as intellectual decline, disease vulnerability, decreased productivity, and the risk of giving birth to babies with low birth weight (WHO, 2020).The trend of nutritional problems in Bali between 2015 and 2017 was as follows: 1) cases of malnutrition/lack of malnutrition experienced a very small decline, from 9.0% (2015) to 8.6% (2017); 2) thin/wasted cases increased by 5.9% (2015) to 6.3% (2017); and 3) short/stunting cases experienced a very small decline, from 20.7% (2015) to 19.0% (2017). (Dinkes Prov Bali, 2017). The 2018 Riskesdas findings for stunting in Bali Province were 21.8%, distributed as 12.1% in Gianyar Regency, 16.2% in Tabanan, 20.5% in Buleleng, 21.4% in Klungkung, and 25.2% in Badung, Karangasem 26.2%, Jembrana 29.1%, Bangli 43.2%, and Denpasar City 18.2%. In 2013, the incidence of stunting in Indonesia decreased from 37.2% to 30.0%. (Dinkes Prov Bali, 2018).

The nutritional health of preschool-aged children is an essential fact that instructors and parents must be aware of. Preschool children's growth and development must be considered because malnutrition that occurs during this golden age is irreversible (cannot be cured) (Supariasa, 2012). The first one thousand days of a child's life are crucial to his future development. To combat stunting, malnutrition, and malnutrition, the community, particularly those directly involved in child care, such as PAUD teachers and parents, must be taught on the significance of nutrition and monitoring children's nutritional status.

Quality PAUD is an institution that can play a role and help in solving children's nutritional problems. Indonesian Government Regulation No. 60 of 2013 concerning Integrative Holistic Early Childhood Development explains that holistic stimulation services include education, health, nutrition, care, care, protection, and welfare services. Taking this into account, a PAUD/TK teacher must have knowledge of nutrition and health as well as the ability and expertise to monitor children's development by weighing children's weight and measuring children's height regularly, and interpreting the data from these measurements so that they can determine the nutritional status of children.

PAUD teachers in Gianyar Regency and Denpasar City have weighed and measured the height of their children, but no one has evaluated nutritional status to estimate the child's growth, according to preliminary investigations. They did not analyze nutritional status after interviewing kindergarten teachers since they did not know how to measure children's growth. The PAUD Child Nutrition Anthropometry Pocket Book, a translation of the Regulation of the Minister of Health of the Republic of Indonesia Number 2 of 2020 concerning Child Anthropometry Standards, was developed to address these issues and has been piloted with several PAUD teachers in the city of Denpasar. Therefore, the PAUD Children's Nutrition Anthropometry Pocket Book can be used to determine the nutritional status of children and is straightforward to use. Several PAUDs in Gianyar Regency have also implemented the same measures so that they can readily and accurately examine the nutritional condition of children and diagnose nutritional disorders in children at an early stage.

Based on this description, the Pocket Book on Nutrition Anthropometry for Early Childhood Education is widely used to help teachers in Bali assess the nutritional status of children.Implementation of the Anthropometry of Early Childhood Nutrition Anthropometry Pocket Book (Implementation of the Anthropometry of Early Childhood Nutrition Anthropometry Pocket Book) in Bali Province.

2. Methodology

This investigation is an experimental study with a randomized pre- and post-test control group design (Pocock, 2008; Thomas and Nelson, 1996). The study was done from April to October 2022 by randomly selecting 31 PAUD instructors who met the inclusion criteria from Bangli Regency as the Control Group and Tabanan as the Treatment Group (Purposeful Random Sampling). The sample inclusion criteria were as follows: 1) PAUD teachers with permanent or contract/honorary teaching status who had worked for at least one year; 2) physical and mental health; and 3) willingness to be a research subject, as shown by the completion of an informed permission form. Data were collected before and after the application of the model to the control group and treatment group (pre and post). The control group utilized a traditional model, namely the WHO-NCHS standard table of nutritional status, while the treatment group utilized the Child Nutrition Anthropometry Pocket Book. To determine the difference in the effect of treatment on the control and treatment groups (pre and post), an Independent samples t-test was performed at a significance level of = 0.05 on homogeneous data and a Man-Whitney difference test was performed at a significance level of = 0.05 on heterogeneous data.

3. Results and Discussion

3.1. Sample Characteristics

The features of the analyzed sample included age, degree of education, and PAUD teaching experience. Table 1 shows the characteristics of the sample based on age and total work experience.

Table (1) Sample Characteristics Based on Age and Experiences

No	Details	Group	n	Mean	DS	Min	Max
1	Age	Control	31	42,4	8,6	23	56
		Treatment	31	40,5	10,2	21	58
2	Work Experiences	Control	31	14,8	7,5	1	33
		Treatment	31	11,0	6,8	2	30

Table 1 indicates that the average age of the samples in the Control and Treatment Groups is still within the productive age range, with the lowest and maximum ages not differing significantly. The sample job experience averaged 14.8 years in the Control

Group and 11.0 years in the Treatment Group, with the greatest work experience in the Control Group being 33 years and the greatest work experience in the Treatment Group being 30 years.

While the characteristics of the sample based on the level of education are described in Table 2.

Table (2) Characteristic Sample Based on Education Level

No	Education Level	Control Group		Treatment Group	
		n	%	n	%
1.	Senior High School	8	25,8	10	32,3
2.	Diploma	0	0,0	5	16,1
3.	Bachelor (S1)	23	74,2	16	51,6
	Total	31	100,0	26	100,0

Table 2 shows the education level of the sample is Bachelor (S1) which is 74.2% in the Control Group and 51.6% in the Treatment Group.

b. Ability of the sample to assess nutritional status

Several indices, including BW/A, H/A, BW/H, and BMI/A, determined the sample's ability to evaluate the nutritional status of children in this study. Per index, a descriptive analysis comprising the mean and standard deviation/standard deviation, as well as an analysis of the various tests using the Independent samples t-test and the Man Whitney test at a significance threshold of =0.05, is then provided.

1) BW/A Index

The BW/A index is a growth indicator utilized to evaluate children that are underweight, very underweight, or overweight (overweight and obese). Table 3 demonstrates the analysis of the sample's capacity to assess nutritional status based on the BW/A index in the control and treatment groups.

Table (3) Descriptive Analysis and Test of Data Differences in the Ability of Samples to Assess Nutritional Status with BW/A Index in Control and Treatment Groups

No	BW/A Index	Control Group	Treatment Group	t	p
1.	Pre	9,7±15,3	9,6±15,2	0,000	1,000
2.	Post	36,5±21,3	82,9±16,2	-9,650	0,000
3.	Enhancement	26,8±24,2	73,2±22,5	-7,814	0,000

The study of the Independent Sample-t-Test difference test of pre (before intervention) data in the Control and Treatment Groups indicates that there was no significant difference (p>0.05), suggesting that the beginning conditions in the Control and Treatment Groups were identical. There was a statistically significant difference between post-data (after intervention) and growing scores (pre-post) in the control and treatment groups (p0.05).

2) H/A Index

The H/A index describes the growth in height of a youngster relative to his age.

This index can identify children who are short (stunted) or extremely short (severely stunted) as a result of chronic malnutrition or frequent sickness. Table 4 presents descriptive analysis and several assessments of the sample's capacity to measure nutritional status using the H/A Index.

Table (4) Test Results of Data Differences in the Ability of Samples to Assess Nutritional Status with H/A Index in the Control and Treatment Group

No	H/A Index	Control Group	Treatment Group	t/Z	p
1.	Pre	3,8±7,2	3,8±7,3	0,000	1,000
2.	Post	31,8±27,7	78,0±17,8	-5,435	0,000
3.	Enhancement	28,0±27,4	74,2±17,5	-5,578	0,000

The study of the Independent Sample-t-Test of pre (before intervention) data in the Control and Treatment Groups demonstrates that there was no significant difference (p>0.05), indicating that the beginning conditions in the Control and Treatment Groups

were identical. The Man Whitney test (=0.05) revealed a statistically significant difference (p0.05) between post data (after intervention) and increasing scores (pre-post) in the control and treatment groups.

3) BW/H Index

The BW/H index indicates if a child's weight is proportional to his increase in height. Table 5 contains descriptive analysis and various test data about the sample's capacity to identify nutritional status based on the BW/H index.

Table (5) Test Results of Data Differences in the Ability of Samples to Assess Nutritional Status with BW/H Index in the Control and Treatment Group

No	BW/H Index	Control Group	Treatment Group	t/Z	p
1.	Pre	7,6±11,2	9,2±12,0	-0,545	0,588
2.	Post	46,2±38,4	74,6±14,7	-2,774	0,006
3.	Enhancement	38,6±36,5	65,4±19,6	-3,200	0,001

The study of the Independent Sample-t-Test of pre (before intervention) data in the control and treatment groups revealed no significant difference (p>0.05), indicating that the beginning conditions in the control and treatment groups were identical. The Mann-Whitney test (=0.05) revealed a statistically significant difference between post-data (after intervention) and increasing scores (pre-post) in the Control and Treatment Groups (p0.05).

4) BMI/A Index

The BMI/A index is used to assess the categories of inadequate nutrition, inadequate nutrition, adequate nutrition, at danger of overnutrition, overnutrition, and obesity. As indicated in Table 6, descriptive analysis and various test results on the sample's capacity to identify nutritional status based on the BMI/A index.

Table (6) Test Results of Data Differences in the Ability of Samples to Assess Nutritional Status with BMI/A Index in Control and Treatment Group

No	BMI/A Index	Control Group	Treatment Group	t/Z	p
1.	Pre	9,7±12,7	7,6±11,2	0,699	0,487
2.	Post	29,0±18,7	80,1±14,4	-12,038	0,000
3.	Enhancement	19,3±22,8	72,5±18,9	-10,007	0,000

The independent sample t-test examination of the pre-intervention data for the control and treatment groups revealed no significant difference (p>0.05) in Table 6, indicating that the beginning conditions for the control and treatment groups were identical. The Mann-Whitney test (=0.05) revealed a statistically significant difference between post-data (after intervention) and increasing scores (pre-post) in the Control and Treatment Groups (p0.05). The research subjects were PAUD teachers in the Province of Bali, namely Tabanan and Bangli Regencies who were still actively teaching in PAUD with a minimum of one year's work experience totaling 31 people each in the Control and Treatment Groups. The mean age of the sample was 42.4±8.6 years in the control group and 40.5±10.2 years in the treatment group. The age of the sample in the study is a productive age who can achieve maximum work performance. The youngest age of the sample is 21 years and the oldest is 58 years.

In the Control Group, the average sample job experience was 14.87.5 years, while the average sample work experience in the Treatment Group was 11.06.8 years. Work experience is one of the external elements that might influence a person's skills and knowledge. The longer a person has worked, the more proficient he will be at his job. Teachers with significant experience in the classroom also have a solid understanding of child development (Astiti and Budisetyani, 2013).In this study, the average work experience was >10 years, but the sample's ability to assess nutritional status before being given an intervention in the Control and Treatment Group was classified as lacking. This is because they have never been exposed to how to assess the nutritional status of children. A similar study in Gianyar Regency also found an average PAUD teacher with work experience of >10 years with the ability to assess nutritional status before being given an intervention in the Control and Treatment Group was also classified as lacking (Ariati, et.al, 2021). In the Regulation of the Minister of Health Number 66 of 2014, it is stated that the Monitoring of Growth, Development, and Developmental Disorders of Children is carried out in basic health service facilities and in kindergartens organized by Kindergarten teachers in collaboration with parents of students and health workers (Kemenkes RI, 2020). Seeing these regulations, a PAUD teacher should master how to assess a child's nutritional status, so that socialization and training on how to determine a child's nutritional status with the implementation of a child anthropometry pocketbook are felt to be very beneficial for them because it increases their knowledge in the field of Health and nutrition.

Data collection on the education level of the sample found that the education level of the sample started from Senior High School, Diploma, and Bachelor (S1). Education is one of the internal elements that influence a person's knowledge/ability, which in this

instance is the capacity to evaluate the nutritional state of youngsters. A person's understanding will be broader and it will be easier for him to acquire new material/information imparted during training if he has a higher degree. This can be seen from the results of data collection on the ability to assess nutritional status before being given an intervention, all samples (100%) were classified as lacking, and after being given intervention in the Control and Treatment Groups there was an increase to enough and good, with higher scores in the Treatment Group. Knowledge does not come by itself but is sought through the learning process. The knowledge provided is very important to improve a person's quality so that he can improve his ability to do a job. The knowledge possessed by a person will affect his actions and behavior. Someone who has good knowledge will act better, while someone with less knowledge will generally act less well.

The ability of the sample to assess the nutritional status of children with an index of BW/A, H/A, BW/H, and BMI/A got an average increase in the Control Group with an index of BW/A 26.8±24.2, H/A 28, 0±27.4, BW/H 38.6±36.5, and BMI/A 19.3±22.8. While in the Treatment Group, there was a higher average increase, namely the BW/A Index 73.2±22.5, H/A 74.2±17.5, BW/H 65.4±19.6, and BMI/A 72.5±18.9. The Independent Sample T-test on BMI/A and BW/A data as well as the Mann-Whitney analysis on H/A and BW/H data revealed a significant difference (p0.05) between the control group and the treatment group in the ability of the sample to assess nutritional status after receiving the intervention (post-test). The increase in the Treatment Group sample's capacity to determine the nutritional status of children was significantly greater than that of the Control Group. The study of the average increase using the Independent Sample T-test for BW/U and BMI/U data and the Mann-Whitney test for H/A and BW/H data revealed a statistically significant difference (p0.05). Similar research on PAUD instructors in Gianyar Regency in 2021 revealed a significant difference in the ability of teachers in the Control Group and Treatment Group to assess nutritional status using the BW/A, H/A, H/W, and BMI/H indices after receiving an intervention (post) (Ariati, et.al, 2021).

In both the control and treatment groups, the ability of samples to determine nutritional status increased. This is because, before to the intervention, individuals had never been exposed to or trained to evaluate nutritional status, therefore they just responded. Previously, in school, just height and weight measurements were taken, with no evaluation of the child's nutritional health. The assessment was guided by the availability of assistance in the form of anthropometric tables in the control group and anthropometric pocketbooks in the treatment group. To make it easier for the sample to assess the nutritional health of children, presentations and training on how to utilize the tables and pocketbooks have been offered. Teachers must become accustomed to analyzing children's nutritional status so that they are more familiar with and able to utilize the anthropometric tables and graphs provided in anthropometric pocketbooks, making it easier to monitor children's nutritional status.

The increase in the sample's capacity to assess nutritional status was greater in the Treatment Group than in the Control Group, since the anthropometry pocketbook was provided instructions for calculating nutritional status using graphs, making it simpler to assess nutritional status in the sample. While in the Control Group using the tables listed in the Anthropometric Standards, the number and characteristics of the tables are quite large, causing the sample to be confused and frequently select the incorrect table. In addition, the sample must compare the numbers listed in the table with the standard standards in order to determine whether the nutrition is good, less, or bad. The problem of using tables is that the sample is frequently confused in selecting the proper table, frequently forgets it, and does not even comprehend the standard. The availability of media in the form of books along with training can enhance the sample's knowledge and abilities (PAUD teachers). The average increase in the ability of PAUD instructors in Gianyar Regency to assess nutritional status was greater in the Treatment Group, which received training using an anthropometry pocket book for PAUD children, than in the Control Group, which received instruction using anthropometric tables (Ariati, et.al, 2021).

Another training on stimulation for kindergarten teachers to get emotional intelligence training stimulation affects the skills of kindergarten teachers in stimulating emotional intelligence in early childhood (Sariri, 2015). Research that provided the training was also carried out by Rahayu and Purnamasari to find that there was a significant difference in the knowledge of PAUD teachers in conducting SDIDTK before and after being given SDIDTK application training (Rahayu and Purnamasari, 2019). At different levels of educators, Juanita, et.al, 2019) provided training on the use of presentation applications with Microsoft PowerPoint to PKBM Negeri 27 Petukangan teachers who found an increase in teacher skills at PKBM Negeri 27 Petukangan after receiving training. 50% of teachers agreed that the content of the training material was clear and easy to understand, 62% strongly agreed that the exercise examples were clear and easy to understand, and 50% agreed that the instructor and assistant instructors helped participants understand the material well (Juanita, et.al, 2019). This shows that training will be able to help students' understanding so that they can improve their knowledge and skills.

4. Conclusion

The increase before and after the intervention in the control group with BW/A index of 26.8±24.2, H/A 28.0±27.4, BW/H 38.6±6.5, and BMI/A 19, 3±22.8, while in the Treatment Group the increase in BW/A index was 73.2±22.5, H/A 74.2±17.5,

BW/TB 65.4±19.6, and BMI/ A 72.5±18.9. Statistical analysis with Independent Sample T-test data on BW/A and BMI/A and Man Whitney analysis on H/A and BW/H data obtained p value 0.05, which means there is a significant difference in the ability of teachers in the Control and Treatment Groups to assess nutritional status with the Index BW/A, BMI/A, H/A, and BB/H after receiving the intervention.

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