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THE EFFECT OF WATER ACTIVITY AND FOOD CONSUMPTION ON PSYCHOSOCIAL DISORDER AND ANTHROPOMETRIC STUNTING TODDLERS

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Abstract
Stunting is still found in the city of Surabaya, especially in the Putat Jaya sub-district area. There are many ways to overcome and reduce the occurrence of stunting. One of them is doing water activities. The aim of this research is to find out whether there is an influence of water activities and food consumption on psychosocial disorders and anthropometry of stunted toddlers. This research used a one group pre-test and post-test design with a sample size of 7 toddlers and sampling used purposive sampling. Height and weight measurements were taken before and after water activities. Meanwhile, to look at food consumption and psychosocial disorders, the data collection technique is in the form of a questionnaire. The results of the study showed that anthropometric values between height and weight had increased compared to psychosocial disorder values. Apart from that, there is a significant difference between the pretest and posttest height of stunted toddlers. The significance value for pretest height is 0.430 and posttest is 0.437 (Sig. >0.05). Then it was also proven by the Paired Sample T-test of 0.029 (Sig. <0.05), this means that there is a difference between pretest and posttest body height. Meanwhile, for body weight and psychosocial disorders, the pretest and posttest did not prove to be a significant difference. Apart from that, water activities can increase appetite. In this study, all toddlers were not identified as having any psychosocial disorders. However, the reality in the field is that there are still stunted toddlers who are afraid of doing water activities or getting introduced to water. Further studies regarding implementation and better measurement procedures are needed in future research.

Keywords: *Water Activities, Food Consumption, Psychosocial Disorders, Anthropometry, Stunting.*

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INTRODUCTION

Stunting is an unresolved problem in Indonesia. Indonesia is ranked fifth in the world for the number of children with stunting (Ningrum et al., 2020). The

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city of Surabaya is the city with the lowest number of stunting cases in East Java. This is shown by data from the Indonesian Nutrition Status Study (SSGI) of the Indonesian Ministry of Health (Kemenkes), the prevalence rate of stunting in the city of Surabaya has decreased significantly. In 2021, the prevalence reached 28.9% (6,722 children under five), in 2022 it decreased significantly to 4.8% (923 children under five). However, the reduction in the prevalence of stunted toddlers has not been achieved and is not evenly distributed in the Surabaya City area (Mukodi & Rahmawati, 2023). One example is in the Putat Jaya sub-district area. According to the 2020 Surabaya City Health Service Report, stunting was still found in the Putat Jaya Health Center work area reaching 19.89% (Aprilia & Tono, 2023).

Toddlers are a very important golden age period and need special parental attention. Toddlers aged 12 - 24 months are prone to illness caused by infection or nutritional status disorders, because at that age the toddler is going through the process of transition from baby to child (Tsaralatifah, 2020). Toddlers who frequently experience illness will have an impact on their growth because illness will be followed by a decrease in appetite (Damayanti et al., 2017). Toddlers who experience stunting until the age of 5 years are more difficult to correct and will continue into adulthood, this will cause the risk of offspring with Low Birth Weight (LBW).

he mother's role is very important in overcoming nutritional problems in children, especially in terms of family nutritional intake, starting from preparing food, choosing food ingredients, to the food menu (Apriluana & Fikawati, 2018). Fulfillment of nutritional needs by parents will influence subsequent eating habits. Food provision must pay attention to the quantity, quality and safety of the food provided. Toddlers need more protein for growth. If a child has difficulty eating, it can cause malnutrition, dehydration, underweight, impaired cognitive development, anxiety disorders and conditions that can be life threatening. In Surabaya, malnutrition status is still found, especially in Putat Jaya Subdistrict,

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Surabaya. According to the 2022 Indonesian Nutrition Status Survey, the prevalence of wasting under five in the city of Surabaya is 6.1%. The wasting rate in the city of Surabaya is below the national and provincial average. Meanwhile, the prevalence of underweight toddlers in the city of Surabaya is 7.5%, this prevalence figure is below the average prevalence. East Java Province, namely 15.8%. According to data from the Ministry of Health in 2023, wasting and underweight figures in the city of Surabaya have a prevalence below the national and provincial averages. The Surabaya City government continues to make every effort to reduce the number of nutritional problems (Idris, 2022).

In addition to nutritional problems, psychosocial factors such as limited play activities, mother-child interactions, and child-child interactions are negatively related to the developmental outcomes of children in extreme poverty. Experiencing adverse psychosocial conditions during childhood can have a particularly negative impact on the language development and behavior of exposed children (Worku et al., 2018). Psychosocial aspects of parenting are an important factor in cognitive development (Ernawati & Arini, 2020). The parenting style carried out between mother and child in honing the child's abilities is an absolute requirement to ensure harmonious growth and development both physically, mentally and psychosocially (Widiyanto & Gamelia, 2017). The influence of psychosocial stimulation on toddlers is very large, this can determine the toddler's abilities at each stage of development (Agustin & Rahmawati, 2022). The psychosocial development of toddlers consists of developmental tasks and developmental aspects. The developmental aspect consists of 8 aspects, namely motoric, cognitive, language, emotional, personality, moral, spiritual and social aspects. Every child has development. physical, cognitive, social and moral aspects of ability that are unique and interconnected with one another. Children who receive care with poor psychosocial aspects have lower cognitive development compared to children who receive good care (Ernawati & Arini, 2020). In cases of stunting, children have a higher risk of experiencing

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psychosocial dysfunction compared to children in normal conditions (Purnamasari, 2022).

Children who suffer from stunting tend to choose physical activities that expend little energy (Santi Wijayanti et al., 2022). Treatment for stunted toddlers is by doing physical activity. One of the physical activities that toddlers can do to prevent stunting is water activities. From a psychological point of view, water activities can reduce mental tension and anxiety (Petrescu et al., 2014). Water activities are physical activities that are suitable for fighting disease, creating a state of physical and psychological comfort, and can provide a good mood in social or professional activities. Apart from that, water activities also make it possible for children to interact with new people who have similar abilities to themselves, develop new things, skills, and socialize (Sinclair & Roscoe, 2023).

Based on the description above, researchers want to know the effect of water activities and food consumption on psychosocial disorders and anthropometry of stunted toddlers in Putat Jaya sub-district. The selection of the Putat Jaya sub-district as the area to be researched was based on data from the Putat Jaya sub-district health center which was known to have a stunted toddler rate of 13 children and the local government opened up opportunities to receive programs that could improve the condition of toddlers in the area. This research aims to determine the influence of water activities and food consumption on psychosocial disorders and anthropometry of stunted toddlers in the Putat Jaya sub-district, Surabaya City. This research is expected to increase mothers' knowledge about the importance of nutrition and healthy food to prevent stunting in children, provide guidance for Posyandu cadres in efforts to prevent stunting, and provide insight for toddlers to involve themselves in physical activities that are beneficial for their health and growth.

METHOD

The type of research used in this research is quantitative descriptive research which is carried out to create an objective picture of a situation. The data

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collection technique is in the form of a questionnaire or questionnaire. The research design is "one group pretest and posttest design". The population is 13 stunted toddlers from Putat Jaya Village, Surabaya City, aged 12-59 months. A sample of 7 toddlers was selected using a purposive sampling technique with the criteria being 2-4 years old and willing to take part in a water activity program.

The data collection technique in this study began by obtaining informed consent from the parents of toddlers who met the age criteria of 2-4 years and were willing to measure their height, weight, and participate in a water activity program after a verbal explanation of the research objectives. Then the water activity program is carried out once a week for six weeks to see changes in height and weight before and after the program. Next, parents fill out the Visual Comstock Form to assess the toddler's food consumption level based on food waste which is estimated visually, recorded as a percentage, and data taken once every six weeks. The PSC-17 questionnaire is filled out by parents and teachers to evaluate the toddler's mood and behavior before and after the program, with the weighted scores added together to get the total score of the relevant subscales.

The data analysis technique uses SPSS version 26 software. Descriptive analysis is carried out to describe the existing data. Next, a normality test was carried out using the Shapiro Wilk test if the sample was less than 100, and the Kolmogorov Smirnov test if the sample was more than 100, to evaluate the data distribution. The decision of the normality test is determined based on the significance value, where if the value is more than 0.05, the data is considered to be normally distributed.

Next, a hypothesis test was carried out using Paired Sample T-test parametric analysis to answer the research questions. This test is used to compare the average between pretest and posttest. The hypotheses used are Ha (there is a mean difference) and Ho (there is no mean difference). The decision for this test is taken based on the significance value (Sig.), where if Sig. < 0.05, then Ho is rejected and Ha is accepted, indicating there is a significant difference between

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the pretest and posttest. Meanwhile, if Sig. > 0.05, then Ho is accepted, indicating there is no significant difference between the pretest and posttest.

RESULT AND DISCUSSION

The following is research data from the variables studied which are presented in the table below:

Table 1. Respondent Characteristics

Characteristics of Toddlers	N = 7	
	n	%
Age (months)		
24-36	3	42,9
36-48	2	28,6
48-60	2	28,6
Gender		
Male	5	71,4
Female	2	28,6
Characteristics of Toddler Parents		
Mother's Education		
Finished elementary school	1	14,3
Finished junior high school	1	14,3
Finished high school	5	71,4
Mother's Job		
Housewife	4	57,1
entrepreneur	1	14,3
Private Employee	2	28,6
Family Income		
1.200.000 – 2.500.000	4	57,1
2.500.000 – 4.000.000	1	14,3
> 4.000.000	2	28,6

The results of the frequency distribution analysis based on the characteristics of toddlers showed that most respondents were toddlers aged 24-36 months (42.9%) and male (71.4%). Meanwhile, based on the characteristics of parents of toddlers, it shows that the majority of mothers' education levels are high school (71.4%), and the majority work as housewives (57.1%) and have family incomes mostly in the range of 1,200,000 – 2,500,000 (57 .1%).

Table 2. Stunting Toddler Z-Score Data

Pretest	**N = 7**		
	Z-Score	**n**	**%**
Weight/Height Category			
Risk of Overnutrition	> +1 SD sd +2 SD	1	14,3
Poor Nutrition	< -3 SD	2	28,6
Malnutrition	-3 SD sd < -2 SD	3	42,9

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Good Nutrition	-2 SD sd +1 SD	1	14,3
TB/U category			
Short	-3 SD sd <-2 SD	7	100
Posttest			
Weight/Height Category			
Risk of Overnutrition	>+2 SD sd +3 SD	1	14,3
Poor Nutrition	<-3 SD	2	28,6
Malnutrition	-3 SD sd < -2 SD	1	14,3
Good Nutrition	-2 SD sd +1 SD	3	42,9
TB/U category			
Very Short	<-3 SD	1	14,3
Short	-3 SD sd <-2 SD	6	85,7

Table 2 shows the pretest and posttest Z-score data for stunting toddlers. In the pretest, the percentage of stunted toddlers with BB/TB in the risk category for overnutrition was 14.3%, malnutrition 28.6%, undernutrition 42.9%, and good nutrition 14.3%. All stunted toddlers in the TB/U category show very short status. In the posttest, the percentage of toddlers with overweight/TB undernutrition remained at 14.3%, undernutrition was 28.6%, undernutrition decreased to 14.3%, and good nutrition increased to 42.9%. The TB/U category showed 14.3% very short and 85.7% short.

Table 3. Descriptive Analysis of Psychosocial Disorders

	N	Min	Max	Med	Mean	Std. Dev
Pre-Psychosocial	7	0	9	2	4	3,605
Post-Psyhosocial	7	1	8	2	3,2	2,627

Table 3 shows data on psychosocial disorders before and after intervention. In the pretest, the minimum score was 0 and the maximum score was 9. The median score was 2, and the average was 4 with a standard deviation of 3.605, indicating a negative result. In the posttest, the minimum score is 1 and the maximum is 8. The median score is 2, and the average is 3.2 with a standard deviation of 2.627, also indicating a negative result.

Table 4. Descriptive Anthropometric Analysis

	N	Min	Max	Med	Mean	Std. Dev
Pre-TB	7	82	98	89	90	6,457
Post-TB	7	83	98	90,7	90,7	6,106
Pre-BB	7	8,5	16,2	11,5	11,5	2,490
Post-BB	7	8,4	16,6	11,5	11,7	2,580

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Based on Table 4, it shows anthropometric data for height and weight before and after the intervention. For height, the minimum pretest score is 82 and posttest is 83, with a maximum score of 98 for both tests. Median pretest height was 89 and posttest was 90.7. The average height of the pretest was 90 and the posttest was 90.7. The posttest height standard deviation (6.106) was lower than the pretest (6.457). Meanwhile for body weight, the minimum pretest score was 8.5 and posttest was 8.4, with maximum scores of 16.2 and 16.6 respectively. Median pre-posttest body weight was 11.5. The average pretest weight was 11.5 and posttest was 11.7. The posttest standard deviation of body weight (2.580) was higher than the pretest (2.490).

Table 5. Height and Weight Normality Test

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
TB Pretest	0,176	7	0,200*	0,915	7	0,430
TB Posttest	0,169	7	0,200*	0,916	7	0,437
BB Pretest	0,225	7	0,200*	0,928	7	0,538
BB Posttest	0,221	7	0,200*	0,931	7	0,563

Based on Table 5, it shows that the pretest and posttest height data are normally distributed. Apart from that, the pretest and posttest weight data were normally distributed because the significance value was greater than the significance level value (Sig > 0.05).

Table 6. Psychosocial Disorder Normality Test

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Psycho Pretest	0,282	7	0,098	0,882	7	0,235
Psycho Posttest	0,402	7	0,001	0,750	7	0,013

Table 6 shows that the pretest psychosocial disorder data is normally distributed because the significance value is greater than the significance level (>0.05) while the posttest psychosocial disorder data is not normally distributed because the significance value is <0.05.

Table 7. Hypothesis Test Paired Sample T-test

			Paired Differences					t	df	Sig. (2-tailed)
			Mean	Std. Dev	Std. Error Mean	95% Confidence Interval of the Difference				
						Lower	Upper			
Pair	TB	*pre-*	-	0,596	0,225	-1,194	-0,090	-	6	0,029

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1	*post*	0,642					2,850		
Pair 2	BB *pre-post*	-0,142	0,229	0,086	-0,355	0,069	-1,644	6	0,151
Pair 3	Psycho *pre-post*	0,714	2,058	0,778	-1,189	2,618	0,918	6	0,394

Based on Table 7, it is known that the height hypothesis Ho is rejected and Ha is accepted, while the weight and psychosocial disorder hypothesis Ho is accepted and Ha is rejected.

Discussion

The results of the descriptive analysis of psychosocial disorder for the average pretest score were 4 and the average posttest score was 3.2. Then the results of the descriptive anthropometric analysis of body height for the pretest average value were 90 and the posttest average value was 90.7. Meanwhile, weight anthropometry for the pretest average value was 11.5 and the posttest average value was 11.7. So it can be concluded that the values for height and weight have increased compared to the values for psychosocial disorders.

In the results of the normality test, researchers obtained data that the significance value of the pretest height data in the Shapiro Wilk test was 0.430 > 0.05, so the distribution was normal. Meanwhile, the posttest height data in the Shapiro Wilk test was 0.437 > 0.05, so it was normally distributed. Furthermore, the pretest weight data in the Shapiro Wilk test was 0.538 > 0.05, so it was normally distributed.

Meanwhile, the posttest weight data in the Shapiro Wilk test was 0.563 > 0.05, so it was normally distributed. So it can be concluded that there is a significant difference between body height and weight. Then the pretest psychosocial disorder data on the Shapiro Wilk test is 0.235 > 0.05, so the distribution is normal. Meanwhile, the posttest psychosocial disorder data in the Shapiro Wilk test was 0.013 < 0.05, so it was not normally distributed.

Furthermore, the results of the hypothesis test using the Paired Sample T-test, the researcher obtained Pair 1 value data of 0.029 < 0.05 so that Ho was rejected and Ha was accepted, so it can be concluded that there is a significant difference between pretest and posttest height. Meanwhile, the data value for Pair

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2 is 0.151 > 0.05 and the value for Pair 3 is 0.394 so that Ho is accepted and Ha is rejected, so it can be concluded that there is no significant difference between body weight and psychosocial disorder pretest and posttest.

(Santos et al., 2023) in his article entitled "Effects of Exposure to Formal Aquatic Activities on Babies Younger Than 36 Months". The results showed that the water activity program was beneficial in reducing various neuromuscular delays and disabilities as well as relieving pain and improving the sleep-wake cycle in newborns. The factors considered to be the most influential in water activities, especially in the early stages, include age, physical, motor, mental, social development and environmental conditions. The fear of losing balance in the water is quite a big problem. Individuals who are shorter and have lower body mass have higher fear due to poorer body buoyancy, making it difficult to perform buoyancy recognition exercises in water. A person's self-confidence in their ability to survive is needed to overcome fear of water, making it easier for children to start learning to swim (Ostrowski et al., 2022).

Research results (Leo et al., 2022) show that water activities can influence early motor development in babies and toddlers. The results of the study provide further evidence of the potential influence of water activities on the motor development of young children, showing that babies or toddlers in the experimental group, although younger than children in the control group, achieved a higher level of motor development. After participating in water activities compared with the results of the control group.

Food consumption factors can also influence food waste. Decreased preference for the taste of food can interfere with a toddler's appetite, resulting in leftover food, weak physical condition allows symptoms of lack of appetite, behavior and eating patterns can also affect leftover food (Shapiro et al., 2019).

To reduce the prevalence of stunting requires increasing the quantity and quality of food consumed by mothers during pregnancy and breastfeeding, as well as the food given to babies and children in the first 5 years of life. Animal source

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foods have been proposed as a means of increasing macro and micronutrient consumption in early childhood. WHO has long recommended that children aged >6 months consume varied and sufficient amounts of meat, poultry, fish or eggs, as well as fruits and vegetables rich in vitamin A (Shapiro et al., 2019). Furthermore, many studies have investigated the effects of exercise (especially water activities) on appetite. Water activity is an effective physical activity to encourage a person to move more for health and reduces the risk of disease. Empirical evidence shows that water activities can increase appetite, and increase body mass loss. Water activities can stimulate hunger thereby encouraging energy intake after exercise (Grigg et al., 2023).

Based on the results of the scores from filling out the PSC-17 data questionnaire, it was found that toddlers were not identified as having any psychosocial disorders. The results of research from (Pratt et al., 2023) show that there is water activity intervention on children's basic movement skills and motor competence. Children who have participated in water activity programs (relaxing swimming, swimming lessons after school, etc.) show optimal motor development. There are various aspects that influence children's water activity abilities including: swimming pool accessibility, fear of drowning, parents who are afraid of water make their children discouraged from learning to swim. The results of other studies show that regular water activity practice affects the development of fine motor skills (eye and hand coordination) and gross motor skills (reflexes). Apart from that, children's internal emotions involve interactions with the outside world, parental figures are also the starting point for these interactions (Leo et al., 2022). The first year of life is a quite critical period for children, who have the opportunity to absorb many important inputs for their physical and mental growth.

CONCLUSION

Based on the research results, toddler anthropometry, such as height and weight, has increased, while psychosocial disorders show stable values. A significant difference was found between body height before and after water

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activity treatment. This is caused by age, physical, motoric, mental, social and environmental development which greatly influence the effectiveness of water activities for toddlers. In addition, water activities increase children's appetite, which is reflected in the results of observations of food waste. Even though psychosocial disorders have not been identified, there are still challenges in the field related to the reluctance of some stunted toddlers to participate in water activities.

Researchers advise parents to choose water activities to reduce the risk of stunting and improve toddlers' movement skills. Institutions and cadres are expected to work together to reduce stunting through support for intervention programs. It is recommended that future researchers improve the water activity program to increase understanding of toddler development and deal with the problem of stunting more effectively.

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