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Research Article

The Effect of Date Palm (*Phoenix Dactylifera*) Juice to Prevent Stunting

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Abstract

Aims: One of the problems due to lack of chronic nutrient intake in toddlers is stunting. Stunting can be prevented by fulfilling nutritional intake with nutrient-rich foods such as date juice, because date juice is a good source of carbohydrates, amino acids, minerals, and dietary fiber to meet the body's nutritional needs, especially in toddlers. This study aims to determine the effect of date juice on the prevention of stunting in children under five.

Methods: The research design used was quasi-experimental with a two group Pretest-Posttest control group design. A total of 78 children under five who were measured for length and weight consisted of 34 people in the intervention group by giving date juice and 34 people in the control group without giving date juice.

Result: The study was conducted for 3 months. After the intervention, the average body length and body weight in the intervention group increased to 12.91 for body length and 87.67 for body weight. While body length and body weight in the control group did not experience significant changes. The results of the paired t test showed a significant p-value of (<0.05) while in the control group the p value was > 0.05, meaning that there was no change in body length and body weight in the control group.

Conclusion: This study shows that date juice has an effect in preventing stunting. Based on the results of this study, nurses need to maximize stunting prevention education by meeting nutritional needs by consuming nutrient-rich foods such as date juice.

Keywords:

Date Juice, Stunting, Toddlers

INTRODUCTION

Stunting is caused by a lack of nutritional intake during the first 1000 days of life, which is a critical period. Stunting in toddlers is a manifestation of chronic nutrient deficiencies, both pre and post-natal. Stunting is a chronic nutritional problem experienced by toddlers around the world. In 2017, around 150.8 million toddlers in the world were stunted, more

than half of the stunted toddlers in the world came from Asia (55%) while more than a third (39%) lived in Africa (1). The prevalence of stunting in Indonesia tends to fluctuate, the results of Riskesdas in 2007 showed the prevalence of stunting in Indonesia was 36.8%, increasing to 37.2% in 2013. Although in 2018 the prevalence of stunting at the national level showed a decrease of 6.4% to 30.8%, the figure is still far from the World Health Organization

(WHO) target of 20% (1). Central Sulawesi Province according to the 2018 Riskesdas mentioned the problem of stunting at 21.4% and the number of stunting in Poso District was 21.8% (2). Stunting is defined as a condition of toddlers who have less length or height compared to age. This condition is measured by length or height \leq -2 to -3 standard deviations (3). The direct causes of stunting are nutrient deficiencies and infectious diseases, while the indirect causes are family food security, parenting and family diet, as well as environmental health, and health services. Meanwhile, the basic causes of stunting consist of education, poverty, socio-culture, government policies, and politics (4). Stunting is a condition of growth failure in children under five years of age (toddlers) due to chronic malnutrition and repeated infections, especially in the First 1000 Days of Life period. Stunting can cause toddlers to experience growth disorders, experience obstacles in cognitive and motor development, and have a greater risk of suffering from non-communicable diseases such as diabetes, obesity, and heart disease as adults (5). Nutrient intake with good quality and quantity is needed especially at the age of toddlers, because toddlers are in a period of rapid physical and cognitive growth and development. The intake of nutrients needed by the body is obtained from macronutrients such as energy, carbohydrates, protein and fat. Macronutrients are nutrients that are needed in large quantities by the body and mostly play a role in providing energy, growth and development. While the intake of micronutrients is needed a little in the body but its function cannot be replaced by other nutrients so that its needs must be fulfilled in the daily diet (6). Food diversity will ensure the availability of various nutrients for the body to carry out its functions, which is also one way to improve stunting conditions. Supplementary feeding can help fulfill nutrient intake in the short term, without reducing the consumption of a variety of foods that contain balanced

nutrients every day. Dates are one of the fruits commonly consumed by the community. Date fruit is the fruit of the Phoenix dactylifera plant which has seeds with one institution. Dates contain a lot of carbohydrates, fats, proteins, various minerals and vitamins and have a fairly high fiber content (7).

Date palm fruit is frequently consumed by the people due to its great nutritional value (8). The results indicate that dates are healthy and can serve as a source of growth-promoting nutrients. According to additional studies, dates are an excellent source of carbs, amino acids, minerals, and dietary fiber for addressing the nutritional demands of the body (9). Dates are also abundant in flavonoids and phenolics, which have powerful antioxidant effects and are therefore beneficial for disease prevention. In Indonesia, a large quantity of date juice is produced. Date juice consists of crushed dates from which the juice is extracted. Date palm juice is beneficial for children under the age of five since it includes numerous nutrients essential for growth (10). Dates in the exchange food are included in the fifth group, namely the group of fruits, which one exchange unit contains 50 calories, 10 grams of protein and 12 grams of carbohydrates (11). Date juice is a date that is mashed and taken juice. Date juice is liquid with a thick consistency, black in color and tastes very sweet and contains complete nutrients such as dates. This study aims to assess the effectiveness of Healthy Dates (date juice) and multivitamins on height correction for stunted toddlers.

METHODS

Study Design

This study utilized a quasi-experimental two-group pretest-posttest control design. The pre-measurement as a baseline of intervention and control groups conduct before the intervention. After the intervention procedure was complete, the researcher took the post-test for both

groups. This study utilized a quasi-experimental two-group pretest-posttest control design: the control group and the intervention group. In this design, height and weight measurements were taken twice: before (the pre-test) and after (the post-test) administration of the therapy.

Population and Sample

The population of this study were children under five in the Tangkura Health Center working area. The total population in this study was 214 people, and using purposive sampling obtained 78 samples. Respondents in the intervention and control groups totaled 34 people. This study employed purposive sampling with the following inclusion criteria: samples aged 24-36 months, willing to consume date palm juice, residing in the study area, and willing to be samples. Children who did not enjoy drinking date palm juice were ineligible to participate in the study. The intervention group received date juice intervention and the control group did not receive any intervention. At the end of this study, researchers gave date juice to the control group. In this study, no respondents dropped out

Prosedure

The intervention group consumed date juice every day in the morning and at night for 3 months as much as 1 tablespoon.

Instrument

The instruments in this study used a microtoice to measure body length and a weight scale to measure body weight.

Analysis

The data normality test consists of three common tests that are often used by researchers, namely the Shapiro-Wilk test. The results of the normality test showed that the data were normally distributed with a p-value > 0.005, so the data analysis in this study used the Paired sample t-test test This research has passed the research ethics test issued by the Research Ethics Commission of the Poltekkes Kemenkes Palu, with number: 0067/KEPK-KPK/IV/2022.

This study was designed to examine the effect of date juice on the prevention of stunting as measured by , height and weight in toddlers prior to and following administration of date juice. Based on the findings of the normality test, the statistical test utilized is the paired sample T test because the data are normally distributed. This study was conducted using a pre-test to measure height and weight, followed by the administration of palm juice and a post-test to measure height and weight again to see whether there was an increase.

RESULTS

From March to September 2022, researchers directly measured the length and weight of the samples before and after the administration of date juice. Examination of the sample's body length and weight before and after the date palm juice intervention gave the following results.

Table 1.
Distribution of Toddlers According to Age, Gender, and Exclusive Breastfeeding

Characteristics	Category	n	%
Age	24 – 35 Month	61	78,2
	36 – 48 Month	17	21,8
Gender	Male	44	56,4
	Female	34	43,6
Breastfeeding	Yes	42	53,8
	No	36	46,2
Total		78	100

Table 1 shows that out of 78 respondents, 61 people (78.2%) were 24-36 months old and 17 (21.8%) were 36-48 months old. based on gender 44 people were male (56.4%) and 34 people were female (43.6%), based on breastfeeding history 42 people (53.8%) with breastfeeding and 36 people (46.2%) did not breastfeed.

Table 1 reveals that of the 78 respondents, 61 (78.2%) were aged 24-36 months, while 17 (21.8%) were aged 36-48 months. Additionally, 44 male (56.4%) and 34 female (43.6%) were men and women, respectively.

Tabel 2.
Mean body length of toddlers in the intervention group and control group before and after the intervention.

Body length	n	Mean	SD	p
Intervention Group				
Pre	39	12,26	1,281	0,000
Post	39	12,91	1,239	
Control Group				
Pre	39	12,89	1,528	0,912
Post	39	12,90	1,526	

Table 2 shows the mean body length of the intervention group before the intervention was 12.26, with a standard deviation of 1.281 centimeters. The mean body length after the intervention was 12.91, with a standard deviation of 1.239. The paired T-test results showed a p value = 0.000 (<0.05). In contrast, the average body length of the control group at the first measurement was 12.89, with a standard deviation of 1.528 centimeters after the re-measurement, the average body length was 12.90 with a standard deviation of 1.526. In the control group, the results of statistical analysis using the paired T test showed a value of p = 0.912 (p> 0.05). Based on the results of the analysis, it can be concluded that there is a difference in average body length between the intervention group and the control group, which indicates that the provision of date palm juice can increase the body length of toddlers and prevent stunting in toddlers.

Table 3.
Average body weight of toddlers in the treatment group and control group before and after intervention

Body Weight	N	mean	SD	p
Intervention Group				
Pre	39	86,82	5,323	0,003
Post	39	87,67	5,358	
Control Group				
Pre	39	16,09	1,985	0,696
Post	39	10,57	1,182	

Table 3 shows that the average body weight before date juice administration in the intervention group was 86.82 pounds with a standard deviation of 5.323. After the administration of date palm juice for three months, the average weight value was 87.67 with a standard deviation of 5.358. Statistical analysis using the paired T test in the intervention group resulted in a p value = 0.003 ($p < 0.05$) indicating that H_a is accepted, which indicates that date palm juice has an influence on children's weight gain. The average body weight in the control group at the first measurement was 16.09 and a standard deviation of 10.57. In the control group, statistical analysis using the Wilcoxon test resulted in a p value = 0.696 ($p > 0.05$). Based on the results of the analysis, it can be concluded that there is an effect of giving date palm juice on the body weight of toddlers.

DISCUSSION

Date fruits are often consumed by people because of their high nutritional value (12). Research results show that dates are healthy and can be a source of nutrients that help growth (13). According to other studies, dates are a good source of carbohydrates, amino acids, minerals, and dietary fiber to meet the body's nutritional needs. Dates are also rich in flavonoids and phenolics, which have strong antioxidant properties and are beneficial for disease prevention. In Indonesia, date juice is produced in large quantities. Date juice consists of mashed and extracted dates. Toddlers can safely consume date juice as it provides several nutrients necessary for growth. According to laboratory analysis, there are 47 mg/100 mg calcium, 511 mg/100 mg potassium, 2.67 mg/100 g zinc, 2.46 mg/100 g iron, and 0.45 mg/100 mg sodium. Dates consist of 70% carbohydrates. 100 grams of dates provide 314 calories (14). Dates also contain salts and minerals, protein (2.3-5.6%), fiber (6.4-11.5%), calcium, magnesium, phosphorus, potassium, iron, zinc, manganese, cuprum, selenium, and many vitamins. After vitamin

B2 (niacin), the largest amount of vitamin C ranges from 400 to 16000 micrograms. It is estimated that date juice with a balanced nutritional profile can reduce stunting in toddlers (15).

Dates contain protein, iron, carbohydrates, fiber, vitamins, niacin, biotin, folic acid, calcium, potassium, and sodium (13). Dates contain between 3% protein, 1% fat, and 96% carbohydrates, which provide a total of 23 calories (11). Date juice supplements vitamin intake from the daily diet, thus preventing stunting (16). Healthy Dates is rich in sugar, protein and many essential vitamins. Healthy Dates given are liquid with a thick consistency, black in color and taste sweet and contain complete nutrients such as dates. The content of nutrients in Healthy Dates serves to complement the intake of nutrients from daily food which can prevent stunting. Fatmah's research (17) shows that giving date tempe biscuits can improve the nutritional status of toddlers with tuberculosis by 0.5 kg and increase the average height by 1.7 cm, as well as research by Hidana (2018) shows that mothers who are given date juice during exclusive breastfeeding can improve the nutritional status of infants aged 0-5 months (18). Energy is needed to support growth, development, muscle activity, metabolic functions to repair damaged tissue, for the continuity of the process of circulation and blood circulation, heart rate, respiration, digestion and other physiological processes. Energy intake that does not meet the needs, causes an energy imbalance in the body, if this happens continuously, it causes nutritional problems such as chronic energy deficiency and stunting (11). In this study, energy intake was obtained from the results of 1x24 hour recalls 4 times, energy source foods that are often consumed by toddlers come from rice, and processed soybeans. The results of the analysis using Nutrisurvey showed that the energy adequacy rate in the Healthy Data group was 54.12% (severe deficit) and in the multivitamin group was 51.10% (severe deficit). Research by Ayuningtyas et al.,

(2018) shows that energy intake affects the incidence of stunting in toddlers, ($p = 0.001$), as well as research by Anasiru & Domili, (2019) which shows that there is a relationship between energy intake and the incidence of stunting. Sangging et al. (2017) found that date palm juice can help cure ADB because it is rich in iron and vitamin C and can be added with other nutrients without causing diarrhea, nausea, or vomiting (19). For the continuity of circulation and blood circulation, heart rate, breathing, digestion, and other physiological processes, the body needs energy to support growth, development, muscle activity, metabolic functions to repair damaged tissues, circulation and blood circulation, heart rate, breathing, and digestion (15). Inadequate energy intake will cause an energy imbalance in the body, which if it continues will cause nutritional problems such as chronic energy deficiency and stunting (20). In this study, energy intake was obtained from the findings of two rounds of 24-hour recall. Rice and processed soybeans were the two most common sources of energy consumed date juice had increased height, according to the results. The results of research by Ayuningtyas et al. (2018) show that energy consumption affects the prevalence of stunting in toddlers ($p = 0.001$) (14), in line with research conducted by Anasiru and Domili (2019) showing a relationship between calorie consumption and stunting (19). According to research by A. Susilowati (2019), zinc deficiency affects the incidence of stunting in toddlers. (p -value = 0.001) (20).

Calcium is the most prevalent mineral in the body, comprising between 1.5% and 2% of an adult's body weight, or around 1 kilogram. Of this quantity, 99.9% is found in hard tissue, mainly bones and teeth, particularly in the form of hydroxyapatite (16). Calcium is widely dispersed throughout the body as bone density fluctuates with age, increasing in the early years of life and subsequently decreasing throughout adulthood (21). Calcium plays a

crucial role in extracellular and intracellular fluids in regulating cell activities such as nerve transmission, muscular contraction, blood coagulation, and cell membrane permeability. The strength and form of bones and teeth Calcium in bones serves two purposes: first, as an essential component of bone construction, and second, as a reservoir for calcium (22). Calcium's primary purpose in the body is to produce bones and teeth; enough calcium can alter bone strength and promote bone growth in accordance with this function. 18% of toddlers have calcium deficiencies (23).

CONCLUSION

Date juice has an effect on increasing body length and body weight of toddlers, which answers the research question that date juice has an effect on stunting prevention. Researchers suggest maximizing stunting control by continuing to provide foods that contain complete nutrients for toddler growth. Nurses can be more active in counseling about the benefits of date juice to meet the nutritional needs of toddlers.

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