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The Effect of Palm Sugar Water Provisions on The Fitness of Futsal Players

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ABSTRACT

The provision of carbohydrate drinks during exercise helps to improve fitness, quench thirst, and accelerate rehydration and re-energisation of the body. Athletes require higher amounts of energy than non-athletes. Based on the results of observations before the intervention (Pre-Test), the fitness level of futsal players at SMK Negeri 1 Samarinda, five respondents fell into the category of very little, and four respondents fell into the category of less. This study aims to determine the effect of giving palm sugar water on the fitness of futsal players at SMK Negeri 1 Samarinda. The research design used is a one-group pretest-posttest design with 22 male students who are members of the futsal extracurricular. This research was conducted in the futsal field of SMK Negeri 1 Samarinda in August 2024 for 3 weeks, 8 times, and data analysis using a paired T-test. The results of this study indicate that the administration of palm sugar water significantly affects fitness, P = 0.001 (<0.05). After giving palm sugar water to the fitness level of futsal players at SMK Negeri 1 Samarinda, there is a significant effect.

Keywords: futsal, palm sugar, fitness

INTRODUCTION

Exemplary sports achievements require a long process and cannot be achieved instantly; they require planned, tiered, and sustainable coaching through competitions to achieve them (Ministry of Health of the Republic of Indonesia, 2014). Physical fitness is one of the main aspects that athletes must possess. By having a good level of physical fitness, humans will find it easier to do their activities or work. On the other hand, with a low level of physical fitness, humans will have difficulty carrying out all daily activities. This is due to the importance of the role of physical fitness in human life (Darmawan, 2017).

Physical activity will run well with adequate nutritional intake and body composition. Fulfilling the needs of nutrients will impact achieving good nutritional status. (Kusumaningtyas, 2015). According to Pinem (2013), Palm brown sugar has a high amount of simple carbohydrates. These simple sugars include glucose, sucrose, and fructose, making brown sugar a category of energy producers in the body. Palm brown sugar also contains essential minerals needed for metabolic processes and optimizing the work of muscles, heart, and lungs, such as calcium (Ca), phosphorus (P), iron (Fe), and copper (Cu). Some sources also mention that brown sugar has a low glycemic

index. According to Tanuwijaya et al. (2017), Giving carbohydrate drinks during exercise helps improve fitness, quench thirst, and accelerate rehydration and replenishment of energy for the body. The administration of carbohydrates is also known to inhibit the occurrence of fatigue.

Futsal is one of the major football sports that demands high physical ability and cardiorespiratory endurance. The most dominant energy system characteristic used in futsal is the anaerobic energy system. The main factor needed is a level of physical condition with good fitness to carry out futsal activities without experiencing excessive fatigue (Ninzar, 2018).

Carbohydrates are the most important energy source that athletes need when doing activities, namely, simple and complex carbohydrates. The two types of carbohydrates have different digestive processes. Complex carbohydrates take a long time to produce energy, while simple carbohydrates take a shorter time. (Jufri, 2022).

METHOD

This study was prepared as pre-experimental quantitative research with a pretest-posttest one-group design. The research was carried out by conducting a fitness test using *the Harvard step test* technique before and after the administration of palm sugar water. The population in this study is all male students in grades X to XII of SMK Negeri 1 Samarinda who are members of the futsal extracurricular.

In this study, the researcher took samples by measuring height and weighing to determine the nutritional status of students who were members of futsal extracurriculars before the intervention. Fitness level measurements are carried out before palm sugar water is given. Giving palm sugar water to futsal players in the same way every training day for 3 weeks, with eight doses. Every week, students are given palm sugar water 3 times. The palm sugar water solution consists of 21 grams of palm sugar dissolved in 250 ml of water. Palm sugar water is given 20 minutes before routine exercise activities. In the eighth administration, palm sugar water was given 20 minutes before the fitness level measurement.

RESULTS AND DISCUSSION

1. Respondents' Characteristics

Respondent characteristics include age, nutritional status of respondents, which can be seen in Table 1:

Table 1. Respondents' Characteristics

	Respondents' Characteristics	Frequency (n)	Percentage (%)
1)	**Respondents' Age**		
	14-15	7	31,8

	16-17	14	63,6
	18-19	1	4,6
	Nutritional Status		
2)	Severely thinness	0	0
	Thinness	0	0
	Normal	22	100
	Overweight	0	0
	Obese	0	0
	Physical Activities		
3)	Heavy	0	0
	Medium	22	100
	Light	0	0
	Total	22	100

Based on Table 1, it was found that the characteristics of most respondents were between 16-17 years old, as many as 14 people (63,65%), 14-15 years old, as many as seven people (31,8%), and 18-19 years old, as one person (4,6%). Based on the characteristics of the respondents' nutritional status and physical activity, it is known that all respondents are included in the categories of nutritional status, both (100%) and moderate physical activity (100%).

The aging process affects individuals in several ways, including a decline in physiological conditions that reduces the capacity of natural body systems, organs, and functions (Bintang, 2020). A person's fitness level peaks around the age of thirty and decreases, on average, by 0,8–1% per year with age, especially in the case of less active individuals (Yusri et al., 2020).

According to previous research conducted by Putro and Winarno (2022), nutritional status, physical fitness, and balanced food intake can help maintain a person's physical fitness condition. A balanced nutritional status has an impact on a person's level of physical fitness. There is a correlation between a high body mass index and obesity, which impacts activity restrictions. This leads to a low level of physical fitness. The nutritional status of each participant in this study was considered normal. (Sulistiono, 2014).

In Table 1, the respondents' physical activity is classified as medium. This is in line with research conducted by Adhianto (2023), Namely, the more physical activity a child does, the greater the benefits for improving fitness levels. Unstrong relationships can be attributed to several things, including lifestyle, education, environment, physical characteristics, and hereditary factors. (Adhianto, 2023). Cardiorespiratory endurance, namely aerobic and anaerobic endurance, is a component of physical fitness needed to play futsal. Aerobic endurance is needed to produce explosive movements that require bursts of energy when playing futsal (Badaru & Sufitriyono, 2021).

2. Overview of Fitness Level Before and After Palm Sugar Water Treatment

Table 2. Average fitness level before and after treatment

	Mean ± Std. Deviation		*p-value*
	Before Administration	**After Administration**	
21 grams of palm sugar in 250 mL of water	66,868 ± 20,7795	78,168 ± 8,2921	0,001

Based on Table 2, it was found that the fitness level of the sample before the administration of palm sugar water obtained an average value of 66,868. After the administration of palm sugar water, the fitness level had an average value of 78.168 with *a value of p=0.001. Because of the p<0.05 value*, it can be concluded that there is a significant difference between the level of fitness before and after the treatment of giving palm sugar water to futsal players at SMK Negeri 1 Samarinda.

In the results of the respondents' fitness level after being given palm sugar water, there were respondents whose fitness level decreased. Before being treated with palm sugar water, the fitness level of the respondents was excellent. After treatment, the level of fitness decreased to good. This is likely to occur due to sleep. Endocrine and metabolic processes are affected by the length of sleep. The inability to get enough sleep can lead to reduced glucose tolerance and decreased insulin sensitivity, increasing the likelihood of arteries becoming stiffer. Over time, this condition will lead to excessive fatigue, which will ultimately have an impact on decreased physical fitness. (Putra, 2019).

Based on the study's results on the effect of giving palm sugar water on the fitness of futsal players at SMK Negeri 1 Samarinda, the average score of the fitness level of futsal players before the administration of palm sugar water was 66,868. The average fitness level increased to 78,168 after being given sugar water. From the statistical test results, it can be concluded that there is a change or difference between the pretest and posttest values (p value = 0.001 or p value < 0.05). This shows a significant influence of palm sugar water on fitness.

This research is in line with the research of Akbar (2019), who found that consuming palm sugar before exercising significantly impacts the body's immune system. The theory behind this study is that palm sugar, which is composed mainly of glucose, is a carbohydrate used in energy metabolism, especially during aerobic or long-lasting activity.

Tanuwijaya's (2017) research also supports the findings of this study, which shows that the administration of palm sugar water can improve physical fitness. The primary source of energy for athletes when they exercise is carbohydrates. During physical activity, the body uses glucose and glycogen stored in the muscles and liver to produce ATP as energy for the body. The four types of carbohydrates are identified based on the number of simple sugars that make up their molecules: monosaccharides, disaccharides, polysaccharides, and oligosaccharides. The sugar most easily

absorbed by the body of the four categories is called a monosaccharide. As a natural sweetener that belongs to the class of monosaccharides, palm sugar is easily absorbed by the body and easily converted into energy (Clemens, 2016).

CONCLUSION

The results of the identification of the fitness level of the sample before the administration of palm sugar water obtained an average score of 66,868. After administering palm sugar water, an average score of 78,168 was obtained. There was a significant difference between the fitness level before and after the treatment of giving palm sugar water to futsal players at SMK Negeri 1 Samarinda. This research is expected to be used as information for further research and for future researchers to develop research variables or additional grants.

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