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THE IMPACT OF NUTRITIONAL STATUS ON THE VERTICAL JUMP PERFOMANCE ATHLETES

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Abstract
Volleyball is a team game played by two teams with six players in each team. It is played by volleying the ball back and forth over the net and each team tries to quickly drop the ball into the opponent's court with a perfect ball bounce. Mastery of technique, physical ability, good tactics and mentality, as well as cooperation are needed to win the game. The aim of this observation was to measure Body Mass Index (BMI) and nutrition in Sky Club volleyball athletes. This research uses a qualitative descriptive method, qualitative descriptive aims to systematically explain events that are currently occurring by emphasizing the disclosure of data based on facts obtained from the field. The results of this observation show that the Sky Club volleyball athletes have an average Body Mass Index (BMI) value in the Normal criteria. This shows that the Langit volleyball athletes do not have problems with nutrition, because they have a good diet and balanced training patterns. If it is not balanced with a programmed diet and exercise pattern, growth, in this case Body Mass Index (BMI), will be disrupted. The nutritional status of athletes at Club Langit is good, there are only a few athletes whose nutritional status is not normal, and this can all be influenced by several factors such as meal portions, lack of nutrients (carbohydrates, protein, fat, etc.) and inappropriate training. to the needs of athletes. Coaches must pay more attention to providing training progress to athletes, so that there are no more problems with nutritional status to improve the performance of Club Langit athletes. The Body Mass Index results at the Langit club were 71.47% in the Normal category and this is quite a good result. This correlates when the athletes do the vertical jump, they will be very light when doing it.
Keywords: *Volleyball, Observation, BMI, Nutrition, Vertical Jump*

INTRODUCTION

Sports are a series of physical activities that are organized and carried out in a planned manner to improve physical fitness, involving various body movements, exercises, or games. The purpose can include improving strength, endurance, flexibility, and overall health. In addition to being done individually, sports can also be performed in groups and involve various disciplines such as athletics, fitness, or team sports. To maintain good physical health and as a way to cope with the physical demands of modern life, engaging in sports activities can be very helpful.

Volleyball is a team sport that involves two teams, each consisting of six players. In this game, the ball is hit back and forth over a net, and each team tries to land the ball in the opponent's area with precise bounces. Good technique, physical condition, strategy, strong mentality, and solid teamwork are all essential to achieving victory. This sport was invented by William G. Morgan in 1895. He was a physical education instructor at the Young Men's Christian Association (YMCA) in Massachusetts, United States.

According to (Agusman et al., 2023), volleyball is an official indoor sport regulated by the FIVB. In this game, two teams of six players each compete on a small court measuring 18 x 9 meters, separated by a net. (Astuti et al., 2022) stated that volleyball is an activity that requires good aerobic capacity, jumping skills such as in blocking, necessary strength, and agility. In recent years, the Langit volleyball club has experienced a decline in performance and has struggled to even reach the quarterfinals in several tournaments. One of the causes of this issue is nutrient deficiency among the athletes.

As a result, they are unable to perform optimally during matches. Many people are unaware that the profession of a nutritionist is not limited to treating sick individuals or those in need of a special diet plan. In reality, nutritionists are also involved in other fields, including sports. Inadequate nutrient intake can lead to negative outcomes (Ramdani, 2020). Therefore, athletes require proper nutritional management to enhance their performance during training and competitions. In the book Nutrition for Sports, it is explained that athletes need different nutrition compared to regular individuals, due to differences in physical activity types and mental conditions.

Each sport has its own specific nutritional needs, even though the overall goals are similar: to maintain energy balance required for metabolism, bodily functions, and energy supply during rest, training, and competitions. Different nutrients serve different functions in the body. For example, carbohydrates act as the main energy source for muscles and the nervous system, which are essential for muscle coordination. The importance of healthy living through exercise and nutritious food should not be underestimated. Each nutrient plays a vital role in

maintaining body health, from early life to adulthood. Balanced nutrition is key to a healthy and high-quality life. From initial interviews, it was found that the athletes do not fully understand what constitutes healthy and nutritious food. They tend to choose foods based on their personal preferences without paying attention to the principles of nutritional balance. This may result in some athletes having poor or suboptimal nutritional status. Every day, volleyball players engage in physically demanding activities, which require a balanced energy intake.

According to Supariasa (Ningrum & Susanto, 2023), Body Mass Index (BMI) is an easy method to monitor nutritional status, especially in relation to being overweight or underweight. Therefore, the researcher is interested in examining the nutritional status and BMI of volleyball athletes from the Langit club, with the aim of identifying what is lacking and what is needed by their bodies to prevent malnutrition and help them achieve optimal performance, both at the regional and national levels. The researcher relates the BMI results with the vertical jump performance of the Langit volleyball athletes and found variations in vertical jump results among the athletes, which are influenced by the differences in their Body Mass Index (BMI).

METHOD

This survey was conducted at the Langit volleyball club court. The research was carried out according to the training schedule provided by the coach. This study used a qualitative descriptive method, which aims to systematically describe current events by emphasizing the presentation of data using numbers and facts obtained from the field. The research involved collecting data through observation and interviews as data collection tools. The subjects of the study were the volleyball athletes of the Langit club.

Vertical jump is the ability to jump as high as possible from a standing position with straight legs. This ability is often required in various types of sports such as basketball, volleyball, or athletics. According to Reza Adhi Nugroho and Aditya (Gumantan & Nugroho, 2020), a vertical jump is a type of physical fitness exercise performed by jumping vertically without a preliminary step, aiming to reach maximum height.

Tabel 1. Norma Lompat Tegak (Vertical Jump) Laki-laki (dalam inch)
Note : 1 inch = 2,54 cm

NORM	AGE									
	9	10	11	12	13	14	15	16	17	18>
Excellent	16"	16"	16"	20"	20"	20"	25"	25"	25"	26"
Good	14"	14"	14"	17"	17"	17"	23"	23"	23"	24"
Average	11"	11"	11"	14"	14"	14"	19"	19"	19"	19"
Poor	9"	9"	9"	11"	11"	11"	12"	12"	12"	13"
Very Poor	4"	4"	4"	5"	5"	5"	5"	5"	5"	8"

(Sumber:Johnson & Nelson, 2000)

The observations and interviews included questions such as age, height, and weight. Afterward, the data were used to calculate the Body Mass Index (BMI) in order to determine whether the athletes' nutritional status was balanced or not.

Tabel 1. BMI Classification

Classification	Body Mass Index (BMI) (kg/m²)
Underweight	BMI > 18,5 - 25,89
Normal	BMI > 18,5 - 25,89
Overweight	BMI > 25,90 - 26,99
Obesity	BMI > 27,0

(Sumber: https://www.dipopedia.com/2015/08/24-menghitung-indeks-massa-tubuh.html?m=1)

The date of the Body Mass Index (BMI) measurement was recorded, and calculations were carried out based on data obtained from observations at the Langit volleyball club, allowing for the identification of how many athletes fell into each BMI category: underweight, normal, overweight, and obese.

This research was conducted in the Langit volleyball club court in the afternoon during training sessions. Out of a total of 90 athletes, 50 were selected as research samples. The first data collection technique involved measuring the athletes' height and weight. The second was collecting data on the athletes' vertical jump results. For the data analysis technique, the BMI calculation results were compared with the vertical jump performance results.

RESULTS AND DISCUSSION

Tabel 3. Vertical Jump Test Results

Age	Number	Category
14 Years	10	Very Good

16 Years	13	Good
12 Years	17	Fair
11 Years	5	Por
9 Years	5	Very Poor

This study was conducted to determine the nutritional status and Body Mass Index (BMI) data of volleyball athletes at Langit Club. Based on the analysis conducted by the researchers, the research data were presented in percentages. The results of the study are as follows:

Tabel 4. Distribution of Nutritional Status Frequency Data Based on BMI

Interval	Frequency	Category	Relative Frequency
BMI < 18,5	9	Underweight	18,65%
BMI 18,5 - 25,89	35	Normal	71,47%
BMI 25,90 - 26,99	6	Overweight	8,88%
BMI > 27,0	0	Obese	0%
Total	50		100%

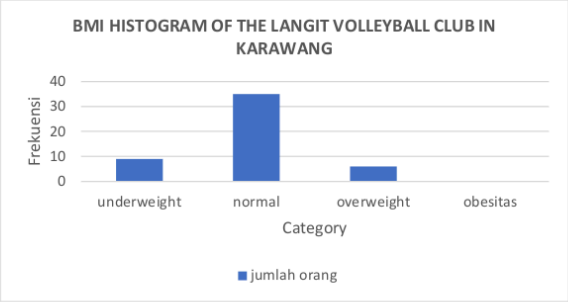

Figure 1. BMI Calculation Results

Based on Table 3, it can be concluded that the Body Mass Index (BMI) of Langit Volleyball Club athletes falls into the Normal category at 71.47%, with a frequency of 35 athletes. The Underweight category accounts for 18.65% (9 athletes), the Overweight category for 8.88% (6 athletes), and there were no athletes in the Obese category. Observational results indicate that the average BMI value of the Langit Club volleyball athletes is within the Normal range.

This suggests that the athletes do not face nutritional issues, as they follow good dietary habits supported by a structured training plan. Without a balance between diet and an organized training regimen, athlete development particularly in terms of BMI can be negatively affected.

Discussion

Based on the observations conducted at Langit Club, the researchers found that 35 athletes were categorized as Normal, 9 athletes as Underweight, and 6 athletes as Overweight. On average, the athletes' Body Mass Index (BMI) distribution was 71.47% in the Normal category, 18.65% in the Underweight category, and 8.88% in the Overweight category. This indicates that 9 athletes at Langit Club have a good nutritional profile, meaning their training and nutritional intake are balanced. However, 3 athletes were underweight due to an imbalance between nutrition and training portions, and 1 athlete was overweight due to uncontrolled food intake that did not match the body's needs.

According to (Sirada et al., 2022), balanced nutritional status is a condition of the body resulting from consuming and utilizing nutritious substances properly. To achieve training goals, optimization is necessary. Test results showed that the athletes' physical condition was good, reinforcing that a structured training process plays an essential role in shaping the athletes' physical fitness. Maintaining a good physical condition and following a training program requires attention to the athletes' nutritional status.

The study shows that when the athletes' nutritional status is normal, it serves as a critical reference in designing effective training programs. All of this is interconnected and significantly influences the performance of Langit Club volleyball athletes—affecting skills such as passing accuracy, block range, vertical jump, spike power, and serve accuracy.

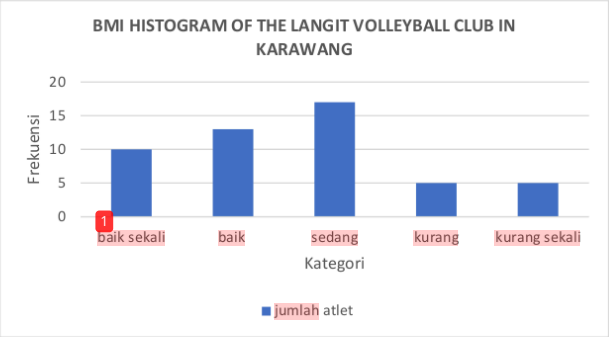

Figure 2. Vertical Jump Test Results

Based on the table above, it can be concluded that the vertical jump test results of the Langit Volleyball Club athletes were highly varied: 10 athletes were in the Very Good category, 13 athletes in the Good category, 17 athletes in the Fair category, 5 athletes in the Poor category, and 5 athletes in the Very Poor category. The researchers observed a trend where athletes with higher Body Mass Index (BMI) tended to have lower vertical jump results. This is likely due to the additional body mass placing extra load on the muscles and joints, making it more difficult to jump high. However, this relationship may not apply to everyone.

Athletes with high BMI but low body fat percentage and high muscle strength may still be capable of achieving good vertical jump performance. Meanwhile, 71.47% of Langit Club athletes were in the Normal BMI category, which is a positive result. When these athletes performed vertical jumps, they likely felt lighter during the jump. This outcome aligns well with their vertical jump test results. The relationship between BMI and vertical jump is complex and influenced by several factors, including age, gender, genetics, and body size.

Although a higher BMI is generally associated with lower vertical jump performance, this is not always the case. Improving and training leg muscle strength and explosive power can help enhance vertical jump ability. Vertical jump performance is largely supported by the primary movement muscles, especially the quadriceps femoris muscle group. Improvement in vertical jumping should be done

gradually, requiring adaptations in the quadriceps femoris, which serves as the main mover. To perform an upward jump, the muscle must contract.

Muscle tissue, composed of contractile muscle cells, generates strength. Skeletal muscles are connected through connective tissues. The key structure in skeletal muscles is the myofibril, which contains contractile protein elements that enable muscle contraction. If an individual maintains good nutritional status, the body's nutritional needs will be met, allowing it to have sufficient energy for training and competition (Saparia, 2023).

In addition, maintaining adequate hydration ensures that the body has enough fluids to function properly, such as for effective metabolism and oxygen delivery from the lungs to all parts of the body. When there are no obstacles, a lack of nutrients especially energy and protein can lead to various problems, including stunted growth, improper weight, and abnormal height, all of which can negatively affect athletic performance.

CONCLUSION

Based on the results of this study, it can be concluded that the average Body Mass Index (BMI) status of athletes at Langit Club falls within the Normal category. Only 3 athletes were categorized as Underweight and 1 athlete as Overweight. This was due to food intake that did not meet the specific nutritional needs of the athletes.

According to (Syamsuryadin et al., 2022), a balanced nutritional status is a condition of the body resulting from consuming and utilizing nutritious substances properly. The nutritional status of athletes at Langit Club is generally good, with only a few athletes showing abnormal status. These irregularities may be influenced by several factors, such as portion sizes, insufficient intake of nutrients (carbohydrates, proteins, fats, etc.), and training programs that do not match the athletes' needs. Coaches must pay closer attention when assigning training progress to athletes, so that nutritional issues do not hinder performance improvement for Langit Club athletes.

The Body Mass Index results showed that 71.47% of Langit Club athletes were in the Normal category, which is a fairly good outcome. This correlates with

their performance in vertical jumps, where athletes felt lighter during execution. Improving and training leg muscle strength and explosive power can help enhance vertical jump ability. Vertical jump performance is primarily supported by the main body movement muscles, particularly the quadriceps femoris muscle group.

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