
Litteratur Review: The Role of Nutrition Education in Sports

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ABSTRACTS

The low level of nutritional knowledge among athletes and coaches in Indonesia is one of the main problems. Therefore, it is important to know the role of nutrition education on improvement in knowledge, attitudes, and behavior and factors which affect the nutritional knowledge of the subject. Narrative review literature has a more flexible structure. The search for the source of article was carried out using Google Scholar, Pubmed, and Elsevier using the key terms: “education” “requirement”, “nutrition status”, “nutrition”, and “athletes”. Increased knowledge, attitudes, and behavior can apply consumption patterns that can meet nutritional needs as an athlete and for coaches, officials, and administrators can provide encouragement as a peer group in implementing balanced nutrition patterns in athletes' daily lives.

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1. Introduction

One of the nation's assets that is very precious and invaluable is youth. progress of a nation depends a lot on young people who act as an agents of change. Youth is a figure who provides and continues to make changes in making this nation a quality. One way of change that youth can make in advancing their nation is engaged in sports. Sports activities are essentially a miniature of life, it is said so because in sports activities there are many health values, pleasures, free time fillers. Sport is closely related to the values of struggle, pioneering, cooperation, competition, respect, responsiveness, leadership, and decision making, honesty and sportsmanship. These are universal values embedded in sport¹.

Sports staff involved in the training carried out did not involve a nutritionist or dietitian. Nutritionists and dietitians are experts in the field of nutrition who can help athletes and training in understanding the role of nutrition in sports. One of the important factors in the success of an athlete is the fulfillment of proper nutrition, so that it is achieved excellent physical condition and optimal performance in obtaining achievements. Food supply is required for growth process and normal growth, maintaining health and well-being, reducing the risk of disease and injury, and optimizing sports performance². Besides genetic factors and an efficient training program, planning a good diet certainly really determines their performance and also determines their performance in sports.

There are several guides that have been used to planning food supply for athletes, including the Academy of Nutrition and Dietetics, Dietitians of Canada (2016) and American College of Sports Medicine (ACSM) (2016) which uses the WHO reference which categorizes athletes as very active individuals with a Physical Activity Level (PAL) of 1.8-2.3 or 2.0-2.4 for athletes in certain sports^{4,5}. The government through the Ministry of Health has issued a guideline for the 2021 Athlete Nutrition Assistance which categorizes nutritional needs by classifying nutritional needs based on the type of exercise according to the metabolic system, that is strength, endurance, and games³. Fulfillment of nutritional intake is a substantial matter for an athlete, but athletes often do not get the right nutritional supply. This is due to a lack of knowledge/understanding of nutrition among athletes, as well as a lack of nutrition education among coaches, officials, and administrators, and the lack of nutrition and health personnel involved in the development of sports achievements.

According to the Ministry of Health in 2021, athletes need to pay attention to the fulfillment of nutritional supply, especially the balance between energy intake and expenditure, good at phase before and after training or matches. A balanced nutritional supply based on individual characteristics and sports is needed to meet nutritional adequacy for exercise and improve performance. Good performance will support athletes to get the best performance. Athletes who have low nutritional knowledge are often found, not only knowledge that is out of date, selection of foods that are less varied and the number of athletes who prioritize taking supplements. Nutrition knowledge can be increased by educating athletes and coaches. With nutrition education carried out to parties related to sports activities, especially in achievement sports, it can increase knowledge, attitudes, and behavior towards the fulfillment of athlete nutrition. Knowledge improvement, attitudes, and behavior is expected to be able to apply consumption patterns that can meet nutritional needs as an athlete and for coaches, officials, and administrators are expected to provide encouragement as peer group in implementing a balanced nutritional pattern in the daily life of athletes. So that there is an awareness of the importance of nutrition in the world of sports which will have an impact on sports achievement. The low level of nutritional knowledge among athletes and coaches in Indonesia is on of the main problems. Therefore, it is important to know the role of nutrition education on

improvement in knowledge, attitudes, and behavior and factors which affect the nutritional knowledge of the subject.

2. Subjects and Methods

Various topics and methods can be explored in these review, we chose to take narrative review approach rather than a systematic review or meta-analysis. Narrative review literature has a more flexible structure. The search for the source of article was carried out using Google Scholar, Pubmed, and Elsevier using the key terms: “education” “requirement”, “nutrition status”, “nutrition”, and “athletes”. The article criteria used in this review are article whose research subject are athletes.

3. Result and Discussion

3.1 Nutrition Education

Nutrition education programs are designed to increase nutritional knowledge with the goal of supporting healthy eating patterns in a community or population^{6,7,8,9}. Knowledge is the result of a person's sensing of a particular object. Nutrition knowledge is influenced by various information seen and heard from various existing media. Besides increasing nutritional knowledge in certain individuals or communities, nutrition education also aims to improve balanced nutrition practices in the long term. This educational program is expected to be an alternative in changing mindsets or attitudes in applying balanced nutrition in daily life. The results showed that a nutritional education program in a short period of time could significantly increase the athlete's knowledge regarding supplementation¹⁰. Nutrition education for athletes aims to maintain and improve the athlete's performance. Many factors can affect the type of food consumed including taste, cost, convenience, and knowledge factors¹¹.

Selection of foods an athlete's is more influenced by factors such as time, financial condition, food safety and the frequency of travel during competitions^{12,13}. Athletes usually need knowledge and skills in choosing food. However, research shows athletes still have a poor diet and low nutritional knowledge^{14,15,16}. Information related to nutrition obtained by athletes comes from family, friends, teammates, and the internet¹⁷. Lack of access for athletes to receive nutritional assistance or nutrition education from nutritionists or dietitians who act as sources of appropriate nutritional information, including current diets and consumption of supplements that can improve athlete performance.

In this nutrition education, the role of nutritionists is very important. This is because nutritionists are trusted as people who are in charge of nutrition-related theory. However, nutritionists who are involved in coaching or sports activities are rare. The presence of nutritionists who can be involved in sports activities this achievement will help increase knowledge related to nutrition, ensure information so as not to miss leading, and help arrange the daily menu, and monitor the nutritional status of the athlete. Program menu purpose to adjust the nutritional content needed by athletes, so that the nutritional status of athletes can be monitored and help weight management for athletes. These things can be delivered through the provision of nutrition education theory.

Materials that can be provided during nutrition education activities can come from the Nutrition Smart Book for Athletes published by the Ministry of Health of the Republic of Indonesia. In the book, the reference is conveyed by the Sport Nutrition Pyramid. The main

focus of this pyramid is a balanced nutrition diet, followed by sports nutrition assistance and then the use of supplements if needed. This pyramid has been scientifically proven to improve athlete performance and has been used by experts and sports nutritionists.

These material can be developed into several topics that can be delivered during nutrition education activities. These topics can be delivered face-to-face or online for 30 minutes. Before the material is given, it is better to do a pretest first, the purpose of this pretest is that the increase in nutritional knowledge of athletes can be measured. Posttest will be conducted at the end of the activity. Topics that can be given during nutrition education are hydration, pre-exercise fueling, during exercise fueling, recovery nutrition, body composition, maintaining muscle and staying well, and eating well while eating out ¹⁸.

3.2 Nutritional Status Athletes

The development of sports achievements is one of the annual agendas that uses quite large government funds both at the national and regional levels. Various sciences support achievement, including psychology, anatomy, physiology, education, sports health, nutrition and others. Specifically regarding nutrition, providing the right food intake both in quality and quantity can produce optimal physical conditions and provide sufficient energy for athletes during their activities. However, there are still frequent errors in the management of athletes' nutrition which is one of the weaknesses of sports development in the regions. Very few areas have nutritionists who can provide dietary guidelines to support athlete performance both before the match, during the match and after the match. Based on research conducted¹³ found that athletes often do not pay attention to the recommended level of nutritional needs so that their performance is not optimal. Therefore, it is necessary to regulate nutrition for athletes and provide education about nutrition for athletes.

3.3 Nutritional Requirement Athletes

Energy expenditures (EE) are continuous activities designed to maintain various processes and functions in our bodies. Meanwhile, human energy intake (EI) is limited to their food and drink, where daily energy needs adjust to energy expenditure over a 24-hour period ²⁰. Ideally, energy intake corresponds to energy requirements ⁹. This is the amount of nutritional energy that can ensure a stable weight, as well as promote health and fitness. However, energy demand is not a fixed quantity, but is influenced by many factors including gender, age, body composition, physical activity, and certain physiological conditions ^{21,22}

Calculation of energy needs in a day and night is known as TEE (Total Energy Expenditure). TEE consists of the energy costs of processes essential to life (basal metabolic rate (BMR), i.e. 60–80% TEE), of the energy expended on digesting, absorbing, and transforming food (dietary induced thermogenesis, ~10%), and energy expended during physical activity (activity energy expenditure, ~15-30%)^{20,22}. The older a person is, the lower the TEE will be. This is due to the combination of reduced BMR, reduced physical activity, and reduced likelihood of TEE.

Anabolic conditions occur in power sports caused by strength training through stimulation of muscle protein synthesis (MPS)²³. When MPS exceeds muscle protein breakdown (MPB), the net protein balance (NPB) becomes positive and muscle mass increases. Repeated explosive movements of strength training concurrently with feeding result in a periodic increase in protein accretion above that induced by feeding resulting in muscle hypertrophy²⁴. It is important to consume protein after exercise to maximize exercise-induced MPS-enhancing capacity. During this time, exercise and nutrition interact synergistically to promote greater

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5. Conclusions

The involvement of nutritionists in the sports world in Indonesia is still low. The existence of nutrition education is carried out to parties related to sports activities, especially in sports achievements, can increase knowledge, attitudes, and behavior towards the fulfillment of athlete nutrition. Increased knowledge, attitudes, and behavior can apply consumption patterns that can meet nutritional needs as an athlete and for coaches, officials, and administrators can provide encouragement as a peer group in implementing balanced nutrition patterns in athletes' daily lives. Changes in consumption patterns, especially in adolescent athletes, can become habits that are applied in the long term. Multi-sectoral support and cooperation is needed to bring about this change. Therefore, the provision of sports nutrition education is considered very important to advance the world of Indonesian sports.

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