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EFFECTIVENESS OF NUTRITION EDUCATION TO REDUCE THE RISK OF SPORTS INJURY IN YOUNG SOCCER ATHLETES

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ABSTRACT

Physical exercise is the main factor in improving the performance of athletes. Physical exercise may cause fatigue and increase the risk of injury. Most athletes have experienced injuries during training or competing, such as muscle pain, sprains, muscle tension, bruises, and minor injuries. The majority of athletes lack knowledge regarding the management of injuries through appropriate nutritional interventions. The importance of proper nutrition therapy education as one of the solutions to reduce the risk of sports injury. The purpose of this study was to observe the change in knowledge about proper nutritional therapy in dealing with injuries in young soccer athletes at PSS Sleman Development Center. The study was conducted in July 2022. The provision of education was given at the Macanan Field, Prambanan, Yogyakarta. The respondents were 22 U-16 athletes at PSS Sleman Development Center. Athletes were given a knowledge questionnaire before and after the provision of education. Data were analyzed using statistical software with descriptive analysis and Wilcoxon Signed Rank Test. The increase in athletes' knowledge was measured from the knowledge score before giving education, which was 86,36 and after being given education increased to 89,09 with an average difference of 2,73 (p=0,366). The maximum score after providing education is 100 with a minimum score of 60. Providing education to athletes can increase athlete's knowledge and understanding of the importance of proper nutritional intake in reducing the risk of sports injury.

Keywords: *nutrition education, soccer athletes, sport injuries*

ABSTRAK

Latihan fisik merupakan faktor utama dalam meningkatkan prestasi atlet. Latihan fisik dapat menyebabkan kelelahan dan meningkatkan risiko cedera. Sebagian besar atlet pernah mengalami cedera saat latihan atau bertanding, seperti nyeri otot, keseleo, ketegangan otot, memar, dan cedera ringan. Mayoritas atlet kurang memiliki pengetahuan tentang penanganan cedera melalui intervensi nutrisi yang tepat. Pentingnya edukasi terapi nutrisi yang tepat sebagai salah satu solusi untuk mengurangi resiko cedera olahraga. Tujuan dari penelitian ini adalah untuk mengetahui perubahan pengetahuan tentang terapi nutrisi yang tepat dalam mengatasi cedera pada atlet sepak bola muda di PSS Sleman Development Center. Kajian dilakukan pada Juli 2022. Pemberian pendidikan diberikan di Lapangan Macanan, Prambanan, Yogyakarta. Responden adalah 22 atlet U-16 di PSS Sleman Development Center. Atlet diberikan angket pengetahuan sebelum dan sesudah pemberian pendidikan. Data dianalisis menggunakan software statistik dengan analisis deskriptif dan Wilcoxon Signed Rank Test. Peningkatan pengetahuan atlet diukur dari skor pengetahuan sebelum diberikan penyuluhan yaitu 86,36 dan sesudah diberikan penyuluhan meningkat menjadi 89,09 dengan selisih rata-rata 2,73 (p=0,366). Skor maksimal setelah memberikan edukasi adalah 100 dengan skor minimal 60. Pemberian edukasi kepada atlet dapat meningkatkan pengetahuan dan pemahaman atlet akan pentingnya asupan nutrisi yang tepat dalam mengurangi risiko cedera olahraga.

Kata kunci: atlit sepakbola, cedera, edukasi gizi

INTRODUCTION

The achievements of national soccer athletes are still a concern that needs to be improved. Indonesian national team still has not qualified for the AFF Cup in 2014 and 2022 and also other competitions (Nurikhsani, 2022). A High number of cases of injury on the national team is one of the factors that affect the performance of athletes. Many Indonesian soccer athletes have an unconscious Anterior Cruciate Ligament (ACL)

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disorder. Players who have problems with ACL will get sicker and decrease in performance during the match (Fajriyah, 2016). Severe cases of injury were experienced several times by the Indonesian national team during the 2004 AFF Cup, the 2007 Asian Cup, the 2018 PSSI Anniversary Cup, and the 2019 FIFA. This condition makes it take a long time for players to recover to return to play on the field (Adiyaksa, 2019).

Physical exercise is performed to improve the physical abilities and performance of athletes. It can also have a negative effect, namely, the risk of injury causing pain, bruising, and swelling, if not done appropriately, measurably, and systematically. Injuries can be influenced by several factors, namely physical condition, improper movement, unbalanced muscles, lack of heating, physical contact, environment, and fatigue. Athletes with strenuous physical exercise and long duration have an impact on dehydration conditions and decreased blood glucose, resulting in fatigue and increasing the risk of injury (Setiawan, 2011; Murray, 2007).

Optimal nutritional intake strongly supports performance improvement by delaying the occurrence of fatigue and lowering the risk of sports injury. Improper nutritional intake is one of the triggers for the occurrence of a larger injury condition. The nutritional needs of an athlete are influenced by age, weight, gender, physical activity, and sports activity. The fulfillment of appropriate nutritional intake based on the amount, type, and schedule strongly supports the optimal performance of athletes. Despite this, there are still many athletes with an improper intake of food and fluids. There are still many athletes who have never received education about the increase in appropriate nutritional intake in supporting the success of athletes when competing (Zahra and Muhlisin, 2020; Kementerian Kesehatan RI, 2013). Athletes' knowledge of sports injuries is very important so that athletes can easily, quickly, and precisely perform first aid both self-inflicted and through the help of others (Rosintan & Napitupulu, 2021; Mubarok, Afif Julianto, & Dai, 2021).

PSS Sleman Development Center is one of the soccer clubs in Yogyakarta that is included in the national league. Food intake in PSS Sleman Development Center athletes has not been included in the good category. The nutritional intake of athletes is still below the daily needs of athletes. Athletes consume daily energy of 1,802.11 kcal, protein 60.5 grams, fat 67.3 grams, and carbohydrates 265.5 grams. The daily intake of this athlete was only met by 200 kcal above the basal energy requirement of 1598.22 kcal (Puspaningtyas et al., 2021). The results of another study explained that the selection of the type of fluid and the amount of fluid consumed by athletes was not by following the needs and periodization of exercise. 96% of athletes consume fewer fluids than requirements (Afriani et al., 2022).

A preliminary study on ten athletes at the PSS Development Center found that 70% of athletes had experienced injuries during training and competition. Injuries that often occur are bruises, sprains, and abrasions. Most athletes also do not know the proper handling of injuries. (Puspaningtyas et al., 2021).

The selection of the right nutritional intake can reduce the incidence of injury and accelerate the recovery process and optimal performance in athletes (Mahastuti et al., 2018). Efforts to provide education to football schools have proven to be able to improve athletes' knowledge about the principles of balanced nutrition (Puspaningtyas et al., 2019; Sari et al., 2018). Efforts to increase knowledge about nutrition therapy in handling injuries in football athletes PSS Sleman Development Center need to be carried out as a solution to athletes' independence in dealing with injury problems during training or competing.

METHODS

This research was quasi-experimental with a pre-post design. This research was conducted in July-August 2022. The respondents of this study were 22 U-16 athletes selected using the purposive sampling method. Research Education was conducted at the PSS Sleman Development Center Office, namely Macanan Field, Prambanan, Yogyakarta.

Nutrition education is carried out through lecture and discussion methods with athletes for one day. Education is done once for 100 minutes. The educational material is "The Role of Nutrition

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in Handling Athlete Injuries". This material is based on the results of preliminary studies, namely the high cases of injuries not realized by athletes developed by the researcher. In addition, many athletes do not understand the importance of nutrition in dealing with injuries. This education contains the importance of nutrition to prevent injuries, and the selection of correct foodstuffs to overcome injuries before, during, and after training and competing.

Athletes fill out a knowledge questionnaire before and after providing education. The research data were analyzed with statistical software through descriptive analysis. The data were displayed showing median (min-max). Changes in knowledge scores after education were analyzed using the Wilcoxon Signed Rank test because the data was not distributed normally.

RESULTS AND DISCUSSIONS

Providing education for athletes can increase athletes' knowledge and understanding of proper nutrition and injury management in athletes. Education is a communication method for a group of people that can provide positive changes in knowledge, attitudes, and behavior. Several studies explain that direct and online nutrition education can effectively increase athletes' knowledge scores in implementing balanced nutrition (Waryana and Wijanarka, 2013; Puspaningtyas et al., 2019; Puspaningtyas et al., 2021).

Table 1. The Effect of Nutrition Education on Knowledge Score of Young Soccer Athletes

Description	Pre test Median (Min-Max)	Post test Median (Min-Max)	*P value*
Knowledge Score	90 (40-100)	100 (60-100)	0,366*

**Wilcoxon Signed Rank Test*

Table 1. shows that nutrition education can increase knowledge scores in adolescent athletes by 2.73 points. However, statistically, the increase in knowledge has not changed significantly. Many athletes still think that nutrition is not yet important in injury prevention. They do not know the types of nutrients such as carbohydrates, proteins, fats, vitamins and minerals and their importance in preventing injuries. This is in line with previous research that providing online education on the prevention and management of sports injuries in the field of nursing can increase athletes' knowledge and understanding of sports injury management, but not significantly increased (Sucipto et al., 2022).

Educational materials, well media are needed to increase the acceptance of information (Notoatmojo, 2010). Education or mentoring to athletes can increase their knowledge and understanding of athletes. Increased knowledge can be applied to choose foods and drinks that suit the needs and periodization of exercise so that nutritional status and hydration status become normal and reduce the risk of injury (Brand, 2018). The comparison of pre-post test scores of athletes is displayed in Figure 1.

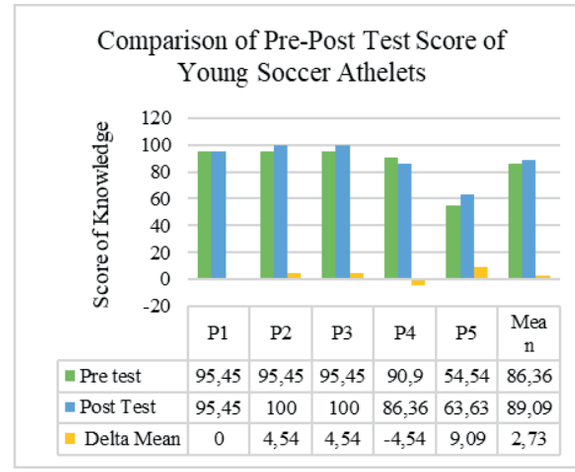

Figure 1. Comparison of Pre-Post Score of Young Soccer Athletes

Based on Figure 1. it is known that question 1 about "Free radicals can cause inflammation" is already very well understood by athletes, only one athlete who answers incorrectly. Free radicals are one of the factors that aggravate the condition of the injury. Physical exercise in the field will produce free radicals followed by a decrease in antioxidant enzymes. The intensity and type of exercise affect the level of oxidative stress. Athletes need food intake or sources rich in antioxidants in helping to ward off free radicals in athletes to lower the rate of inflammation (D' Angelo and Rosa, 2020; Koivisto et al., 2019; Dzuvo et al., 2014)

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The second question is "The consumption of burnt food can lower the risk of injury". On this question is a negative statement that should be the answer is false. The post-test score has increased, which is 100% of athletes answered correctly after providing education. The prevalence of consumption of burned food based on Riskesdas (2018) is 30.6% 1-6 times a week with a contribution to the adolescent age range (15-19 years) of 38.3% of the total population.

Food processed by burning with charcoal contains polycyclic aromatic hydrocarbons that have an impact on increasing inflammation in the body (Sjamsuhidajat, Karnadihardja & Rudiman, 2010). Not all foods that contain fat will trigger inflammation in the body. Animal foods including red meat and egg have a positive effect on the body can potential for pro-inflammation may be suppressed by combining food intake that is high in fiber (Grosso et al., 2022).

The third question is "Whether vitamin C is one type of antioxidant that accelerates recovery". After providing education, 100% of athletes answer with the correct answers. Vitamin C is one type of vitamin that functions as an antioxidant. Antioxidants have an important role in reducing the rate of inflammation in the body. Vitamin C is a cofactor that is very important in metabolic processes in the body and helps the synthesis of hormones (Dosedˇel et al., 2021).

Vitamin C consumed around 0.2 - 1 gr/day can reduce oxidative stress in athletes. Consumption of vitamin C over the recommendations can reduce mitochondrial biogenesis and alter vascular function. It is supported by the results of research that states that athletes' antioxidant needs should be from natural sources, namely food sources of vitamins and minerals, namely vegetables and fruits that have a high content of antioxidants and bioactive substances (Braakhuis, 2012; Higgins et al., 2020).

The fourth question is "Lack of fluid does not aggravate the condition of the injury." In this fourth question, there is a decrease in the score, one athlete answered correctly during the pretest, and in the posttest, the answers to questions were incorrect. It is due to many factors. One of the reasons is the use of educational media. According to several studies, attractive and effective educational media are needed to support successful education by increasing knowledge scores significantly (Kapti, 2016; Putriana & Dieny, 2014; Susanti et al., 2018). It is one that needs to be improved in the educational process to be more accepted by adolescent athletes.

Fluids play an important role in improving the balance of fluids and electrolytes in the body. The body that lacks fluids, will easily experience an increase in core body temperature which has an impact on heat stroke conditions (McCartney et al., 2017). This condition makes it very easy for athletes to suffer injuries during training or competing. Fluid volume and fluid intake selection are also important for the body to be optimally hydrated (Murray, 2007; Meyer, 2016). Another study mentioned that consuming drinks with carbohydrates and electrolytes can improve performance and prevent the occurrence of injuries (O'Reilly & Wong, 2013). Consumption of maltodextrin-based drinks and vitamin C can also improve mood, reduce the risk of injury, and optimal athlete performance (Afriani, Hadjam & Farmawati, 2017).

The fifth question is "A low-glycemic diet can delay muscle fatigue". Most athletes still do not understand the concept of a low-glycemic diet, as seen fair low pretest score, after providing education, the knowledge score of these related athletes has increased, although not 100% of athletes can understand this concept. Foods with a low glycemic index are foods with IG content (≥ 55) with food ingredients such as brown rice, seeds, beans, pasta, sweet potatoes, corn, full cream and skim milk, vegetables, and fruits (Kuswari & Gifari, 2020). A low-glycemic diet can increase athlete endurance compared to athletes who consume foods high in the glycemic index before exercise. Athletes' lactic acid levels have a higher tendency in athletes with a high glycemic index diet (Pambudi & Fauzi, 2019).

Injuries to athletes must be treated immediately so that the condition does not get worse and affects the athlete's performance. Decreased performance in athletes will result in a decrease in achievement, especially in group athletes (Mubarok, Afif Julianto and Dai, 2021). Nutrition education with appropriate media necessary for athletes provided by a nutritionist

(Susanti et al., 2018; Kementerian Kesehatan RI, 2021). Therefore, education using attractive and effective educational media for athletes is needed to increase their knowledge and understanding of appropriate nutritional support. It is very important in preventing, helping to repair, and recover the condition of injuries to athletes so that athletes' performance increases and achievements when competing.

CONCLUSION

Providing education to athletes can increase athlete's knowledge and understanding of the importance of proper nutritional intake in reducing the risk of sports injury. There was an increase in the average score of sports injury prevention and management knowledge by 2.73 points before and after education. It is necessary to modify the use of educational media to increase the knowledge of athletes.

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