

Fulfillment of Nutrition Intake of Volleyball Athletes to Achieve Achievement: A Systematic Review



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ABSTRACT: Sport is a genuine work pointed toward working on accomplishing the main introductions for individuals who are individuals or gatherings. He is trusted to acquire knowledge and innovation that is put to good use in order to achieve success in the field of sports in which he participates. Using a review and analysis of online references on the effects of sports nutrition on athlete performance, the purpose of this writing is to describe how sports nutrition helps athletes achieve their goals. The analysis's findings demonstrate that sports nutrition plays a crucial role in achieving a goal. Where this includes having a significant impact on and determining the rise in an athlete's accomplishments, particularly in volleyball. Using appropriate and expert sports equipment is one of the factors that must be taken into account when determining high volleyball sporting accomplishments because of the application of knowledge and innovation. Starch, fat, protein, nutrients, minerals, water, and fiber are all healthy nutrients for volleyball athletes to consume. Athletes in volleyball are fed well-balanced meals throughout the match, recovery, and preparation phases.

KEYWORDS: Fulfillment, sport nutrition, volleyball, athletes, performance

I. INTRODUCTION

Sport is an active job that requires high energy and can be equated with the energy or calorie requirements of competitors who are very weighty. Normally exercise is done in a long time, with very focused energy, development is sensitive and occurs consistently. The game of volleyball, for example, requires skills related to body health, especially muscle strength and flexibility, speed and agility. Dangerous muscle strength is the ability of the muscles to contract rapidly which is greatly influenced by muscle strength. Thus, in the sport of volleyball one must pay attention to several elements that are mutually sustainable both in terms of physics, tactics and nutrition. Seeing developments that continue to improve, of course, also pay attention in terms of coaching where this is the basis for achieving an achievement in volleyball itself.

Volleyball is one of the group activities that is quite loved by both country and city networks in Indonesia because volleyball is one of the tomfoolery sports and deserves to be used as a game. entertainment and achievement, and can also be used for further health development, before playing volleyball players must know the basic methods and how to master them (Sesbreno et al., 2021). Volleyball itself expects its players to have the choice to master several ways perfectly, such as techniques miss and down, set up (pass), crush, serve and block. for development to occur (Chauhan et al., 2022).

By exercising we can increase muscle mass and endurance, muscle endurance is the ability of skeletal muscles or muscle groups to continue compression during stretches or long periods of time and can recover quickly after fatigue occurs (Nasuka et al., 2020). Muscles can work well if it is balanced with protein intake, if it is not balanced with sufficient protein consumption then the body will lose mass. Athletes who have good muscle endurance can complete sports training for a long time and for a long time. accelerate muscle recovery from fatigue after exercise. The ability of bulk in volleyball games is to reduce joint injuries in participants during preparation, the more bulk in the body, the better the participants' muscle endurance (Gouttebarga et al., 2017). With that, there is still a lot of lack of attention related to nutritional needs that almost every sport does not pay much attention to, because this is one of the determining factors in achieving an athlete's achievement that really also needs to be considered.

II. METHOD

The arrangement of this article was done by investigation utilizing the technique for writing and smaller than expected survey.

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The references used in the study were related to sports nutrition, specifically the role that nutrition plays in supporting volleyball athletes' accomplishments. Additionally, an examination of the overall effect on athletes' nutritional supply was carried out. The inclusion and execution criteria for this study's primary literature sources must be met. The inclusion criteria are based on research on athletes' nutritional knowledge, particularly volleyball athletes. The rejection models utilized were references acquired from research results and supporting articles distributed on the web.

III. RESULT AND DISCUSSION

Factors Affecting Athlete Performance

Physical, mental, and dietary factors can have an impact on an athlete's performance. Strength, functional movement, and pacing strategies make up the physical aspect (Bustamante & Mortejo, 2023). Stress, anxiety, tightness, and aggressiveness, on the other hand, are psychological factors that influence athlete performance. Emotional or mental stress tends to upset the body's homeostasis. There are positive and negative effects of stress on performance, with the positive effect resulting in higher performance and the negative effect resulting in lower performance, which reduces productivity and enthusiasm to respond to stress. Anxiety is a troubling mental state and a necessary component of any competition. A high level of anxiety can make it hard to focus and make it hard to control your mind and body. An emotional response, such as rage or fear, is an example of tension a state in which the mind and body are working against each other. Athletes also perform best or near their best when they are under pressure and motivated. According to Liew et al., (2023), aggression is a robust, hostile, or attacking behavior. Athlete performance can also be affected by talent, effort, and genetics (Miguel-ortega, 2023).

Food's nutritional value has a significant impact on athletes' health and performance, particularly volleyball players. Jumping can use up energy reserves, leading to fatigue and decreased performance in high-intensity sports that require strength and agility. Athletes require additional nutrition to maintain optimal growth and development (Noronha et al., 2020). Fu et al., (2023), optimal sports performance requires proper nutrition. As a meal plan, nutrition is important because it can help you perform better and consume more macro, micro, and fluid nutrients. As indicated by Kwon et al., (2023), volleyball athletes must pay close attention to their nutrition on match days, during training, body composition, stressful environments, cultural diversity, and dietary considerations, as well as food supplements.

The substance of supplements in food, for example, starches, proteins, fats, fiber, liquids and micronutrients is a significant wholesome necessity for competitors in keeping up with wellbeing, expanding endurance during preparing and rivalry. Dietary macronutrients like carbohydrates, proteins, fats, and dietary fiber are important for providing metabolic substrates the energy needed for skeletal muscle contraction and cardiovascular activity. Additionally, the metabolism of volleyball athletes is greatly influenced by glycogen reserves in the liver and skeletal muscles (Miguel-ortega, 2023). Hence, the significance of being familiar with nourishment in competitors is a significant consider affecting competitor execution.

Volleyball

Volleyball is an intermittent sport, consisting of low-intensity stages followed by short, high-intensity exercises (Mandal et al., 2015). (Mandal et al., 2015) In a volleyball game, physical quality, technique, tactics and psychic or mental maturity are aspects that need to be prepared thoroughly, because this is an aspect that will determine other aspects (Asnaldi, 2020). Volleyball is one of the sports that does not directly contact the body (no body contact), because it is limited by the net or net which directly becomes a challenge for players to pass the ball to the opponent's area without touching the net or net. The quality of players will increase, if those elements also increase. These elements have a reciprocal relationship and are a unity that cannot be separated from each other. Technically, volleyball games tend to be complex, because there are various movements that are combined simultaneously from upper, upper or lower body movements (Rifki & Ariston, 2021). The development of the game of volleyball is very rapid along with the development of sports so that volleyball is not only for recreation and filling spare time but develops as a profession and demands high achievement. The development and coaching of volleyball sports requires a scientific approach in choosing training materials, coaching methods and other factors that can support the achievement of the best performance in volleyball (Milistetd et al., 2013).

Nutritional Needs in Athletes

Macro Nutrients (Macronutrients)

1. Sugars

Sugars are a significant macronutrient for volleyball preparing and execution. Although carbohydrate storage is very limited, they are an essential fuel or source of energy for activities that are high-intensity and last a long time. At the point when carb capacity is deficient as indicated by the player's energy needs, the player will encounter weakness. Athletes' performance can be negatively impacted by fatigue by reducing skeletal muscle contraction or central locomotion, which can occur in the central

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nervous system or in the skeletal muscles (peripheral fatigue). The maximum amount of carbohydrates that a person can consume is approximately 600 g per day, or 8 to 12 g/kg; in excess of this amount, carbohydrates do not significantly affect muscle glycogen storage or performance (Steffl et al., 2019). Two to three days before a competition, it is recommended to consume a meal high in carbohydrates to boost performance during prolonged intermittent training and maximize glycogen stores in the liver and muscles. Additionally, adequate carbohydrate intake following exercise can enhance the quality of training by maximizing muscle glycogen storage recovery (Bell et al., 2023).

2. Proteins

Protein is a macronutrient whose job is to increment positive nitrogen balance in dynamic muscles and give more compelling preparation transformations. Protein deficiency can result in decreased muscle mass, which is critical to volleyball athletes' performance. By increasing the rate of muscle protein synthesis, protein intake can accelerate protein turnover in skeletal muscle, giving the muscles strength, improving high-speed running performance, and speeding up protein recovery and lipid peroxidation. Additional protein, such as hydrolyzed gelatin or collagen, is necessary for injury recovery. Therefore, optimal recovery following a strenuous match or training session requires protein, a macronutrient. Whey protein, which, when combined with carbohydrates, can improve performance during intermittent training, is recommended at a daily intake of 3 to 4 grams (Bell et al., 2023).

3. Fat

Although it is not the primary source of energy, fat is an essential nutrient that helps the body perform a number of functions, including providing heat, cushioning vital organs, and providing energy. Despite the fact that fat is not the primary source of energy, it is still required for low-intensity aerobic exercise, recovery from high-intensity exercise, and competition. A fat intake of less than 30% of total calories burned daily (TDEE) is recommended, with saturated fat accounting for 7%, polyunsaturated fat for 10%, and monounsaturated fat for 22.13%. seafood like salmon and mackerel, which are rich in omega-3 fatty acids. Additionally, sardines may help alleviate muscle soreness and post-exercise inflammation. Therefore, it may be a useful addition to a player's diet, but meeting their protein and carbohydrate requirements is preferable (Bell et al., 2023).

Micro Nutrients (Micronutrients)

The need for micronutrients is very important for volleyball players, because during exercise a lot hinders digestion so it requires micronutrients. In addition, the preparation produces expanded biochemical transformations that require some micronutrients. The mini substances that soccer players need and need are iron, vitamin D and cell boosters. B nutrients such as B1, B2, niacin, B6, B12, biotin, folic acid and pantothenic acid have a significant ability in the digestion of energy that is usually consumed by soccer players to increase energy needs (Oliveira et al., 2017).

Iron (Fe)

Iron deficiency can lead to weakening of muscle abilities and peak work limits leading to transformations of preparation and athletic performance. Iron is an important micronutrient for soccer players because of its dependence on digestion that consumes oxygen. Based on the study, players who had serum ferritin content below 30µg/L and typical ferritin with transferrin immersion below 20% experienced weakness and less recovery time during serious periods. A good iron intake for soccer players, especially those at risk of deficiency, is an iron intake equivalent to or higher than the RDA (Recommended Dietary Remittance), which is >8 mg/day for men. Taking iron supplements after strenuous activity can cause an increase in hepcidin levels that interfere with iron retention, so it is not recommended to take iron supplements after exhausting activities (Oliveira et al., 2017).

Vitamin D

Vitamin D serves to regulate the absorption of calcium, phosphorus and digestion which plays an important role in maintaining bone health. In addition, vitamin D plays an important role for non-skeletal functions such as skeletal muscle growth, endurance, aggravation balance, and athlete performance. Volleyball players who have low vitamin D levels, precisely <30ng/mL or <75 nmol/L are at risk of external muscle injury and stress breaks as well as decreased muscle strength. Vitamin D can be tracked during the day and food. Some types of foods that contain vitamin D are oily fish, egg yolks, and fortifying food sources (milk, yogurt, ready-to-eat oats) which are widely consumed through dietary fat. The Recommended Food Recompenses (RDA) for vitamin D in each country is unique, in Australia and New Zealand it is 200 IU, in the US and Canada it is 600 IU. Meanwhile, the RDA of vitamin D according to the RDA in Indonesia is 15 mcg for people aged 10-64 years (RDA, 2019). Suggested blood levels of vitamin D from 30-32 ng/mL and up to 40-50 ng/mL are great for ideal preparatory and conscription transformations (Oliveira et al., 2017).

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Cell strengthening

Cell strengthening also plays an important role in fighting ROS, preventing or reducing muscle sensitivity, further improving perseverance performance and delaying fatigue. Although cancer prevention agents play an important role in exercise, additional enhancement is not recommended as some experts disagree with the presence of additional cell strengthening supplements. Some arguments rely on how exercise increases enzymatic and non-enzymatic cancer prevention agents in muscle fibers, perhaps cell strengthening supplementation inactivates or delays muscle function by interfering with marking function in ROS cells and increasing muscle damage and oxidative stress. Competitors are encouraged to focus on a fair and moderately active diet that provides a variety of nutrient-rich foods (Oliveira et al., 2017).

Fluids and Electrolytes

During competition, when the internal temperature of the body increases, obviously the main component plays an important role in increasing heat loss by activating the sweat organ. Fluid loss through sweat makes volleyball players dry during the game. Hydration is something that is often overlooked but is crucial for competition performance. Players should ensure that they are fully hydrated before starting preparations or matches because the possibility of fluid ingress during a game is restricted, and the ability to remove fluid from the stomach can be restricted and compromised. Drying >2% weight loss has been shown to slow down volleyball execution, particularly the skill of jumping and crushing the ball with extreme focus. Physiological variables that contribute to reduced performance of oxygen consumption due to drought are increased levels of heatiness, increased cardiovascular stress, increased glycogen use, adjusted metabolism, and sensory system focusing capabilities. Water intake for adults with moderate activity is 3.2 L/day and for adults with more dynamic active activity is 6 L/day (Oliveira et al., 2017).

Meeting the Nutritional Needs of Athletes based on Training Preiodization Before Training or Match

The purpose of preparation in volleyball is to develop strength and create weak areas, for example, changes in weight and structure (expansion in large quantities, decrease in fat mass) may be required. The energy requirement consumed by young adult participants before preparation is 400 kcal and the best time to eat it is 3-4 hours before starting preparation or match (Mujika et al., 2019). The athlete must start the game on an empty stomach (Durkalec-Michalski et al., 2023). So it's best to focus on consuming high-carbohydrate food sources to provide no less than 1 g/kg of body weight for 3-4 hours before cooking or competition. Fat and fiber are avoided completely to prevent cramps due to delayed abdominal cleansing. The recommended protein before preparation and contests is 10-25%. Meanwhile, moderate protein intake (10-20 grams) before, during, and after training can improve positive protein balance in prepared muscles or improve muscle functional limits (Tagawa et al., 2022).

During Training or Games

Nutrition during training or competition necessarily aims to maintain adequate convergence of blood glucose and muscle glycogen to compensate for higher levels of energy production and delay fatigue as much as possible. The supplement is administered in a fluid structure that can flow through the stomach and into the circulatory system without making it difficult for participants during the game or preparation. This is the perfect opportunity during half-time which is the most obvious opportunity to renew some of the fluids and carbohydrates lost during the game (Wirnitzer et al., 2023). The best and beneficial way is to drink isotonic sports drinks that have a sugar definition of 6-8% or carbohydrate supplementation at 30-60 g/h or by polishing attenuated fruit juices, high-energy bars of carbohydrates, fruit, water. and gel. Isotonic drinks are easy to process, store, help maintain hydration status, provide a substrate to delay fatigue and compensate for expertise, the mental ability to limit performance decline towards the end of a game or training. Isotonic hydration is an important supplement in practice that is drawn out or lasts more than 1 hour due to significant improvements in energy prerequisites (Cameron, 2021).

During Training or Games

Food during training or contests of course aims to maintain adequate concentrations of blood glucose and muscle glycogen to compensate for higher levels of energy production and delay fatigue as much as possible. Supplements are given in the form of a liquid that can flow through the stomach and into the circulatory system without making it difficult for participants during games or preparations (Miguel-ortega, 2023). This is the perfect opportunity during half-time which is the most obvious opportunity to renew some of the fluids and carbohydrates lost during the game. The best and beneficial way is to drink isotonic sports drinks that have a 6-8% starch plan or carbohydrate supplementation at 30-60 g/hour or by polishing attenuated fruit juices, high-energy carbohydrate bars, fruit, water. and gel. Isotonic drinks are easy to process, store, help maintain hydration status, provide a substrate to delay weakness and compensate for expertise, mental ability to limit performance decline towards the end of a game or training. Isotonic hydration is an important supplement in practice that is drawn out or lasts more than 1 hour due to significant improvements in energy prerequisites (Cameron, 2021).

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After Training or Match

Supplements needed especially for athletes after a game or preparation are sugar and protein for muscle glycogen recovery. The motivation behind satisfying nutrition after a workout or match is to rebuild and repair developing tissue. In addition, it replaces glycogen stores in the liver and muscles. A great opportunity to eat foods high in sugar, low in fat and fiber is 3 hours after a game or exercise (Mujika et al., 2019). Meanwhile, food for recovery from 15 minutes to 4 hours after a game or training is a crucial time (Cameron, 2021). The best foods consumed after exercise or exercise are sugars and proteins that can restore normal physiological function effectively, reduce muscle soreness and eliminate the mental side effects associated with excessive fatigue thereby reducing injuries.

IV. CONCLUSION

Athlete performance is influenced in large part by nutrition knowledge. Athletes need to be aware of their nutritional requirements before, during, and after training or competition. Athletes need to consume foods high in carbohydrates before training or competing to boost glycogen reserves in the liver and muscles and improve performance during prolonged intermittent training. Carbohydrates in liquid form are consumed during training and matches, while protein and carbohydrates that are absorbed quickly during recovery are consumed after. The significant macronutrients for competitors are sugars, protein and fat, while the significant micronutrients are iron, vitamin D and cancer prevention agents. Because dehydration hinders performance, hydration is also an essential nutrient for athletes. As a result, athletes need to know a lot about nutrition because it affects their eating habits, which in turn affects their performance.

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