Optimizing Physical Performance and Nutritional Strategies for Young Basketball Players: Training Load Distribution and Recovery Approaches

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Abstract: *Background*: This study examines the optimization of physical load distribution in young basketball players while integrating nutritional strategies to enhance performance, recovery, and overall health. Proper nutrition supports endurance, muscle function, injury prevention, and physiological development in young athletes, making it essential in conjunction with structured training.

Method: This study employs a scoping review methodology to analyze recent literature on the physical performance and nutrition of young basketball players. It synthesizes findings from studies published between 2014 and 2024, focusing on training strategies, nutritional practices, and their impact on the physical development of athletes. The review examines factors such as exercise routines, hydration, macronutrient and micronutrient intake, and post-exercise recovery strategies to optimize performance and ensure long-term health for youth athletes.

Results: The review identifies key factors that influence youth basketball performance, including structured training, proper nutrition, and hydration. It emphasizes the importance of balanced macronutrient intake and targeted interventions to enhance strength, endurance, and recovery, thereby optimizing physical development.

Conclusions: A holistic approach that combines structured training with tailored nutrition plans is essential for enhancing youth basketball performance and promoting long-term health.

Keywords: Sports nutrition, team training, group exercises, development of jumping ability, endurance, Illinois test.

INTRODUCTION

Basketball is one of the most popular team sports globally, with its competitive nature and high-intensity gameplay attracting millions of fans. The sport's growing reputation is reflected in the immense popularity of National Basketball Association (NBA) and Euroleague players, who serve as role models for aspiring athletes. In Albania, basketball holds a strong cultural presence, ranking as the second most popular sport after football. However, despite its mass appeal, the development of basketball in the country faces significant challenges. As of early 2024, Albanian basketball is struggling due to inadequate infrastructure, organizational deficiencies, a lack of financial investment, and the absence of legislative support for sponsorships. These barriers have hindered the progress of young athletes and reduced the quality of player development.

Furthermore, while training loads for basketball players have increased significantly in recent years, there is a pressing need to refine training strategies to optimize physical performance while safeguarding long-term health outcomes [1]. Beyond athletic performance, intensive training in young athletes raises broader concerns about child health and development. The physiological demands of high-level basketball require a careful balance between training loads and nutritional intake to support growth, hormonal stability, and overall well-being. Pediatric sports medicine research highlights that improper training regimens, particularly those lacking appropriate nutritional strategies, can lead to overuse injuries, delayed growth, and metabolic imbalances. Nutritional deficiencies, particularly in macronutrients and essential minerals such as calcium, iron, and vitamin D, may impair bone health, weaken immune function, and disrupt endocrine regulation in adolescent athletes. Additionally, research indicates that young athletes engaged in high-intensity sports without adequate energy intake may be at risk of developing relative energy deficiency in sport (RED-S), a condition associated with decreased bone mineral density, menstrual irregularities, and impaired recovery [2]. These risks underscore the need for an integrated approach that combines evidence-based training methodologies with structured nutritional support.

The interplay between sports science, nutrition, and public health is particularly relevant in the context of preventing childhood obesity and promoting musculoskeletal health. Engaging in regular, structured

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physical activity has been shown to reduce the risk of obesity, improve cardiovascular health, and enhance cognitive function in children and adolescents. However, for basketball training to serve as a sustainable health-promoting intervention, proper dietary intake must accompany physical exertion. Inadequate hydration and poor macronutrient distribution can exacerbate fatigue, impair neuromuscular function, and increase susceptibility to injury. Moreover, improper recovery nutrition can prolong muscle soreness, reducing training efficiency and increasing the likelihood of burnout in young athletes. Given the long-term consequences of suboptimal training and dietary practices, there is a need for more research into how youth basketball programs can integrate sports science with pediatric nutrition to foster both athletic excellence and overall health.

Several studies have explored aspects of training optimization in young basketball players. Spiteri *et al*. [2] and Wang *et al*. [3] investigated the mechanical determinants of agility development in female youth basketball players, highlighting the importance of cognitive and neuromuscular control in directional changes. However, these studies did not address how nutrition impacts agility, muscle recovery, or overall athletic development. Similarly, Csató [4] investigated strategies to enhance motivation through training variation but did not examine how dietary factors contribute to an athlete's ability to sustain high-intensity training over extended periods. Lucia *et al*. [5] highlighted the role of cognitive-motor training in skill acquisition, reinforcing the importance of monitoring physical adaptation, but the study lacked discussion on how macronutrient intake influences an athlete's neuromuscular responses and fatigue management. The intersection of psychological resilience, physical endurance, and nutrition is another critical area requiring further exploration. Koop and Jooste [6] discussed psychological training techniques for young basketball players, focusing on mindfulness and cognitive concentration during games. While their research provides insights into optimizing mental performance, it does not address the dietary components necessary for sustaining focus, preventing cognitive fatigue, and maintaining metabolic efficiency. Similarly, Tănase *et al*. [7] analyzed the effectiveness of specialized training approaches for players under 16, emphasizing tactical and psychological preparation, but did not explore how proper nutrition can enhance an athlete's capacity for learning and physical adaptation.

Given these research gaps, this study aims to analyze the factors that influence the performance of youth basketball players within the context of educational and training processes. It focuses on optimizing physical performance through appropriate load distribution and nutrition, highlighting the importance of maintaining long-term health. By integrating insights from sports science, pediatric medicine, and nutrition, this review seeks to provide a comprehensive understanding of effective training strategies that support both athletic success and overall well-being in young basketball players.

MATERIALS AND METHODS

The materials of this research consisted of literature sources published over the past ten years, selected for their relevance to contemporary methods aimed at improving the physical performance of basketball players aged 16–18, as well as for their coverage of established principles in the organisation of training processes for youth basketball teams (both male and female). The study represents a structured synthesis of current theoretical and methodological developments in the field. These literature sources were published in sports-oriented publications, specifically: Sports, Sports Medicine, Cuadernos de Psicología del Deporte, and Journal of Human Kinetics. The criteria for including literature sources in the review were chosen: the focus of the research topic on solving the problems of physical endurance development in young volleyball players, publication between 2014 and 2024, and the presence of information verified in practice through the training of basketball teams. The key directions of scientific research within the selected topics, the results achieved, and the main problems encountered by researchers during the study of the stated topics are presented. At the same time, the literature review did not include sources describing the training of athletes in individual sports (Figure **1**).

RESULTS

Over the past decade, a significant amount of scientific research has been conducted on the principles of improving physical performance and perception of training loads among basketball players aged 16-18. Most researchers agree that an objective assessment of athletes' ability to perceive changes in physical loads can be obtained by implementing a special testing system into the educational and training process, with the control of this process being carried out by the basketball team's coach. In particular, Gál-

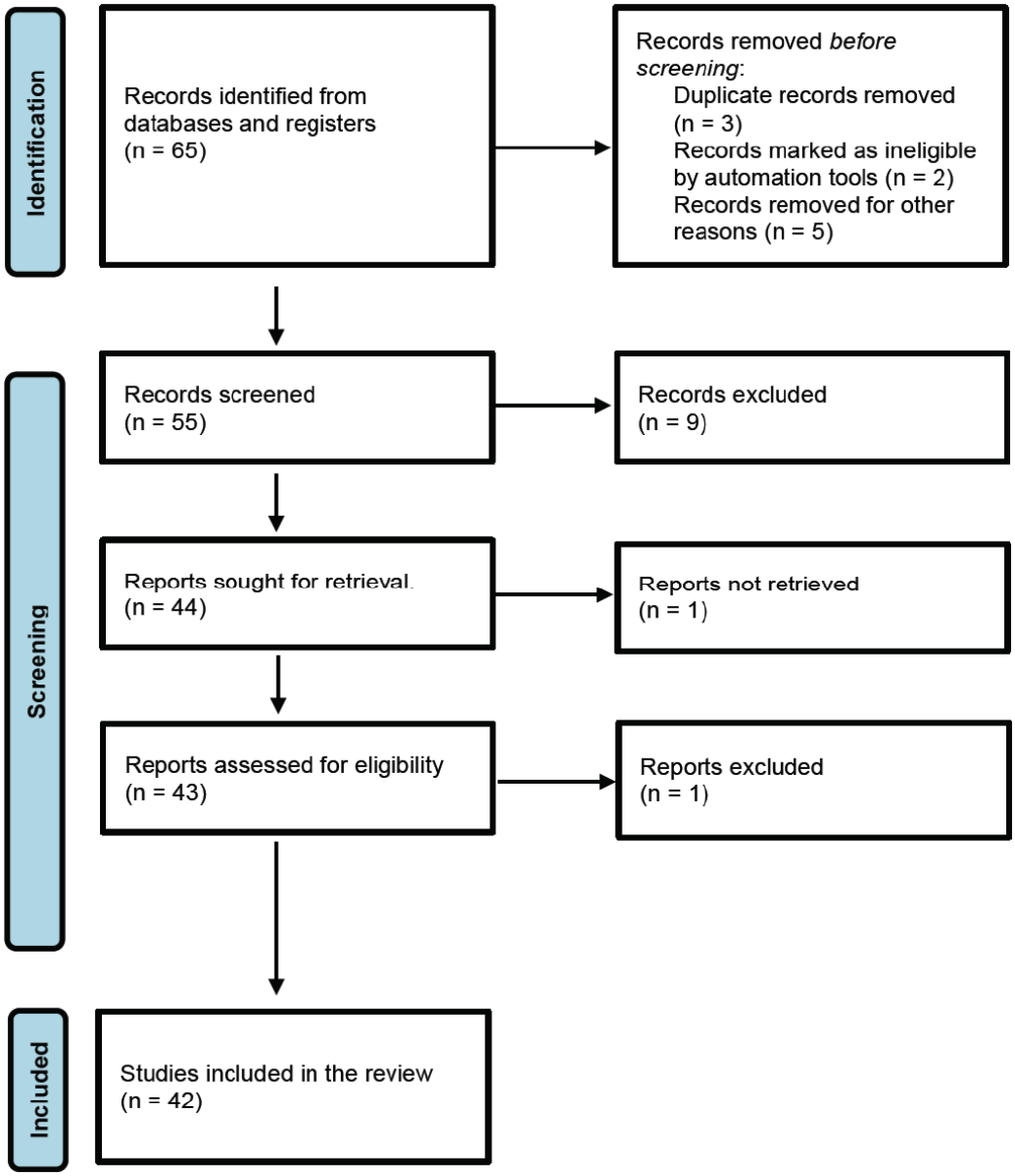

Figure 1: PRISMA 2020 flow diagram for systematic reviews.

Pottyondy *et al*. [8] and Zeng *et al*. [9] examined several problematic aspects of data collection and consultation in basketball field tests. The authors note that the use of tests to determine the actual level of physical performance of basketball team players should be scientifically based, as thorough processing of results using scientific methods allows for objective conclusions, which can then be used in designing athletes' training.

Psychological and physical monitoring of basketball players occupies a special place in the educational and training process. Fox *et al*. [10] examined several problematic aspects of organizing approaches to monitoring the psychophysical state of basketball team players, in the context of using microscopic sensors in modern basketball. According to researchers, assessing the real physical performance of junior basketball team players and their perception of training loads can be achieved by applying the principle of quantitative assessment of various variables, such as physical loads during training sessions and competitive activities. Special attention is deservedly given to research on the use of specific exercises in the educational and training process of basketball teams. In particular, a scientific study by Štrumbelj *et al*. [11] considered several issues related to the assessment of shuttle running effectiveness in various positions among elite women's basketball players. Scientists concluded that coaches and sports physicians should

monitor the development sequence of physical performance in young basketball players at all stages of team preparation to achieve optimal final results. However, issues related to preparing a qualified coaching staff to ensure the objectivity of the conducted assessment were not addressed in the scientific work. Speed endurance is essential for young basketball players to control the game's course and achieve positive results. Figueira *et al*. [12] examined the peculiarities of developing speed endurance in highly trained basketball players. The authors note that modern sports impose high demands on players, the essence of which lies in developing their ability to withstand short-term, high-power, and high-speed loads. Sprinting qualities in a basketball player are developed from childhood and adolescence, of course, provided that athletes have clear aptitudes for development in this direction of sports training.

In contrast to current global trends, the actual situation in Albania regarding the skill level of young basketball players, especially females, is far from optimal. This problem has already been confirmed by a national study conducted by the Institute of Sports, Culture, and Health Sciences (IKSHS) and presented at the National Conference "Young Elite Athletes" (Current Development of Events and Near Future Perspective), as well as by the Study of Physiological Parameters of Young Elite Athletes (Candidates for participation in the Mediterranean Games and Olympic Games 2020), organized by IKSHS. Referring to the data from these mentioned studies, one can objectively assess the basketball situation in Albania at the beginning of 2024. All measured indicators show that the level of elite basketball players largely corresponds to the population level, both in terms of functional assessment and VO2 max. Women's basketball remains at an amateur level, as reflected in the poor performance of national teams over the past 20 years. There is also a serious situation with postural deviations in the first men's national team. The assessment of kyphosis based on measurements shows that 10 out of 15 players have serious problems in this aspect. Likewise, the assessment of lordosis indicates moderate problems within this team. The situation is better when evaluating scoliosis, where only four players show minor deviations.

The systematic introduction of plyometric exercises into the training programme of young basketball players implies the mandatory consideration of several factors: age; current level of physical training; specific technical techniques included in these exercises; key factors determining performance in basketball; energy intensity and energy consumption of basketball; particular athlete stage's training in the context of the prepared plan; systematic increase in the volume of physical loads during the athlete's training. The execution of plyometric exercises requires the athlete to maintain a high level of concentration during the session. Otherwise, if the athlete is not sufficiently disciplined and concentrated on the process of performing the exercises and achieving the planned results, they may not give the expected effect. They may even cause injuries and painful conditions. In this case, these results may not be due to the influence of the exercises themselves; the reason lies in the coach's lack of training and inability to properly monitor the results of a particular type of exercise. Consistent use of exercises of varying intensity levels in the training process will help basketball team coaches develop a training program that involves a gradual increase in physical activity, combined with sufficient rest periods. This will gradually increase the performance of young athletes and their ability to accept training loads.

The most important aspect in improving the physical performance of young basketball players and their ability to cope with sports loads is the development of speed and jumping ability. Speed is one of the key bio-motor components in several sports, including basketball. For this sport, it can be characterized as "a multi-directional ability that seamlessly combines explosive power, reactivity and instantaneous acceleration" [13]. Based on this definition, we can conclude that about the realities of modern basketball (both men's and women's), speed should be considered a component of agility, because during a match the athlete's speed is inextricably linked to his ability to suddenly change the direction of movement on the court, to escape from collisions with the opponent, his tactical maneuvers, to find optimal opportunities to be under the opponent's shield to win a rebound, to complete the game combination. In all game sports, and basketball in particular, it is necessary to take into account and utilize the biomechanical component of speed, which provides grounds to consider it a complex, integrated skill that enables a basketball player to move as quickly as possible during specific game episodes of the match.

The pursuit of improved team performance is a primary goal of basketball training programs, as highlighted in the study by Mateus *et al*. [14]. The authors suggest that optimizing physical activity levels

through specialized endurance training can yield significant improvements in competitive performance. However, endurance cannot be sustained without adequate macronutrient support, particularly carbohydrates for glycogen replenishment and proteins for muscle recovery. Plyometric training, as examined by Roopchand-Martin *et al*. [15], has been widely recognized for its benefits in building strength, agility, and overall coordination. While plyometrics improve explosive power and movement efficiency, they also impose substantial mechanical stress on joints and connective tissues. Without proper dietary support, including anti-inflammatory foods rich in omega-3 fatty acids and polyphenols, athletes may experience prolonged recovery periods and an increased risk of overuse injuries. Despite these known interactions between nutrition and training outcomes, there remains no universally accepted framework for determining how specific dietary modifications should accompany different training loads.

Agility is a critical determinant of basketball performance, influencing an athlete's ability to maneuver quickly and react to dynamic game situations. Scanlan *et al*. [16] and Jakovljevic *et al*. [17] investigated the impact of anthropometric data, strength development, and cognitive factors on reactive agility in basketball players. Their findings suggest that agility training must be highly individualized, taking into account differences in muscle composition, neuromuscular coordination, and overall athletic aptitude. However, these studies do not consider the role of nutrition in optimizing neuromuscular responses and cognitive sharpness. Adequate intake of B vitamins, magnesium, and omega-3 fatty acids has been linked to improved reaction time and mental clarity, yet these elements are rarely integrated into basketball training discussions. Given the complex interplay between nutrition, neuromuscular efficiency, and agility, future research should investigate how dietary interventions can improve movement efficiency and enhance injury resilience in young athletes.

Proper nutrition plays a fundamental role in the overall physical performance and endurance of young basketball players. Given the high-intensity nature of basketball, which involves frequent accelerations, decelerations, jumps, and multi-directional movements, maintaining optimal energy levels through nutrition is critical. The physiological demands placed on young athletes during training and competition necessitate a well-structured dietary plan that supports muscle function, recovery, and long-term development. The effectiveness of training loads largely depends on the nutritional status of the athletes, as an inadequate diet can lead to decreased endurance, slower recovery times, and increased risk of injuries.

The primary macronutrients — carbohydrates, proteins, and fats — serve distinct and complementary roles in an athlete's energy metabolism and overall performance. Carbohydrates are the dominant energy source for high-intensity exercise, as they are quickly metabolized to provide glucose for ATP production [18, 19]. The availability of muscle glycogen is directly correlated with an athlete's ability to sustain repeated explosive movements, such as sprints and jumps, which are fundamental in basketball. A depletion of glycogen stores can result in early onset fatigue, reduced speed, and diminished agility during both training and competitive matches. Therefore, young basketball players should consume sufficient complex carbohydrates from whole grains, fruits, and vegetables to maintain energy reserves throughout their training sessions. Proteins, on the other hand, are essential for muscle repair and adaptation. Given the high levels of muscular exertion involved in basketball, including plyometric exercises and strength training, young athletes require an adequate intake of high-quality proteins to facilitate muscle recovery. Insufficient protein consumption can lead to prolonged muscle soreness and slower adaptation to training loads, ultimately affecting performance consistency [20]. In addition to whole food sources such as lean meats, dairy products, and legumes, post-training protein supplementation has been shown to accelerate muscle protein synthesis, reducing the risk of overtraining-related injuries.

Fats, often overlooked in sports nutrition, play a crucial role in supporting long-term energy needs, particularly during endurance activities. Unlike carbohydrates, which provide immediate energy, fats are metabolized at a slower rate, making them an important fuel source during extended training sessions. Incorporating healthy fats from sources such as nuts, seeds, avocados, and fatty fish can help young basketball players maintain energy balance and support cognitive function during prolonged periods of play.

Hydration is another key factor in ensuring optimal physical performance, particularly in sports like basketball, which involve continuous movement and frequent bursts of maximal effort. Fluid loss through sweat can significantly impair cardiovascular function,

thermoregulation, and muscle efficiency [21]. Studies have demonstrated that even mild dehydration, equivalent to a 2% loss of body weight, can lead to decreased reaction time, reduced endurance capacity, and diminished cognitive function. Given that young athletes may not always recognize early signs of dehydration, coaches and trainers must emphasize proper hydration strategies before, during, and after training sessions. Water alone may not always be sufficient, especially during prolonged exercise where electrolyte depletion becomes a concern. Sodium, potassium, and magnesium play critical roles in muscle contraction, nerve function, and fluid balance. Sports drinks containing electrolytes can be beneficial in preventing cramps and maintaining optimal hydration status, particularly in high-temperature conditions. However, excessive consumption of sugar-laden sports beverages should be avoided, as they can contribute to unnecessary caloric intake and metabolic imbalances. A balanced approach, combining water and electrolyte-rich foods such as bananas, oranges, and leafy greens, can help maintain hydration and support overall recovery.

Just as training loads are periodized to optimize performance, nutritional intake should be adapted according to different phases of the season [22]. During pre-season training, when physical conditioning and strength development are emphasized, energy intake should be slightly increased to support muscle hypertrophy and endurance gains. A focus on lean proteins, complex carbohydrates, and hydration strategies is significant during this phase. During the competitive season, the goal is to maintain peak performance while minimizing fatigue. Carbohydrate intake should be optimized to ensure rapid glycogen replenishment between games, and hydration strategies should be prioritized to prevent performance declines. Post-game recovery meals should emphasize quick-digesting proteins and anti-inflammatory foods to enhance muscle repair. In the off-season, when training intensity is reduced, energy intake should be adjusted accordingly to prevent unnecessary weight gain. This period enables athletes to prioritize overall health and recovery while maintaining a balanced diet that supports metabolic function and immune resilience.

Nutrition is a critical component of an athlete's ability to perform at high levels, sustain endurance, and recover efficiently. For young basketball players, proper dietary strategies that balance macronutrient intake, hydration, and micronutrient sufficiency can significantly enhance training adaptations and overall physical readiness. By integrating well-structured nutrition plans into their training programs, coaches and sports scientists can ensure that young athletes develop not only physically but also holistically, reducing the risk of injuries and optimizing long-term performance. Given the increasing physical demands of modern basketball, nutritional education should be an integral part of an athlete's development, equipping them with the knowledge and habits necessary for sustained success in their sporting careers.

DISCUSSION

The general principles of distributing physical loads when using fitness exercises in planning the physical preparation of young basketball players were discussed in a study by Mancha-Triguero *et al*. [1]. According to the authors, currently, there is a lack of sufficient tests in the arsenal of basketball team coaches that can be effectively used to obtain an objective assessment of the real impact of fitness training on the physical preparation of young basketball players. It is also noted that physical readiness can be considered as a factor of work capacity, which can only be tracked through specially prepared and objectively conducted testing. Researchers on the issues of preparing youth basketball teams agree on the necessity of organizing and implementing regular monitoring techniques for the physical condition of young basketball players at different stages of the training process. However, questions remain unanswered regarding the side effects of physical exertion on the athlete's body in cases of overtraining or chronic fatigue syndrome.

Good jumping ability is an essential quality of a basketball player, which determines their ability to influence the outcome of specific game episodes – to win the rebound and fight under the boards [23, 24]. The development of jumping ability is a key component of the educational and training process, aimed at achieving a higher level of physical performance in young athletes and increasing their overall perception of training loads [25].

The development of physical performance in young basketball players through varied training loads remains a subject of ongoing research and debate. While structured training programs play a key role in enhancing an athlete's strength, endurance, and agility, the impact of nutrition on long-term health and sports performance must be equally emphasized. Ensuring

optimal training adaptation requires a multifaceted approach that integrates both individualized physical conditioning and tailored nutritional strategies to support growth, immune function, and injury prevention. Despite increasing scientific interest in optimizing training regimens, consensus on the most effective combination of training loads remains elusive. The study by Folgado *et al*. [26] highlights the importance of continuously monitoring the physical condition of young basketball players to prevent overtraining and fatigue-related injuries. Given that young athletes are still undergoing physiological development, excessive physical loads without appropriate nutritional support can disrupt normal growth patterns, delay musculoskeletal maturation, and increase the risk of metabolic imbalances. The absence of standardized guidelines for integrating nutritional interventions into training programs further complicates efforts to maximize young athletes' performance and overall well-being. While sports doctors can offer valuable insights, it remains the responsibility of coaches to understand how training loads interact with an athlete's nutritional status and physiological demands [27].

Mancha-Triguero *et al*. [28] discuss the increasing intensity of team sports and the need for a balanced approach that harmonizes physical, technical, and tactical preparation. Female athletes, especially during adolescence, require sufficient intake of calcium, vitamin D, and iron to support bone density and prevent deficiencies that could lead to stress fractures and reduced endurance. However, many existing training regimens do not adequately address the interplay between physical exertion and nutrition, leading to inconsistent performance outcomes. Additionally, Reina *et al*. [29] highlight the scarcity of research dedicated to physical activity planning in women's basketball, making it difficult to establish evidence-based recommendations for training load distribution and recovery. Without precise data on how young female athletes respond to varying training intensities, there is a risk of both undertraining and overexertion, each of which carries distinct health consequences. Comprehensive nutritional assessments alongside regular physical evaluations could provide a more holistic framework for improving physical conditioning while safeguarding long-term health.

Morrison *et al*. [30] investigated the development of test-based systems for assessing the fitness levels of male basketball players, emphasizing the need for periodic evaluations of strength, agility, endurance, and anaerobic capacity [31-33]. While these assessments provide valuable data on an athlete's physical condition, they do not account for the influence of nutritional deficiencies on performance outcomes. For example, iron deficiency, which is common among young athletes, can impair oxygen transport and lead to reduced aerobic capacity, yet such physiological markers are often overlooked in training evaluations. Additionally, insufficient energy intake relative to training demands can contribute to the development of relative energy deficiency in sport (RED-S). This condition negatively affects metabolic rate, hormonal balance, and bone health. Integrating biochemical assessments into fitness evaluations could enhance the ability to detect early signs of nutritional imbalances and adjust dietary strategies accordingly.

Recovery is a crucial component of an athlete's training regimen, and nutrition plays a pivotal role in facilitating muscle repair, replenishing energy stores, and reducing inflammation [34]. The post-exercise meal should be carefully designed to provide the necessary nutrients for optimal recovery. Consuming a combination of carbohydrates and proteins within 30-60 minutes after training has been shown to enhance glycogen resynthesis and promote muscle protein repair. This period, often referred to as the "anabolic window," is a critical time for nutrient absorption, where the body is primed to utilize dietary intake for maximum recovery benefits. For young basketball players, meals rich in high-glycemic carbohydrates, such as rice, pasta, and whole-grain bread, paired with lean protein sources like chicken, fish, or dairy products, can help accelerate recovery and minimize muscle fatigue. Additionally, incorporating anti-inflammatory foods, such as berries, turmeric, and omega-3-rich fish, can help mitigate muscle soreness and promote faster tissue repair. Adequate sleep, combined with proper nutrition, is also essential for recovery, as growth hormone release and muscle repair processes occur predominantly during deep sleep cycles [35].

While macronutrients form the foundation of sports nutrition, micronutrients play a vital role in ensuring the overall health and physiological efficiency of young athletes. Deficiencies in key vitamins and minerals can lead to impaired energy production, weakened immune function, and increased susceptibility to injuries. Iron, for example, is essential for oxygen transport in the blood [36]. Young basketball players, particularly female athletes, are at a higher risk of iron deficiency due to increased physical demands and, in some cases, dietary restrictions. Low iron levels can lead to

fatigue, reduced aerobic capacity, and decreased endurance. Consuming iron-rich foods, such as lean meats, spinach, and legumes, along with vitamin C-rich foods, can help maintain adequate iron levels. Calcium and vitamin D are equally important for maintaining bone health and preventing injuries [37-39]. Given the high-impact nature of basketball, players are at risk of stress fractures and joint injuries if their bone density is compromised. Dairy products, fortified plant-based alternatives, and exposure to sunlight are essential for maintaining bone strength through the synthesis of vitamin D. Magnesium, zinc, and B vitamins also contribute to muscle function, energy metabolism, and neurological coordination, all of which are critical for maintaining peak performance on the court [40, 41]. Ensuring a well-rounded diet with a variety of nutrient-dense foods can help young athletes meet their micronutrient requirements.

CONCLUSIONS

This scoping review identified key factors influencing the development of youth basketball training programs, with a focus on optimizing physical performance and ensuring long-term health. Effective training strategies should include structured exercise routines, standardized testing, and regular performance assessments to enhance both physical conditioning and technical skills in young athletes. Addressing postural abnormalities and targeting the development of strength and endurance are crucial for long-term athletic growth. Proper nutrition plays a crucial role in sustaining optimal performance, supporting muscle recovery, and minimizing injury risks. Ensuring adequate intake of carbohydrates, proteins, healthy fats, and maintaining proper hydration are essential for optimal energy levels during training and competition. Additionally, post-exercise nutrition strategies that focus on protein and carbohydrate consumption promote muscle repair and adaptation. At the same time, micronutrient sufficiency, particularly iron and calcium, is crucial for maintaining endurance and bone health.

Practical recommendations emphasize whole-food-based nutrition plans with lean proteins, complex carbohydrates, and anti-inflammatory fats. Hydration strategies should include regular water intake and the consumption of foods rich in electrolytes to prevent dehydration and a decline in performance. Nutritional assessments should be regularly integrated into training programs to ensure that young athletes meet their dietary needs for optimal physical development and growth.

Future research should focus on integrating nutrition science with athletic training to develop evidence-based guidelines for young athletes. This integration should combine physical conditioning with structured dietary planning to contribute to the long-term success of youth basketball programs.

DECLARATION OF INTERESTS

The authors declare that there is no conflict of interest.

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Data can be accessed by reaching out to the corresponding author.

ETHICAL APPROVAL

Not applicable.

CONSENT

Not applicable.

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