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Nutrition Knowledge Gaps Among Urban Adolescent Athletes

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Abstract: Nutrition knowledge is essential for making the right choices regarding diet, supplements, and hydration. For many adolescent athletes, nutrition receives too little attention, not because they are unconcerned but because they lack accurate information and resources. A lack of awareness of how diet affects the human body can negatively impact performance, recovery, and overall health in young athletes. This trend is especially pronounced in economically disadvantaged urban communities, where systemic barriers limit access to healthy food choices. This review examines the extent of nutrition knowledge gaps among urban adolescent athletes and explores the factors contributing to these gaps. Because direct research on urban adolescent athletes is limited, this review also draws on findings from adjacent populations to identify broader trends and potential disparities. Improving nutrition knowledge among adolescent athletes is not only about enhancing athletic performance but also about promoting long-term health equity in communities where athletic potential is often limited by unequal access to information, guidance, and resources.

Keywords: Adolescent Athletes, Nutrition Knowledge, Urban Food Environments, Sports Nutrition, Health Equity

Introduction

Adolescent athletes compete in cities with very different resources, and differences in team performance may reflect more than talent or effort. Physical and material barriers, including those that shape how athletes eat, may also play a role. This review focuses on one cornerstone of sports performance: nutrition.

In its most general form, nutrition knowledge is understanding dietary concepts, nutrient sources, and the relationship between diet and health. As adolescents age, nutrition knowledge is imperative to their well-being as it influences diet. This knowledge impacts food choices, or, in other words, the choices one makes about what to eat or drink. Adolescence is a period of rapid growth and development. Because of this, nutrition is integral as it supports not only these physical functions, but also cognitive and long-term health. Adolescent athletes have to consider how their diets affect their performance, recovery, injury prevention, and healthy body composition, underscoring the gravity of nutrition. Depending on factors such as training load, body size, development, climate, and sport, adolescent athletes may have increased energy, macronutrient, fluid, and micronutrient requirements. Misconceptions about supplements, weight control, and sports nutrition are common and can persist without change. Early research found that some young athletes had misconceptions about the consumption of excessive fats and sugars, and failed to recognize nutritional practices critical to the demands of athletics (Schmalz, 1993). A systematic review of athletes's nutrition knowledge found some participants to be unable to correctly identify recommended amounts of protein, fat, and

carbohydrates and incorrectly identified the role of vitamins and protein (Heaney et al., 2011). Poor nutrition for athletes can lead to consequences that affect their performance or physical health. Additionally, each sport requires a different type of athlete; some sports need someone large and muscular, while others prioritize a lean build. These factors highlight the unique importance of diet for athletes, whose demands differ from those of non-athletes.

Urban adolescents, however, face further and unique challenges when it comes to healthy eating. The potential factors that contribute to this span a wide range: limited access to nutritious foods in certain neighborhoods, exposure to plenty of food advertisements, and socioeconomic disparities. Athletes who face these obstacles may struggle to meet specific energy needs, recover effectively, or perform consistently. Health may also be affected because nutrition is vital for concentration, memory, and cognitive functions. Adolescence is a period in which lifelong habits form; poor eating can affect these individuals' futures. This is why understanding nutrition knowledge among urban adolescent athletes is an important area of study.

Methods

Sources and data were obtained from scholarly papers and databases such as PubMed and school library databases. The search strategy including keywords such as "nutrition knowledge," "sports nutrition education," "urban youth nutrition," and "food insecurity in athletes," among others, were used to identify relevant studies on the topic of this paper. Reference lists of relevant articles were also reviewed to identify additional studies related to the research question. No specific publication-year restrictions were applied, allowing for the inclusion of both foundational and more recent research. Only English-language publications were considered. Articles that examined adults were excluded, and articles on suburban or rural youth were used as points of comparison. Sources were evaluated based on their relevance to the research question, methodological rigor, and publication in reputable academic journals. Studies that discussed adolescent athletes and urban youth, or a combination of both groups, specifically were prioritized. The final review included 31 sources, comprising observational, longitudinal, and intervention studies, qualitative research, systematic and narrative reviews, meta-analyses, and professional position and consensus statements.

While previous research has examined nutrition knowledge among athletes and dietary behaviors among urban youth, it has paid limited attention to their intersection. This paper examines the limited level of nutrition knowledge among urban adolescent athletes, the reasons why that may be, and its potential influence on overall health and athletic performance.

General Nutrition Knowledge Among Adolescent Athletes

Research has found that adolescent athletes have limited knowledge of nutrition despite its critical role in athletic performance, recovery, and overall health. Diet is vital for this group because they use a lot of energy during games and practices, and they are also growing and need even more fuel. However, substantial knowledge gaps exist that may negatively impact their food choices.

Youth athletes are taught at a young age to prioritize physical fitness to be well prepared for the high demands of competitive sports, yet they frequently exhibit suboptimal or unbalanced dietary behaviors due to a lack of awareness of the vital role of nutrition. Many adolescent athletes do not meet general or sport-specific nutrition recommendations (Desbrow et al., 2014). In a study of 194 adolescent athletes, both male and female participants scored below 50% on assessments of general and sport-specific

nutrition knowledge (Gibbs & Becker, 2025). The research also identified dietary behaviors among adolescent athletes that may not align with general nutrition recommendations, including lower-than-recommended consumption of certain food groups Even if these athletes have a modest understanding of general nutrition, they still demonstrate low understanding of sport-related nutrition behaviors such as how food choices can affect athletic performance and the importance of fueling correctly. A systematic review investigated adolescent athletes and their demonstrated limited understanding of nutrition and its application to athletic performance. Across the studies, common gaps were found in supplement recommendations, hydration, and sport-specific fueling strategies (Hulland et al., 2024). Furthermore, in a pilot study of 44 adolescents, Jagim et al. (2025) found that student-athletes also misunderstood macronutrient intake, often underestimating their energy and carbohydrate needs and overestimating protein requirements. Carbohydrates serve as the body's primary source of fuel during exercise and inadequate intake may negatively affect athletic performance, recovery, and energy availability.

While limited nutrition knowledge contributes to poor dietary decisions, research suggests that the environments where many of these adolescents train and compete may reinforce unhealthy nutrition behaviors. Not only do they fail to address malnutrition, but they may even encourage harmful food choices. Food environments in community sports settings often feature energy-dense, nutrient-poor items such as sports drinks, confectionery, candy bars, cookies, chips, and soft drinks (Carter et al., 2012). These settings may also promote products through sponsorships and marketing, potentially influencing the foods and beverages that young athletes associate with sports participation. These options may provide quick energy but offer low nutritional value because of their high sugar content and low levels of other nutrients essential to athletic performance. When athletes lack the nutrition knowledge to distinguish between foods marketed for athletic performance and those that provide balanced nutritional value, these environments may reinforce misconceptions about proper sports nutrition. Conversely, repeated exposure to these foods and environments may further reinforce knowledge gaps, creating a cycle in which limited nutrition knowledge and unhealthy food environments influence dietary decisions together. In addition, frequent fast-food use among adolescents is associated with poorer nutrient intake (French et al., 2001). For adolescent athletes balancing school and sports commitments, convenience may also influence food choices, although this relationship requires further investigation. Between school, practices, and games, the time pressure doesn’t allow for an emphasis on healthy eating, which likely takes longer than getting fast food. These factors may contribute to poor dietary choices by adolescent athletes and make it more difficult to grow their nutrition knowledge and apply the principles to their diet.

Adolescence is a period of rapid growth and development from childhood to adulthood. If these youth are in competitive or recreational sports during this period of growth, their nutrition demands increase as well. Poor nutrition knowledge affects many youth, and it appears to stem largely from external factors rather than a lack of interest in the topic.

The Role of Coaches, Parents, and Schools in Nutrition Education

The responsibility for providing general and sport-specific nutrition knowledge to adolescent athletes extends beyond the athletes themselves to the adults and institutions that impact their daily lives. Receiving guidance on both aspects of nutrition is essential for their well-being as both a growing human and as an athlete. Adolescence is a highly influential period for future habits and behaviors. Because these athletes spend so much time with coaches, families, and schools, these groups can easily shape their nutrition

behaviors. Research suggests that nutrition education in these settings may be inconsistent and may provide misinformation about food or set inaccurate examples of a good diet, creating a gap in the information available to athletes.

Coaches are some of the most influential people in an adolescent athlete's life; they spend dozens of hours a week with them through practices, games, or meets, and because of this, they can develop a strong bond. Research has found that coaches are an important part of a youth's life and serve as role models for how to conduct themselves in and out of sports settings (Nichols et al., 2012). In a study evaluating the nutrition knowledge and dietary recommendations of coaches of Brazilian adolescents, the researchers found that the coaches failed to provide appropriate information to support health or improve athletic performance (Juzwiak & Ancona-Lopez, 2004). These coaches misjudged many aspects of a balanced diet for an athlete, such as focusing only on the calorie count instead of nutrient content to promote weight loss or weight gain depending on the goal; recommending increased fruit and vegetable intake before competitions, which may seem healthy but could have negative consequences due to the high fiber content; and underestimating the need for hydration during exercise, with some stating that it "broke concentration." These misconceptions could prove to be detrimental not only to an athlete's performance but also to a growing adolescent's health. Because these athletes spend significant time with their coaches, and because adult figures play an important role in their lives, they develop trust in them. Because trust is an important component of the coach–athlete relationship, coaches may influence athletes' beliefs and behaviors, including their understanding of nutrition (Jowett, 2017). If coaches lack adequate nutrition knowledge and recommend inaccurate dietary behaviors, adolescents may trust what they are told and potentially carry these false eating habits into adulthood. Similarly, studies have shown that educating coaches with even basic, surface-level information can increase their confidence and understanding of athletes' dietary needs. Comparing questionnaires on youth football coaches' nutrition knowledge before and after a 20-minute intervention showed clear improvement in understanding adolescent diet and hydration, as well as greater confidence in their ability to relay accurate information (Belski et al., 2018). While this study has not shown that the intervention improves athletes' dietary behavior, the fact that a brief intervention could quickly improve nutrition knowledge underscores how limited many coaches' nutrition knowledge is and the potential benefits of strengthening it.

While a coach's nutrition knowledge may influence some young athletes through spoken advice, parents have a similar responsibility, and they often directly decide what adolescents eat. Parents influence adolescent athlete nutrition because they control food availability, model eating behaviors, and shape attitudes toward food. To investigate the first two parental influences listed, researchers conducted a longitudinal study to examine the relationship between parent intake and home availability and adolescent intake. This study followed participants for 5 years and examined what foods were served at home, parents' eating behaviors, and adolescents' dietary intake. The results found that when parents regularly served vegetables at dinner, adolescents were consistently eating vegetables 5 years later. Additionally, the researchers found that higher parent fruit intake predicted higher young adult fruit intake as well as similar correlations with vegetables and dairy (Arcan et al., 2007). These behaviors suggest that adolescents' dietary behaviors are influenced not only by their own food preferences but also by parental eating habits and the foods available in the home. This is especially significant for young athletes because, without proper knowledge of the relationship between food and sport performance, they could unknowingly follow their parents' habits and improperly fuel themselves. Research involving younger children has also demonstrated that parental feeding practices may influence eating behaviors. Fisher and Birch (1999) found that

maternal restriction of snack foods was associated with increased snack intake among girls aged 3–5. Although these findings cannot be directly generalized to adolescent athletes, they illustrate how parental feeding practices may shape children's relationships with food. (Fisher & Birch, 1999). If parents of adolescent athletes understand the needs of sport-specific nutrition and appropriately provide the food as well as model behavior, they can support young athletes, but if they have misconceptions, they may give athletes inaccurate advice.

Schools could be an opportunity to educate students about nutrition, but there is often limited emphasis on it, including for athletes whose performance is connected to their eating habits. Adolescents spend a large part of each weekday at school. Additionally, many students receive lunch and sometimes even breakfast from their schools. School is also a place for learning and extracurricular activities, making it a sphere of influence for health behaviors. Even so, nutrition knowledge remains suboptimal for countless students. Schools shape nutrition behaviors not only through education; they also shape them by providing school meals, vending-machine snacks, and foods sold at athletic competitions. Neumark-Sztainer et al. (2005) examined the relationship between school food policies and student lunch practices and vending machine purchases to investigate the scope of influence these institutions had. They found that, outside formal education, schools significantly shape student nutrition by controlling the food environment and providing meals and snacks throughout the day. Considering this, athletes are at a further disadvantage because they are spending more time at school and school-related events for training, games, and team activities. A lack of proper nutrition education may also account for why nutrition knowledge is generally low for adolescents and adolescent athletes. A study explored nutrition education in elementary schools in Ontario, Canada, and the reasoning behind its level of effectiveness. It found that although teachers were enthusiastic about explaining nutrition to their students and recognized its importance to health, they lacked the confidence to teach it due to a lack of support for developing a nutrition curriculum (Franco-Arellano et al., 2026). Although this study is focused on elementary schools rather than secondary-school athletic programs, it highlights how limited institutional support may create challenges for providing consistent nutrition education. Beyond basic nutrition education, athletes need to understand far more than that, such as pregame fueling, hydration, recovery foods, and increased energy demand. Schools influence student nutrition through the information and actual foods they are providing. However, these often do not contribute to healthy eating and the mindset that supports it, which may create ongoing nutrition knowledge gaps.

Urban Food Environments and Barriers to Healthy Eating

Even with decent role models for dietary behavior and accurate nutrition knowledge, one’s environment can heavily influence the food choices of adolescent athletes. Factors to consider when making a dietary choice, aside from education, include availability, convenience, cost, and time. Urban adolescents may experience unique barriers to healthy eating. These barriers may be especially relevant for adolescent athletes, who often balance a full school day with practices, games, and travel, leaving limited time to get or prepare nutritious meals. Therefore, understanding urban environments is necessary to explain both the development of nutrition knowledge and the challenges athletes face in applying that knowledge to support performance and overall health.

Food deserts and food swamps reduce access to high-quality foods and provide abundant access to low-quality foods in urban areas. Urban food deserts are areas in cities where people have limited access to fruits, vegetables, and other whole foods due to the lack of a nearby supermarket (Mead, 2008). While these environments do exist in rural areas and are severe due to the sheer distance, which is 10 miles or more from a grocery store, the challenges in urban areas are unique because a lack of accessible healthy food

is accompanied by a density of unhealthy food. Urban food swamps, which often accompany food deserts in cities, are defined as neighborhoods with a disproportionate number of unhealthy food options compared to healthier outlets (Cooksey-Stowers et al., 2017). Given the situations described, many urban adolescents are exposed to unhealthy diets at an early age due to limited access to nutritious food and overexposure to highly processed food. For example, in Seoul, South Korea, some adolescents may choose unhealthy options at convenience stores, which are abundant in urban areas and where One study examining food displays at convenience-store checkout counters found that 89% of stores displayed unhealthy food items (Horsley et al., as cited in Yoon & Shon, 2020). The prevalence of these products in convenience stores increases adolescents' exposure to unhealthy food options and may influence the choices available to them (Yoon & Shon, 2020). When energy-dense, nutrient-poor foods are consistently placed in highly visible locations while healthier alternatives are less accessible, adolescent athletes' fueling decisions may shift toward less nutritious options. A study conducted by Laska et al. (2010) found that food environments, including proximity to restaurants, convenience stores, fast-food outlets, and grocery stores, were associated with adolescents' dietary patterns and choices. As adolescent athletes require additional energy sources for growth and training or competition, such as quality carbohydrates for energy, protein for recovery, fruits and vegetables for micronutrients, and fluids for hydration, a lack of access to these healthy foods could negatively affect performance. Additionally, these athletes' consumption of processed food could worsen this condition. The surrounding environment and accessibility shape adolescents' food behaviors, and the abundance of unhealthy food environments in urban areas, along with limited access to nutrient-dense foods, makes it difficult for urban athletes to meet their high nutritional fueling demands. Furthermore, when adolescents are consistently exposed to environments where processed, energy-dense foods are the most accessible options, they may come to perceive these foods as normal components of a healthy diet. This repeated exposure may limit opportunities to develop an accurate understanding of balanced nutrition and appropriate fueling strategies.

Beyond food availability, urban areas also contribute to adolescent athletes' nutrition due to high income inequality and concentrated poverty. Access to healthy food is not determined only by physical availability but also by economic capacity, which can shape dietary patterns in low-income urban populations. Some neighborhoods in cities face structural economic disadvantage, while others are quite wealthy, creating financial segregation. This disparity often results from structural issues and may lead to unequal access to the resources needed for consistent healthy eating. To understand the factors contributing to this economic inequality in urban areas, Quillian (2012) examined how income segregation influences the concentration of poverty in cities. This study found that segregation leads to uneven socioeconomic status across neighborhoods, making some areas significantly more economically disadvantaged than others. This concentration of poverty means that socioeconomic inequality is a neighborhood issue, with entire communities experiencing reduced access to resources, services, and economic opportunities. As a result, people living in these areas may face structural limitations that go beyond personal income and influence their overall living conditions. To examine how this phenomenon affects these communities' nutrition, Vilar-Compte et al. (2021) conducted a systematic review of the relationship between urban poverty and dietary outcomes. This review found that socioeconomic disadvantages are associated with reduced access to healthy diets, increased food insecurity, and greater reliance on less nutritious, energy-dense foods. Financial limitations were identified as barriers that prevented households from obtaining sufficient quantities of healthy foods, even in urban areas where food options may be available. These findings suggest that food access

depends on both geography and affordability. These economic limitations may prevent individuals from obtaining nutritious foods, even when they understand the importance of a balanced diet. Limited food access does not necessarily indicate inadequate nutrition knowledge; rather, it may create barriers to applying that knowledge in daily life. This distinction is particularly important for adolescent athletes, whose nutritional requirements increase with growth and athletic participation. Together, these studies show that urban socioeconomic conditions, which are both structural and household-specific, limit access to nutritious foods. Structural inequality concentrates economic disadvantage in certain areas, and financial constraints reduce the amount of healthy food that is available. For adolescent athletes in these environments, these barriers may be especially impactful because their energy and nutrient needs increase with growth, training, and recovery.

Food marketing and advertising also play an important role in shaping adolescents' nutritional knowledge in urban areas. In addition to formal education, youth frequently encounter food-related messages through social media, television, and the physical food environment. These sources can often shape adolescents' understanding of food and nutrition. Researchers examined how food marketing in the media influences youth dietary behaviors. The systematic review analyzed the effects of food advertising on multiple forms of media and found that exposure to unhealthy food marketing was associated with less healthy eating choices. Additionally, the study found that repeated marketing influenced adolescent food-related attitudes, cognitions, and preferences (Qutteina et al., 2019). These results suggest that food advertising may do more than just encourage the purchase of unhealthy foods; it may also shape adolescents' perceptions of which foods are appropriate for a normal diet. This influence may be particularly relevant for adolescent athletes, who frequently see advertisements promoting products as tools to improve athletic performance. Marketing for sports drinks, energy drinks, protein supplements, and high-protein snack foods may lead athletes to associate these products with optimal performance, even though many are not necessary for their age or level of competition. Repeated exposure to media can shape nutrition beliefs that conflict with recommendations among impressionable adolescents. Further research has demonstrated that these influences have expanded with the advent of digital media. Ilieva et al. (2025) reviewed more than 100 studies examining unhealthy food marketing directed at adolescents and young adults. They found that many studies reported an association between exposure to unhealthy advertisements and an increase in consumption of the product as well as highlighted the growing influence of social media in shaping food perceptions. Food marketing is frequent, persuasive, and designed to capture the attention of youth. For urban adolescent athletes, whose food choices directly influence performance and recovery, relying on marketing-driven information rather than evidence-based education may perpetuate nutrition knowledge gaps. Additionally, some athletes may have adequate nutrition knowledge but face cost and accessibility barriers that prevent them from making healthy dietary choices.

How Barriers Affect Athletic Performance and Recovery

Urban environments can create barriers that prevent the development and application of nutrition knowledge, which may in turn influence dietary behaviors in adolescents. Given what has been previously discussed regarding the greater nutritional demands that come with being an athlete, it is important to understand how these demands can affect athletic performance and recovery. The following section explains how the barriers discussed in the previous section may influence urban adolescent athletes' performance, recovery, and physical fitness.

Energy intake, carbohydrate and protein consumption, micronutrient adequacy, and hydration all contribute to an athlete's ability to exercise, recover between training sessions, and maintain physical health. Because adolescent athletes must meet the nutritional demands of both physical development and athletic training, adequate nutrition knowledge is essential for supporting endurance, recovery, and healthy growth. As mentioned, urban barriers may affect adolescents in two distinct ways: they could limit athletes' ability to make adequate dietary choices through a lack of nutrition knowledge, or they may prevent them from obtaining high-quality food (even if they know it is the right choice) due to disparities in accessibility. Researchers from the Academy of Nutrition and Dietetics (AND), Dietitians of Canada (DC), and the American College of Sports Medicine (ACSM) produced a joint position statement with official nutrition recommendations. The statement concludes that athletes have higher energy needs because of training and competition. Within this high demand, protein and carbohydrates were identified as especially important, as carbohydrates replenish glycogen for endurance and protein helps muscle repair for recovery. Additionally, the timing of nutrient intake also influences performance (Thomas et al., 2016). Because athletes have more demanding nutrition requirements, their nutrition habits have greater consequences. For example, practice quality, physical development, and endurance are all heavily dependent on an athlete having sufficient energy, micronutrients, macronutrients, and hydration. Importantly, failure to meet these recommendations does not necessarily indicate a lack of nutrition knowledge; an athlete may understand appropriate dietary practices but still be unable to follow them because nutritious foods are inaccessible or unaffordable. Conversely, when the barrier is a lack of knowledge rather than access, athletes may be unable to identify the appropriate foods, quantities, or timing needed to meet these recommendations.

Without an accurate understanding of these recommendations, adolescent athletes may unknowingly fail to consume sufficient energy or nutrients to support both athletic performance and normal growth. Desbrow et al. (2014) attempted to connect these ideas back to adolescents. The researchers found that youth athletes have dual demands because they need nutrients for growth and athletic performance. The position statement emphasizes that adolescent athletes must meet the combined nutritional demands of growth and athletic participation. It also explains that inadequate carbohydrate and energy intake may contribute to fatigue, reduced training quality, and impaired adaptation. Taken together, these findings demonstrate that adolescent athletes have nutritional demands that extend beyond those of their non-athlete peers due to the combined requirements of growth and athletic participation. Meeting these recommendations requires both general and sport-specific nutrition knowledge, as athletes must understand not only what to eat but also how much and when to eat to fuel training and competition properly. For urban adolescent athletes, these demands may be particularly difficult to meet when barriers limit either their ability to develop accurate nutrition knowledge or their ability to apply that knowledge through consistent access to nutritious foods.

Inadequate nutrition not only reduces performance during competition but also impairs recovery between training sessions, increases fatigue, and elevates injury risk. Because adolescent athletes are still growing, these consequences may be especially significant. To examine the health and performance consequences of inadequate energy intake in athletes, Mountjoy et al. (2018) developed a consensus on relative energy deficiency in sport. The research found that low energy availability, in which athletes do not have enough dietary energy to support them in both exercise and normal functions, leads to impaired muscle recovery, increased fatigue, higher injury risk, and reduced bone health. The consensus statement applies to athletes across ages and sporting levels, and its framework is especially relevant to adolescent athletes, who face both the energy demands of sport and the additional nutritional demands of growth and development. If athletes do not get the nutrients needed to recover well, they may not be able to train

consistently, and as poor recovery accumulates, performance can decline over time. Adolescents are especially vulnerable to these effects because they face two competing demands at the same time: growth and performance. An earlier American College of Sports Medicine position stand on the female athlete triad described how low energy availability in female athletes is linked to menstrual dysfunction, reduced bone mineral density, and stress fractures (Nattiv et al., 2007). While this paper focused on females, more recent research has shown comparable impacts in male athletes as well. A recent study found that male athletes aged 15–30 who experienced low energy availability were more likely to exhibit reduced endurance performance, diminished training response, and decreased muscle strength. Although the sample included some adolescent athletes, the findings cannot be generalized to adolescents alone. Nevertheless, the study provides additional evidence that low energy availability may be associated with negative health and performance outcomes in male athletes. These outcomes may reflect chronically inadequate nutrition rather than training load alone (Holtzman et al., 2025). Taken together, these sources show that, while the outcomes may differ, inadequate energy availability has consequences beyond immediate athletic performance across both sexes. Nattiv et al. (2007) showed how prolonged energy deficiency can contribute to serious outcomes such as stress fractures, and Mountjoy et al. (2018) later broadened this framework to cover effects on recovery, health, and performance in both sexes. Together, these statements suggest that the physiological consequences of inadequate energy availability may become more serious if nutritional deficiencies continue over time. Collectively, these findings emphasize that proper nutrition is necessary not only to optimize performance but also to protect the long-term health of adolescent athletes. However, meeting these nutritional demands requires athletes to understand concepts such as energy availability, recovery fueling, and nutrient timing. Without adequate nutrition knowledge, adolescent athletes may unknowingly fail to meet these requirements and increase their risk of impaired recovery and performance consequences. For adolescent athletes in urban environments, these consequences may worsen because barriers to accessing accurate nutrition information and meeting dietary recommendations can make it more difficult to prevent inadequate fueling.

While inadequate nutrition can negatively affect all athletes, urban adolescent athletes may face additional challenges in meeting the nutritional demands of optimal performance and recovery. These athletes must balance the increased energy requirements of sports with environmental barriers that can limit their ability to access accurate nutrition information and consistently apply healthy fueling habits. To understand how urban areas influence athletic participation in youth, researchers analyzed sports involvement among 9,400 children from varying socioeconomic backgrounds. They found that children from socioeconomically disadvantaged neighborhoods participated in approximately 1.5 fewer sports than children from affluent neighborhoods. They also had significantly lower involvement in team sports (Shih et al., 2026). Less participation may also reduce opportunities for some young people to develop sport-specific skills and access the resources associated with organized athletic programs. However, the study did not directly examine access to nutrition education or athletic training. Athletic development also reflects physical fitness. To examine whether this varied depending on neighborhood, researchers evaluated aerobic capacity and muscular fitness among New York City public school students. The findings showed lower aerobic capacity, muscular endurance, and muscular strength among students from disadvantaged neighborhoods (Day et al., 2026). Although these differences in physical fitness may reflect socioeconomic, environmental, and individual factors, the findings highlight disparities in physical fitness among New York City public-school students. Given the established relationship between adequate nutrition and athletic recovery, nutritional

barriers may be one factor worth investigating, although this study did not directly examine nutrition as an explanation for these differences. Since nutrition is essential for supporting training, recovery, and physical development, the urban barriers discussed throughout this paper may place adolescent athletes at a disadvantage. These barriers operate at multiple levels, such as education, environment, and economics, which may manifest as limited nutrition knowledge, reduced opportunities for athletic participation, limited food accessibility and unaffordable prices for nutritious foods. These factors make it increasingly difficult for urban athletes to recover and perform well, thus preventing them from reaching their full athletic potential.

Conclusion: Moving Beyond Individual Responsibility in Athlete Nutrition

Despite its importance to athletic performance, recovery, growth, and long-term health, knowledge of nutrition among urban adolescent athletes remains inadequate. This review suggests that dietary knowledge gaps are not simply due to individual choices or ignorance of the topic. Instead, several interconnected factors may influence adolescents. For instance, institutions and influential adult figures who may hold nutrition misconceptions play a significant role in young people's lives and could influence their perceptions of diet. Additionally, an athlete's environment affects their exposure to nutritious options and their affordability. Together, these variables affect the ability to develop reliable nutrition knowledge. Consequently, adolescent athletes in urban environments may struggle to develop and apply this knowledge before they are fully responsible for making independent dietary decisions without the influence of these institutions and adults. This may be an issue, as inadequate nutrition knowledge or limited access to nutritious foods could harm an athlete's performance and recovery.

The findings discussed in this review highlight that nutrition knowledge cannot be treated purely as an individual responsibility but rather as the result of multiple components. Inconsistencies among these components may manifest in an adolescent athlete in two ways: they may be unaware of proper fueling due to misleading information, or they may know what to eat but struggle to do so because of circumstantial barriers. Adolescents may never have been taught accurate nutrition information, or a behavior gap may develop when adolescents understand the recommendations but cannot realistically follow them. As these athletes have high nutritional demands resulting from growth as well as elevated energy usage from training, competition, and recovery, consequences of inaccurate dietary habits may be particularly meaningful for their bodily functions. While nutrition matters for everyone, it has particular repercussions for this group, whose members need both to develop as young adults and to use a great amount of dietary energy to support themselves as athletes. Educational interventions alone might not be sufficient as situational barriers must also be considered. School athletic programs could incorporate practical sports nutrition education into team activities, while providing coaches with basic nutrition training to help reinforce accurate dietary guidance. Additionally, schools could partner with community organizations and nutrition professionals to improve access to affordable, nutrient-dense snacks and meals at athletic facilities. Simple encouragement of "healthy eating" is often given to adolescent athletes; however, it is not specific to the different requirements and may not be effective.

Beyond the individual, many things can improve nutrition knowledge. Schools influence students' dietary patterns through the quality of nutrition education, school meal programs, and the overall school food environment. These institutions could provide formal nutrition education and make nutritious foods available instead of quick, processed foods to foster good eating habits. Parents and other important adults can similarly model eating behaviors, make nutrient-dense foods available at home, and reinforce these healthy habits. For athletes specifically, coaches have a considerable impact as they are

trusted to relay accurate, sport-specific advice. In turn, they could influence beliefs about performance nutrition by providing evidence-based guidance. Athletic programs also play a substantial role in shaping nutrition knowledge and could offer nutrition workshops, provide nourishing snacks during practices and competitions, and increase access to resources in underserved communities to improve athletes' fueling. Accurate nutrition education without access may be ineffective, while improved food access without nutrition education may fail to change dietary behaviors. Therefore, a true solution should work to address both of these factors to accomplish this goal.

Little existing research focuses specifically on urban adolescent athletes. As a result, this review integrated findings from multiple populations, such as adolescents, adolescent athletes, urban youth, or combinations of these. Another limitation is that much of the evidence discussed shows association rather than causation. For example, lower socioeconomic background was associated with poorer dietary outcomes, and nutrition knowledge was correlated with dietary intake (Spronk et al., 2014). There is no proof, however, that one factor directly caused the other. A related limitation is that many studies measure dietary behaviors rather than nutrition knowledge. This makes it difficult to distinguish whether poor dietary habits resulted from inadequate education, economic barriers, limited access, time constraints, or a mix of all of these factors. Future studies should examine urban adolescent athletes specifically, assess nutrition knowledge and dietary behaviors simultaneously, and investigate how socioeconomic barriers influence both knowledge and application. Addressing both educational and structural barriers is essential, as nutrition education alone cannot overcome limited food access, just as improved food availability cannot fully address gaps in nutritional understanding. Improving nutrition among adolescent athletes requires more than encouraging healthier choices; it requires educational and environmental systems that allow for accurate nutrition knowledge to be developed and realistically applied.

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