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General and sport-specific nutrition knowledge and behaviors of adolescent athletes

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ABSTRACT

Introduction: Most youth do not meet national nutrition recommendations and overconsume high-calorie, low nutrient-dense foods. Adequate nutritional intake is crucial for growth and development. Nutrition practices play a key role in sports performance and recovery. Nutritional knowledge can affect eating patterns. However, there is limited research on general and sport-specific nutrition knowledge and behaviors of adolescent athletes.

Purpose: To examine general and sport-specific nutrition knowledge and behaviors of adolescent athletes.

Methods: Adolescent athletes were assessed on nutrition knowledge and general and sport-specific nutrition behaviors, including food group consumption, hydration practices, and sport supplement use. Gender differences in general and sport-specific nutrition behaviors were compared using a Mann-Whitney U test. Odds ratios and logistic regression, controlling for age, ethnicity, and years in sport participation were used to determine differences in correct responses between genders. Significance was set at the $p < 0.05$ level.

Results: One hundred and ninety-four athletes ($n = 63$ male, $n = 132$ female, mean age $= 14.9 \pm 1.63$ years) were assessed. Differences in nutrition behaviors were found in fruit, dairy, and sugary beverage consumption between genders. Male athletes were more likely to monitor hydration and use sports supplements. Both males and females scored less than 50% on both general and sport-specific knowledge questions.

Conclusion: Adolescent athletes report lower than recommended food group consumption and lack knowledge of general and sport-specific nutrition information. Improvements in these areas can play a significant role in the health and performance of adolescent athletes.

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1. Introduction

Youth sport participation has grown in scope and popularity over the last several decades. Recent data show that almost 51% of youth participate in some level of organized sport

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[1]. This increased popularity has opened the doors for coaches and professional organizations to create programs and resources around improving technical and tactical approaches to sport performance. However, the role of nutrition on sports performance, a main component of athletic performance and recovery, has been vastly overlooked [2]. Adequate nutrition is vital for the adolescent athlete, both on and off the field of play [3].

Adolescence is a time of rapid growth and development which requires more energy than any other time during the life cycle [4]. Adequate nutrition intake is important to foster development, yet most youth fail to meet national dietary guidelines and overconsume low-nutrient, "empty calorie" foods [5]. The U.S. Department of Agriculture (USDA) recommends a minimum daily intake of 1.5 cups of fruit and 2.5 cups of vegetables for females aged 14–18 years, and 2 cups of fruit and 3 cups of vegetables for males aged 14–18 years [6]. Recent data reveal that only 7.1% and 2% of high school-aged youth meet recommendations for fruit and vegetables, respectively [7]. Furthermore, data from the National Health and Nutrition Examination Survey (NHANES) show that over 30% of daily energy for children and adolescents came from foods high in solid fats and added sugars [8]. As eating behaviors have been shown to track into adulthood, it is important to educate and reinforce healthy eating patterns at a young age [9].

While adequate nutritional intake is important for growth and development during adolescence, it is also critical when considering the needs of an adolescent athlete. Increased energy demands from sport participation warrant the need for optimal nutrition intake to support athletic performance, improve recovery, reduce physical and mental fatigue, and reduce the risk of injury [2,10,11]. Further, evidence-based sports nutrition behaviors have been shown to improve performance and recovery from exercise and sport [12,13]. While there is some evidence to suggest that adolescent athletes have slightly better nutrition behaviors than their non-athlete counterparts, including better fruit and vegetable consumption [14] there is still much work to be done. Additionally, this area has been underrepresented in the literature, especially eating behaviors among non-elite adolescent athletes [15].

Research has shown that knowledge around nutrition and healthy eating behaviors is associated with better diet quality, yet many adolescents do not possess these skills [16]. Further, adolescent athletes that are aware of the sport-specific nutrition behaviors, such as hydration practices and timing of intake, can improve their potential for performance and recovery [11]. A recent systematic review consisting of 32 studies representing 4553 adolescents, indicated that there is a need to educate youth on best sports nutrition practices [17]. Indeed, research reveals that youth are lacking knowledge of best sports nutrition practices [14,18,19]. For example, in a group of 101 elite youth, Australian athletes, 51%, 27%, 46%, and 54%, of participants correctly answered questions pertaining to nutrients, daily reference intakes (DRIs), hydration, and recovery, respectively [14]. Furthermore, in a group of 535 high-school soccer players from 13 Oregon schools that were recruited for the WAVE project, it was discovered that at baseline average sports knowledge score was 45.6%, protein/carbohydrate knowledge score was 35.5%, and pre/post-exercise food selection score was 24.3% [18].

Most of the research examining sports nutrition behaviors in youth have been performed outside of the United States [20–22], while little research has examined sports nutrition knowledge among youth in the United States [18,19,23]. Additionally, there may be gender differences regarding sports nutrition best practices knowledge [20,24]. In

a study of 101 youth athletes from Australia, females compared to males obtained more correct responses on a survey inquiring about sports nutrition knowledge [20]. Similarly, it was observed in a sample of 348 youth athletes from four countries that female athletes had significantly greater knowledge of the proper use of various sports nutrition supplements compared to their male counterparts [24]. In contrast, Magee and colleagues observed no significant differences in sports nutrition knowledge between male and female athletes, however both sexes scored quite low (both less than 40%) [19]. Similarly, Manore and colleagues observed no significant differences in an overall sports nutrition knowledge score between 535 male and female youth athletes, although the relationship was approaching significance (p=.08) [18]. To date, little research has further compared sports nutrition knowledge categories between males and females to examine if differences exist.

Therefore, the purpose of this study was to examine general and sport-specific nutrition knowledge and behaviors among adolescent athletes and compare sports nutrition knowledge categories between male and female athletes. Furthermore, another objective was to compare the percentage of male vs. female athletes practicing sports nutrition recommendations.

2. Materials and methods

2.1. Participants

Participants consisted of adolescent athletes from Michigan, Arizona, and California who were originally recruited to participate in the Peak Health and Performance (PHP) program [25]. Michigan athletes were recruited through the Michigan High School Athletic Association (MHSAA), Michigan Interscholastic Athletic Administrators Association (MIAAA), and contact with various club organizations in the mid-Michigan area as part of a dissertation study from 2016 to 2019. Arizona and California participants joined the study after their coaches were made aware of the PHP program through *The Sports Journal* publication [25] and participated from 2021 to 2023. Information detailing the nature of the study was sent to coaches and athletic administrators through electronic mail (e-mail). A total of 194 youth athletes completed a survey at baseline.

2.2. Measurements

2.2.1. General and sports-specific nutrition behaviors

Dietary intake was measured using a subset of questions from the School Physical Activity and Nutrition (SPAN) survey. This instrument included items pertaining to food group consumption, beverage consumption, frequency of meals and snacks, breakfast consumption, and use of dietary supplements. Previous studies have shown good reliability and validity for measuring nutrition behaviors compared to a simultaneous 24-hour recall [26,27]. Athletes were asked to report on their consumption of foods from each food group and frequency of meals from the previous day, with responses anchored at "0 – None" to "5 – Five or more times." An updated version of this survey was released in 2019 which reduced the anchors to "0 - None" to "3 – 3 or more times." Questions from the previous version were recoded to match the new scales. A Healthy Food Index (HFI) and

Unhealthy Food Index (UFI) was calculated for each athlete [28–31]. A cutoff score of 5≤ HFI ≤ 30 and 5 ≤UFI ≤ 30 were used as previous studies had determined these to be acceptable ranges of realistic eating patterns [32].

Knowledge was assessed using a 20-item subset of questions pertaining to nutrition and sports-nutrition best practices. Questions for this subset were similarly modeled after a coach and athlete survey utilized by Torres-McGehee et. al [33] which examined nutrition knowledge of four sport-specific domains (macronutrients and micronutrients, supplements and performance, weight management, and eating disorders) of Division 1 coaches, athletes, and athletic trainers. Items in this section measure the ability to correctly identify information related to general and sport-specific recommendations as outlined by the Academy of Nutrition and Dietetics, Dietitians of Canada (DC), and the American College of Sports Medicine (ACSM) position statement [12]. All questions were assessed for content validity by staff and faculty at Michigan State University, Division of Sports and Cardiovascular Nutrition, College of Osteopathic Medicine, East Lansing, MI and Spartan Performance Training Center, East Lansing, MI, including pediatric exercise physiologists, a registered dietician, and a health educator. Topics include functions of macronutrients (protein, carbohydrates, fat), micronutrients, hydration, and weight management/food group recommendations. Each question is formatted as a multiple-choice question and scores were calculated based on the number of correct responses given, with each question being worth 1 point, out of 20 possible points.

Questions for the protein category included: 1) an athlete's protein needs are determined by; 2) with respect to protein intake among athletes; and 3) for athletes, calories from protein should be approximately:. Questions for the carbohydrates category included: 1) carbohydrates should be consumed in an athlete's diet:; 2) the majority of an athlete's carbohydrates should be; 3) for athletes, calories from carbohydrates should be approximately; and 4) which of the following are examples of simple carbohydrates?. Fats category questions included: 1) what types of foods will cause an increase in inflammation and delay recovery?; 2) which of the following are examples of saturated fat?. 3) when dining at a fast food restaurant, a healthier low fat food selection would be:; and 4) what is wrong with an athlete eating a 12–16-ounce Ribeye steak, baked potato with butter, green beans, and soda 2 hours prior to an event?. The micronutrient category questions included: 1) the vitamin and mineral needs of athletes are met best by; and 2) athletes should consume vitamin supplements because:. Questions for the hydration section included: 1) regarding water intake, athletes should drink; 2) at what percentage does dehydration start to decrease performance in athletes?; and 3) assume you weigh yourself before and after a workout. To properly rehydrate, it is recommended you consume how many cups of fluid per pound of bodyweight lost? Questions for the weight management/food group recommendations included: 1) according to the USDA MyPlate, which of the following is not a food group?; 2) appropriate, healthy weight gain is achieved by; 3) to meet nutritional needs, athletes should consume approximately; and 4) what foods should be included in the greatest number of servings per day for athletes during intense training periods?.

A subset of seven questions measured sport-specific nutrition behaviors. These questions are formatted on a 5-point Likert scale (1 – "Never" to 5 – "Always"). Topics measured include daily monitoring of hydration status, consuming a meal or snack both before and after an event, taking vitamins, herbal supplements, sports supplements, and energy

drinks. These questions assess the ability to meet recommendations of these behaviors based on the Academy of Nutrition and Dietetics, DC, and ACSM position statement [12] and were created specifically for this study.

2.2.2. Demographic and descriptive information

Demographic and descriptive information was assessed on the survey with participants providing responses to age, gender, ethnicity, and years of sport participation. Responses for years of sport participation included: 0 years; 0–2 years; 3–5 years; 6–8 years; 8–10 years; and 10 or more years.

2.3. Statistical analyses

Descriptive information were compared using *t*-tests and chi-squares. General and sport-specific nutrition behaviors were compared using a Mann-Whitney U test due to the ordinal nature of the data. Differences in the proportion of correct responses to general and sports nutrition knowledge questions were compared using a chi-square test, with odds of correctly answering the question in females vs males compared using a logistic regression controlling for age, ethnicity, and years of sport participation. Statistical analyses were compared using SPSS version 28 (SPSS Inc., Chicago, IL) with differences determined using a $p < .05$ or a 95% confidence interval.

3. Results

Descriptive information is provided in Table 1. A total of 194 athletes ($n = 63$ males; $n = 131$ females) completed baseline measurements. Males were significantly older than females (15.4 ± 1.25 y vs 14.6 ± 1.74 y; $p < 0.001$) in this sample. There were no significant differences in ethnicity nor years of sports participation group between sexes.

3.1. General and sports-specific nutrition behaviors

General nutrition behaviors are summarized in Table 2. Female athletes consume significantly more fruits than male athletes (Male: 1.15 ± 0.95 times per day; Female: 1.50 ± 1.00 times per day; $p = 0.04$), whereas male athletes reported significantly higher dairy consumption (Male: 3.70 ± 1.91 times per day; Female: 2.35 ± 1.91 times per day; $p < 0.001$) and sugary beverage consumption (Male: 1.12 ± 1.19 times per day; Female: 0.76 ± 1.09 times per day; $p = 0.004$) as compared to female athletes. Though there were differences observed in vegetable consumption, these were not found to be significant. Examining aggregated nutrition scores, there were no significant differences among HFI scores between genders, however male athletes did report significantly higher UFI scores compared to female athletes (Male: 8.63 ± 5.48; Female: 6.20 ± 3.53; $p = 0.002$).

The percentage of sports nutrition best practices followed by male and female athletes is presented in Table 3. It was found that male athletes were more likely to monitor their hydration status during the day compared to female athletes. Further, male athletes reported higher use of sport supplements, while females reported higher use of vitamin and mineral supplements. With respect to post-competition meals, female athletes did

Table 1. Demographic and descriptive characteristics of male and female athletes.

Characteristic	Males		Females		
	n	%	*n*	%	*p*
Ethnicity					0.13
Caucasian	42	66.7	73	56.2	
African American	6	9.5	18	13.8	
Asian American	1	1.6	12	9.2	
American Indian/Alaskan Native	2	3.2	1	0.8	
Hispanic/Latino	3	4.8	12	9.2	
Multi-racial	9	14.2	14	10.8	
Years in Sport					0.52
0–2 years	2	3.2	11	8.4	
3–5 years	7	11.1	23	17.6	
6–8 years	12	19.0	24	18.3	
8–10 years	20	15.9	30	22.9	
10+ years	32	50.8	43	32.8	

	n	*M*	*SD*	*n*	*M*	*SD*	*p*
Age (years)	63	15.4	1.25	131	14.6	1.74	<0.001

Table 2. Dietary intake by gender.

Food Group	Group	*N*	Mean Rank	*U*	*z*	*p*
Total Vegetable Consumption	Males	60	82.87	3142.00	−1.87	0.06
	Females	125	97.86			
Total Fruit Consumption	Males	60	81.18	3040.50	−2.10	0.04
	Females	125	97.98			
Total Whole Grain Consumption	Males	60	100.99	3270.50	−1.50	0.13
	Females	125	89.16			
Total Dairy Consumption	Males	60	118.13	2242.00	−4.48	<0.001
	Females	125	80.94			
Sugary Beverage Consumption	Males	60	108.28	2833.00	−2.89	0.004
	Females	125	85.66			
Healthy Food Index (HFI)	Males	60	94.33	3550.00	−0.42	0.68
	Females	125	90.86			
Unhealthy Food Index (UFI)	Males	60	110.05	2667.00	−3.13	0.002
	Females	125	84.01			

report slightly higher consumption and the difference was trending toward significance ($p = 0.07$).

3.2. Sports nutrition knowledge

Female athletes had slightly higher general nutrition knowledge scores compared to male athletes (4.81 vs. 4.54), but the differences were not found to be significant, while male athletes did show to be more knowledgeable on sport-specific nutrition topics

Table 3. Sport-specific nutrition behaviors by gender.

Sports-Specific Nutrition Behavior	Group	*N*	Mean Rank	*U*	*z*	*p*
Check Hydration	Males	60	106.02	2969.00	−2.35	0.02
	Females	125	86.75			
Pre-Competition Meal	Males	60	98.16	3440.50	−0.96	0.34
	Females	125	90.52			
Post-Competition Meal	Males	60	83.23	3163.50	−1.80	0.07
	Females	125	97.69			
Sport Supplement Use	Males	60	111.35	2649.00	−4.23	<0.001
	Females	125	84.19			
Energy Drink Consumption	Males	60	96.49	3540.50	−0.70	0.49
	Females	125	91.32			
Vitamin and Mineral Use	Males	60	79.33	2929.50	−2.49	0.01
	Females	125	99.56			
Herbal Supplement Use	Males	60	92.20	3702.00	−0.18	0.86
	Females	125	93.38			

(Male: 4.42 ± 1.58; Female: 3.90 ± 1.54; $p = 0.04$) (Table 4). Looking closer, it was found that significantly more female athletes correctly identified all of the USDA MyPlate food groups compared to their male counterparts (76.8% vs 61.4%; $p = 0.03$, respectively). Significantly more male than female athletes correctly identified that the majority of an athlete's carbohydrates should come from complex carbohydrates. More female than male athletes correctly identified that foods high in saturated fats will cause an increase in inflammation and delay recovery (54.4% vs 36.8%; $p = .03$, respectively). After adjusting for age, ethnicity, and years in sport, females were 2.15 times more likely to correctly answer the preceding question. 66.7% vs 45.6% of male vs female athletes, respectively, correct identified the percentage of daily calories that should come from protein. Compared to females, males had a greater odds of correctly identifying the percentage of daily calories coming from protein (OR: .39, CI: .20, .78). A greater percentage of female athletes were able to correctly identify examples of simple carbohydrates from a list compared to their male counterparts (14.4% vs 1.8%; $p = .01$, respectively). This relationship disappeared after controlling for age, ethnicity, and years in sport. There were no other significant differences in the percentage of correct sports nutrition questions by sex.

4. Discussion

This study aims to provide a better understanding of adolescent athlete nutrition knowledge and behaviors. Overall, it was found that adolescent athletes fail to meet nutrition recommendations for general and sport-specific guidelines. Further, it was found that these athletes do not possess adequate knowledge of general and sport-specific recommendations.

The data reveal that adolescent athletes do not meet dietary recommendations for adequate food group consumption and regularly consume "empty calorie" foods such as sweets and sugary beverages. Looking at existing data on adolescent nutrition behaviors, these results are not surprising. Merlo et al. [34] examined data collected from 2009 to 2019 using the Youth Risk Behavior Surveillance Survey (YRBSS) and found that 41.8% and 40.7% of high school-aged youth consumed fruit and vegetables less than 1 time per day, respectively. The authors also reported that 15% of those surveyed consumed sugary beverages more than 1 time per day, with males consuming these beverages more

Table 4. Percentage of correct sports nutrition knowledge responses between male and female (ref) adolescent athletes.

	Male		Female				
Knowledge Item	*n*	%	*n*	%	*p*	*Adjusted OR*[a]	*95% CI*
Protein							
Which of the following are true regarding an athlete's protein intake. *Answer: Needs are determined by their gender, body size, and age; and needs are determined by the type of sport and training done*	42	73.7	78	62.4	.14	.64	.32, 1.31
With respect to protein intake among athletes:. *Answer: A balanced diet provides all of the protein that is needed*	39	68.4	85	68.0	.96	1.28	.62, 2.63
For athletes, calories from protein should be approximately. *Answer: 10%-35% of their daily caloric intake*	38	66.7	57	45.6	.01	.39	.20, .78
Carbohydrates							
Carbohydrates should be consumed in an athlete's diet:. *Answer: Before a game or training session; if the exercise is prolonged; and right after a game or training session*	15	26.3	26	20.8	.41	.64	.30, 1.38
The majority of an athlete's carbohydrates should be. *Answer: Complex carbohydrates*	34	59.6	49	39.2	.01	.46	.24, .89
For athletes, calories from carbohydrates should be approximately. *Answer: 45%-65% of their daily caloric intake*	9	15.8	30	24.0	.21	1.50	.64, 3.52
Which of the following are examples of simple carbohydrates?: *Answer*: *Cookies and table sugar*	1	1.80	18	14.4	.01	7.20	.91, 56.9
Fats							
What types of foods will cause an increase in inflammation and delay recovery?: *Answer: Saturated fats*	21	36.8	68	54.4	.03	2.15	1.11, 4.18
Which of the following are good examples of saturated fat?. *Answer: Butter*	17	29.8	40	32.0	.77	1.27	.62, 2.54
When dining at a fast food restaurant, a healthier low fat food selection would be:. *Answer: Grilled chicken sandwich*	24	42.1	48	38.4	.64	1.21	.61, 2.42
What is wrong with an athlete eating a 12–16-ounce Ribeye steak, baked potato with butter, green beans and soda 2 hours prior to an event?: *Answer: The high fat meal will take longer to digest and hinder performance*	63	100	119	90.8	.01	–	–[b]
Micronutrients							
The vitamin and mineral needs of athletes are best met by:. *Answer: Eating a balanced diet*	96	76.8	138	75.8	.65	1.24	.58, 2.63
Athletes should consume vitamin supplements because: *Answer: Supplements are not needed with a balanced diet*	11	19.3	23	18.4	.89	1.02	.45, 2.32
Hydration							
Regarding water intake, athletes should drink: *Answer: 17-20 ounces of water before activity and 7-10 ounces every 10-20 minutes*	19	33.3	31	24.8	.23	.67	.33, 1.36
At what percentage does dehydration start to decrease performance in athletes? *Answer: 2–3%*	11	19.3	14	11.2	.14	.65	.27, 1.59
Assume you weigh yourself before and after a workout. To properly rehydrate, it is recommended you consume how many cups of fluid per pound of bodyweight lost?. *Answer: 3 cups*	19	33.3	52	41.6	.29	1.31	.65, 2.64
Weight Management/Food Group Recommendations							
According to the USDA MyPlate, which of the following is not a food group?. *Answer: All of the above are food groups*	35	61.4	96	76.8	.03	2.27	1.12, 4.59
Appropriate, healthy weight gain is achieved by. *Increasing calories by increasing intake from all food groups*	14	24.6	27	21.6	.66	.80	.37, 1.73
Which of the following is true regarding the amount of calories an athlete needs per day? Answer. *Calorie needs are determined by age, gender, sport and training program*	38	66.7	99	79.2	.07	2.03	.99, 4.23
What foods should be included in the greatest number of servings per day for athletes during intense training periods? *Answer: Cereal, pasta, fruit*	16	28.1	28	22.4	.41	.85	.41, 1.78

[a]Adjusted for age, ethnicity, and years of sport participation.
[b]Unable to calculate odds ratio.

frequently than females. Further, using 2005–2006 NHANES data, Reedy and Krebs-Smith [35] found that soda and fruit drinks made up the majority of "empty calorie" foods consumed by adolescent males and females. These consumption patterns are also similar among adolescents involved in athletics. In a 3-year longitudinal study, Aerenhouts et al. [36] found that male and female athletes did not meet recommendations for fruit and vegetable consumption and also reported higher sugary beverage consumption among male athletes. As it has been shown that diet quality tends to diminish as adolescents track into adulthood, these findings suggest a need to intervene to help improve diet quality [5].

One factor that may contribute to the reported dietary intake in the present study is the level of knowledge reported by our participants. In general, both general and sport-specific knowledge scores were low-to-moderate, which is consistent with the existing literature. In a recent systematic review, Hulland et al. [17] found that adolescent athletes had a modest understanding of general nutrition-related items, but demonstrated that understanding of sports-related behaviors, such a supplement use, was much lower. Similarly, Patton-Lopez et al. [37] showed moderate baseline sports nutrition knowledge (5.16 out of 10 possible points) among a group of adolescent athletes participating in the WAVE project. This project measured knowledge pertaining to hydration practices, pre- and post-workout nutrition practices, and knowledge around macronutrient intake and supplements, which are crucial for athletic performance and recovery [12]. While general nutrition knowledge can be learned through general health or physical education classes and school, topics specific to sports-related nutrition behaviors are often not addressed. Often times athletes look to their sport coaches as a main source of information, yet existing literature shows that coaches do not possess adequate nutrition-related knowledge [38]. Both adolescent athletes and their coaches would benefit from additional support in this area.

As a whole, adolescents, whether athletes or not, would benefit from programming that targets improving nutritional intake. However, merely educating adolescent athletes on the benefits of good nutrition practices cannot guarantee a change in behaviors. Many environmental factors can play a role in determining the types of foods and beverages an athlete may consume. Factors such as food availability at sporting events or in school cafeterias can play a role in food choices [39,40]. Many items available at concession stands or at fast food restaurants in proximity to sporting events do not serve many nutrient-dense food options which could result in lower nutrient-dense food consumption and higher sugary beverage consumption. Further, as adolescence is often associated with increased levels of autonomy, including autonomy related to food choices, it is important to help shape their attitudes and beliefs of healthy nutrition in order to help improve their diet choices [5]. Indeed, when considering efforts to improve diet-related behaviors, a more social ecological approach may result in better outcomes.

As there are many areas for improvement regarding general and sport-specific nutrition behaviors among adolescent athletes, the use of educational materials that target these areas could help both athletes and coaches alike. Adolescent athletes often prioritize physical training and skill development over proper nutrition, despite its critical role in performance and overall well-being. Given that sports participation significantly influences identity, self-esteem, and social belonging [41], it presents a valuable opportunity to reinforce healthy nutrition behaviors in a meaningful and

impactful way. The structured and supportive nature of sports teams fosters pro-social norms that extend beyond athletics [42], making them an ideal setting for targeted nutrition education. As adolescents gain independence, their dietary choices are increasingly shaped by social influences such as family, peers, and teammates [43]. Integrating structured nutrition education within the sports environment, such as through the PHP curriculum [25], could equip both athletes and coaches with the knowledge and tools necessary to improve dietary habits. Given the well-documented benefits of sports as a platform for personal development [44,45], leveraging this setting for nutrition education has the potential to foster lasting, health-promoting behaviors among adolescent athletes.

4.1. Limitations

There are several limitations to this study. First, the study includes a convenience sample of adolescent athletes from Michigan, Texas, and California and may not be generalizable to all adolescent athletes participating in youth sports. In contrast, it could be argued that using data from multiple states actually increases generalizability of the findings. Further, data collected were all self-reported behaviors which may not reflect actual dietary intake of the athletes. However, the current study utilized a dietary screener to assess dietary intake, and dietary screeners have been shown to align well with other forms of self-reported dietary intake instruments (i.e. food frequency questionnaires, 24-hour dietary recalls) that have been shown to have high validity [46,47]. Lastly, the study did not measure access to foods or food availability which may also impact the participant responses.

5. Conclusions

This study contributes to the expanding body of research on adolescent sports nutrition, identifying critical knowledge gaps that may influence both athletic performance and long-term health. While much of the existing literature has focused on elite athletes, our findings underscore the need for a more comprehensive examination of nutritional practices among non-elite youth athletes. Future research should investigate the effectiveness of various educational strategies, including school-based curricula, mentorship programs, and technology-driven interventions, to determine the most impactful approaches. Additionally, a deeper exploration of gender-specific differences in nutrition knowledge could inform more targeted and effective educational efforts. Providing young athletes with the necessary nutritional knowledge and resources is essential for fostering sustainable, health-promoting behaviors that extend beyond their athletic careers.

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