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Original Scientific Article

Assessing the Impact of Nutritional Knowledge and Information Sources on the Sports Performance of Elite Ethiopian Track Athletes: Insights for Optimized Sports Nutrition

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Abstract

Background. Proper nutrition is essential for maximizing athletic performance. Athletes with a high level of nutritional knowledge are more likely to adopt healthy dietary habits, positively impacting their performance. Understanding where athletes obtain nutritional information is crucial, as these sources influence dietary practices and performance.

Objectives. The study aimed to inform a culturally tailored nutritional strategy for Ethiopian athletes.

Materials and methods. A descriptive study was conducted with 301 randomly selected athletes from 10 sports clubs. Data on nutritional knowledge and information sources were gathered through validated questionnaires (Cronbach's alpha: 0.844 and 0.802, respectively). SPSS version 26 was used to analyze data via descriptive and inferential statistics, including correlation, regression, and ANOVA at a significance level of 0.05.

Results. The average scores for nutritional information sources and knowledge were 3.17 (SD = 1.19) and 3.09 (SD = 1.33), indicating moderate adherence. A strong correlation was found between information sources and performance ($R = 0.723$, $p < 0.001$), as well as a moderate correlation between nutritional knowledge and performance ($R = 0.629$, $p = 0.000$), explaining 79.2% of performance variance. Regression analysis showed that both factors had a significant effect on performance.

Conclusions. Nutritional knowledge and credible information sources are critical in enhancing athletes' performance. The study highlights the need for improved nutrition education among Ethiopian track athletes to promote better dietary practices and performance.

Keywords: athletes, nutritional information, nutritional knowledge, sports performance.

Introduction

Sports nutrition knowledge encompasses an understanding of nutritional factors that influence training, performance, and recovery, extending beyond general dietary knowledge. Unlike basic nutrition, which focuses on diet types and health, sports nutrition addresses the specific needs of high-performing athletes. Studies by Amawi & Alkasasbeh (2024) and Hasanpouri et al. (2023) indicate that higher nutrition knowledge correlates with better diet quality and that targeted education can improve athletes' dietary intakes (Bhawra et al., 2023; Klein et al., 2021).

For athletes, especially those in high-demand sports like track and field, nutritional knowledge (NK) is essential for sustaining health and boosting performance. Comprehensive NK equips athletes with the skills to make effective meal choices, directly impacting performance outcomes (Vázquez-Espino et al., 2022). Studies confirm that nutrition education can improve both dietary choices and energy availability, as shown by Debnath et al. (2023) in young athletes who, after an eight-week Nutrition Education Program, increased calorie, carbohydrate, and protein intake while reducing fast-food consumption (Werner et al., 2022).

Nutrition interventions by registered dietitians have also been effective in enhancing athletes' dietary choices and body composition (Amawi & Alkasasbeh, 2024). Although some research demonstrates measurable performance improvements following nutrition education, such as increased running speed (Akman et al., 2024), results may vary based on the intervention context and athlete characteristics. Supriya's (2013) study highlights the critical role of nutritional knowledge and reliable information sources in shaping athletes' dietary choices, directly impacting their performance. Athletes with strong nutritional understanding, particularly around

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macronutrient needs, hydration, and meal timing, are better positioned to support energy levels, recovery, and injury prevention. Access to accurate, science-based information from coaches, nutritionists, and credible sources promotes healthy dietary practices, while misinformation can hinder performance and increase fatigue risks. Positive attitudes toward nutrition further enhance adherence to beneficial habits, as proactive athletes seek and apply reliable guidance. Ultimately, the study suggests that structured nutrition education can foster improved dietary practices, leading to better performance outcomes and overall well-being.

Mola and Shaw (2024a) emphasize the need for managerial skills and nutrition in developing Ethiopian athletes, critiquing early specialization for its potential strains. They advocate adapting the Talent Development Environment Questionnaire for effective talent identification and underscore collaboration among sports organizations, nutritionists, and schools to provide culturally informed nutrition programs that support athletes' health and performance goals (Taye et al., 2024).

Despite their achievements in track and field, Ethiopian athletes often lack access to structured nutrition support. Studies show that athletes with higher NK make better dietary decisions, highlighting a gap in nutritional resources for Ethiopian athletes (Spronk et al., 2014). Addressing this gap with culturally relevant, science-based nutrition programs can enhance performance and serve as a model for other African countries. This study investigates the impact of nutritional knowledge, information sources, and cultural factors on the dietary practices and performance outcomes of elite Ethiopian track athletes. By examining these influences, the research aims to generate insights that inform policy and intervention frameworks, thereby supporting sustainable athletic excellence. The findings aim to inform a culturally tailored nutritional strategy for Ethiopian athletes.

Materials and Methods

Study Design and Participants

This descriptive study investigated the impact of nutritional knowledge, information sources, and athletic performance among Ethiopian track athletes. The researcher employed a standardized questionnaire developed by Rosenbloom et al. (2002) and Hasanpouri et al. (2023) to assess 301 athletes' knowledge of essential nutrition concepts – carbohydrates, proteins, fats, hydration, and micronutrients – and their perceived impact on performance. Additional items based on Hasanpouri et al. (2023) evaluated athletes' perceptions of the reliability of various nutrition information sources, including coaches, books, physicians, internet, magazines, and registered dietitians/nutritionists. Participants comprised junior and elite middle- and long-distance runners from 10 Ethiopian athletics academies, which are known for training future elite runners. Yamane's (1967) formula, with a 95% confidence interval and a 5% margin of error, determined the sample size. The final sample included 155 males (51.5%) and 146 females (48.5%) from various clubs: Sebeta Athletics Club (n = 30), Burayyu Club (n = 33), Laga Xafo Club (n = 35), Sululta Club (n = 31), Galan Club (n = 28), Dukam Club (n = 30), Holota Club (n = 17), Adama Club (n = 32), Asela Club (n = 30), and Oromia Construction Corporation (OCC) Club (n = 36). Middle- and long-distance runners who met health and physical preparedness criteria were eligible, requiring at least one year of training experience and no recent injuries. To maintain the integrity of the study, athletes participating in sprints, relay events, distances exceeding 21 km, and those with less than one year of training experience or recent injuries were excluded.

Procedure

The research utilized a descriptive survey method to examine the relationship between nutritional knowledge, sources of nutritional information, and sports performance among Ethiopian track athletes. This approach aimed to assess how these factors influence athletic performance, providing insights into the impact of both nutritional knowledge and the reliability of various information sources on athletes' outcomes. The survey employed a 28-item nutritional knowledge questionnaire and a 7-item nutritional information questionnaire, both designed for athletes, presented in a table format with a Likert scale ranging from 1 to 5. researcher systematically gathered responses from public athletic clubs in Ethiopia to gather essential data on nutritional knowledge and sources of nutritional information, to enhance athletes' performance.

Reliability and Validity of Instruments

An initial step involved evaluating the reliability and validity of each questionnaire item using Cronbach's Alpha to ensure the instrument's accuracy. The Cronbach's alpha values for the athletes' nutritional knowledge and sources of nutritional information were 0.844 and 0.802, respectively, indicating strong reliability The instrument underwent a thorough validation process to ensure its effectiveness. Based on feedback from the pilot study, revisions were made to clarify questionnaire items and enhance their validity, reliability, and linguistic precision. The refined version was then reviewed by professional and language experts to assess its alignment with the research objectives. A subsequent pilot study with a small group of athletes, like the main participants, will test the data collection methods, confirm participant understanding, and further refine the survey instrument, following best practices in research design (Mola and Shaw, 2024b).

Statistical Analysis

The study analyzed athletes' opinions and characteristics using SPSS version 26, employing robust statistical methods. Using a five-point scale, descriptive statistics such as frequency, percentages, mean, and standard deviation were used to summarize their opinions on various dimensions. These statistics provided insights into the prevalence of each opinion, the average response, and the variability of responses, highlighting overall sentiment and consistency. To investigate potential differences, inferential statistics were applied at a significant level of 0.05. Correlation and regression analyses were used to explore the relationships between nutritional knowledge, sources of information, and sports performance. Additionally, ANOVA was employed to evaluate the predictive power of the model on performance outcomes.

Results

Demographic characteristics of the respondents

The study included 312 middle-distance and long-distance athletes who participated in regional, national, and international competitions. However, only 301 of them completed and returned the questionnaire. According to the sample size table provided by Israel (2009), this number is within the acceptable range (301 ± 5 %).

Table 1. Socio-Demographic Information (n = 301)

Variable	Category	Frequency	%
Clubs name	Sebata	30	10.0
	Burayu	33	11.0
	Laga Tafo	35	11.6
	Sululta	31	10.3
	Galan	28	9.3
	Dukem	29	9.6
	Adama	32	10.6
	Holota	17	5.6
	OCC (Oromia Construction Corporation)	36	12.0
	Assela	30	10.0
	Total	301	100
Sex	Male	156	51.8
	Female	145	48.2
	Total	301	100
Age	under 18	148	49.2
	18-23	140	46.5
	24-29	13	4.3
	Total	301	100
Educational	Below high school	29	9.6
	high school	162	53.8
	Graduate	53	17.6
	College certificate & Diploma	47	15.6
	Degree	10	3.3
	Total	301	100
Marital status	Single	297	98.7
	Married	2	0.7
	Divorced	2	0.7
	Total	301	100
Monthly income	1000-2000 birr	95	31.6
	2000-4000 birr	125	41.5
	Greater than 4000 birrs	81	26.9
	Total	301	100

In terms of gender representation, 156 (51.8 %) of the survey participants were male, and 145 (48.0 %) were female. The gender distribution of the research sample participants is nearly equal. We asked athletes about their age and clustered the data into 4 categories, as shown in the above table. 148(49.2 %) of the respondents were under 18 years, 140(46.5 %) of the respondents were between 18 and 23 years, and 13(4.5 %) of the respondents were between 24-29 years. The educational background of the athletes who responded is a topic of interest. 29(9.6 %) of athletes are in primary education, 162(53.8 %) of athlete's respondents are high school students, 53(17.6) athletes are graduate class, 47(15.6) of the athletes were college diploma and college certified, and 10(3.3 %) of the athletes were degree holders. Athletes were asked about marital status. Of the athletes, 297 (98.7) were single, 2 (0.7) married, and 2 (0.7) divorced. 95 (41.55) of the athletes earn between 2000 and 4000 birr per month, 95 (31.6 %) earn between 1000 and 2000 birr per month, and the remaining 81 (26.1 %) earn 4000 birr per month.

Table 2. Sports Profile of Athletes

N	Variable	Category	Frequency	%
1	Athletic Events	middle distance	190	63.1
		long distance	111	36.9
		Total	301	100
2	Races	800m	39	13.0
		1500 m	53	17.6
		3000 m steeplechase	44	14.6
		3000 m	55	18.3
		5000 m	54	17.9
		10000 m	56	18.6
		Total	301	100
3	Years Spent in the Club Since Joining	6 months -1 year	66	21.9
		1- 2 year	93	30.9
		2- 3 year	22	7.3
		3-4-year	70	23.3
		Above 5 years	50	16.6
		Total	301	100
4	Training Frequency (Train per Week)	Every day	55	18.3
		3 days per weak	105	34.9
		4 days per week	26	8.6
		5 days per week	67	22.3
		Total	301	100
5	Time of practice (training time)	only morning	126	41.9
		only afternoon	144	47.8
		both morning and afternoon	31	10.3
		Total	301	100
6	Hours of train per day	30 minutes - 1 hour	58	19.3
		1hours -1:30 hours	95	31.6
		1:30-2 hours	83	27.6
		above 2 hours	65	21.6
		Total	301	100
7	Frequency of athlete competition per year	once a year	93	30.9
		twice a year	150	49.8
		thrice a year	58	19.3
		Total	301	100
8	Level of competition	International level	70	23.3
		National level	122	40.5
		Regional level	109	36.2
		Total	301	100

Table 2 reveals that most athletes, 190 (63.1 %), participate in middle-distance events, while a notable portion, 111 (36.1 %), participate in long-distance events. When we delve deeper into the specific race categories, we find that

the distribution shows varying levels of participation. Notably, we categorized 39 athletes (13.0 %) under the 800m race, 53 athletes (17.6 %) under the 1500 m race, 44 athletes (14.6 %) under the 3000m steeplechase, 55 athletes (18.3 %) under the 3000 m race, 54 athletes (17.9 %) under the 5000 m race, and 56 athletes (18.6 %) under the 10000 m race. These figures highlight the versatility and specialization of middle distance in the 3000 m race and l0000 m long-distance competitors. Notably, 66 (21.9 %) for 6 months to 1 year, 93 (30.9 %) of athletes have been members for 1-2 years, 22 (7.3 %) for 2-3 years, 70 (23.3 %) for 3-4 years, and 50 (16 %) above 5 years. Examining the training frequency per week, most athletes train three days a week: 105 (34.9 %), followed by those who train five days a week: 67 (22.3 %), every day: 55 (18.3 %), and four days a week: 26 (8.6 %). The practice time reveals that 126 (41.9 %) of athletes prefer training only in the morning, 144 (47.8 %) do afternoon sessions, and 31 (10.3 %) engage in both morning and afternoon training. When considering the hours of training per day, most athletes 95 (31.6 %) train for 1 to 1:30 hours, followed by 83 (27.5 %) for 1:30 to 2 hours, 58 (19.3 %) for 30 minutes to 1 hour, and 65 (21.6 %) for above 2 hours. Regarding competition frequency per year, 150 (49.8 %) of athletes compete twice a year, 93 (30.9 %) compete once a year, and 58 (19.3 %) compete thrice a year. Finally, the level of competition showcases diversity.

Table 3. Means and Standard Deviations of Athletes' Source of Nutritional Information

N B	Athletes' Source of Nutritional Information	Mean	SD
1	The nutritional information I get from the coach is accurate.	3.50	1.15
2	The nutritional information I get from the book is reliable.	3.33	1.24
3	The nutritional information I get from physicians is accurate.	3.07	1.14
4	The nutritional information I get from the internet is reliable.	3.29	1.18
5	The Nutritional Information I get from magazines is reliable.	3.22	1.12
6	I regularly incorporate dairy products such as milk, yoghurt, or cheese into my diet.	2.58	1.32
7	The nutritional information I get from a registered dietitian/ nutritionist is reliable	2.58	1.32
	Overall	3.17	1.19

The findings reveal that athletes showed moderate agreement on the accuracy of nutritional information from coaches, with a mean score of 3.50 and a standard deviation

Table 4. Means and Standard Deviations of Athletes' Nutritional Knowledge

N B	Athletes' Nutritional knowledge	Mean	SD
1	Skipping breakfast can negatively affect athletic performance.	3.08	1.27
2	Carbohydrates are the primary energy source for the body during exercise, enhancing sports performance.	3.12	1.41
3	Carbohydrates and proteins provide approximately 4 kcal per gram for fueling endurance exercise.	3.64	1.19
4	High-quality protein sources for athletes include lean meats, fish, eggs, dairy, and plant-based options.	3.14	1.38
5	Athletes require a higher protein intake than sedentary individuals to support muscle repair and growth.	3.01	1.29
6	Plant-based proteins are equally effective as animal-based proteins for muscle repair and growth.	3.70	1.12
7	Protein serves as the main energy source used by muscles during high-intensity exercise.	2.90	1.54
8	Fat intake should be minimized in an athlete's diet to optimize performance	3.00	1.31
9	Athletes should focus on consuming fats high in omega-6 fatty acids for optimal performance	3.69	1.194
10	Foods such as whole grains, fruits, vegetables, and legumes, which typically have a lower glycemic index, for better blood sugar control and sustained energy	3.10	1.166
11	Vitamins A, C, and E act as antioxidants to support overall health and immune function.	3.06	1.402
12	Vitamin D and K are primarily aided in calcium absorption, crucial for bone health.	3.77	1.070
13	Calcium deficiency can lead to stress fractures, highlighting its importance for athletes.	3.20	1.349
14	Iron deficiency can result in fatigue, injury, and illness, particularly concerning for female athletes.	3.35	1.510
15	Cheese is a good dietary source of iron, vital for energy production and performance.	2.67	1.156
16	Carrots are rich in vitamin A, essential for vision and immune function.	2.83	1.576
17	Minerals play a significant role in energy production and overall health.	3.07	1.188
18	Vitamin supplements, like Vitamin C, can help prevent upper respiratory tract infections, supporting athlete well-being.	3.48	1.165
19	During the activity, thirst is an adequate indicator of the need for fluids.	2.74	1.433
20	Athletes should consume fluids before, during, and after exercise to maintain hydration.	2.38	1.316
21	Electrolyte replacement drinks are necessary for all athletes during prolonged exercise.	2.62	1.250
22	Caffeine consumption can lead to dehydration and should be limited during exercise	2.96	1.365
23	Sodium drinks enhance fluid retention, optimizing hydration for endurance performance.	2.86	1.587
24	Endurance athletes may require daily protein drinks during the competition season.	3.41	1.519
25	Creatine supplementation, multivitamins, and iron tablets are the most effective in improving endurance.	2.98	1.210
26	Caffeine supplementation can lead to a decreased perception of effort during exercise.	3.56	1.440
27	Consumption of sodium bicarbonate can delay the onset of muscle fatigue.	3.32	1.460
28	Vitamins A, C, and E act as antioxidants to support overall health and immune function.	3.46	1.379
	Overall	3.09	1.33

SD of 1.15. The reliability of information from books received a mean score of 3.33 and an SD of 1.24, indicating a similar moderate agreement. Physicians' information received a mean rating of 3.07 and an SD of 1.14, indicating moderate accuracy. Nutritional information from the internet was considered moderately reliable, with a mean score of 3.29 and an SD of 1.18. Similarly, the reliability of information from magazines had a mean score of 3.22 and an SD of 1.12. However, information from registered dietitians/nutritionists received a lower mean score of 2.58 and an SD of 1.32, indicating less agreement among athletes about its reliability. Additionally, athletes' regular incorporation of dairy products into their diet had a mean of 2.58 and an SD of 1.32, showing variability in dietary habits. Overall, the average mean across all parameters was 3.17, with an overall SD of 1.19, suggesting a moderate level of agreement regarding the reliability of various sources of nutritional information.

The data reveals that Ethiopian athletes generally display moderate to strong agreement on various nutritional concepts. For example, athletes showed moderate agreement on the negative impact of skipping breakfast on performance (mean = 3.08, SD = 1.27) and carbohydrates as the primary energy source (mean = 3.12, SD = 1.41). There was stronger consensus on the caloric content of carbohydrates and proteins (4 kcal per gram) (mean = 3.64, SD = 1.19) and the effectiveness of plant-based proteins compared to animal-based ones for muscle growth (mean = 3.70, SD = 1.12). Athletes agreed moderately on the benefits of quality protein sources like lean meats, dairy, and eggs (mean = 3.14, SD = 1.38) and protein's role in muscle repair (mean = 3.01, SD = 1.29), but held a neutral stance on protein as the main energy source during high-intensity exercise (mean = 2.90, SD = 1.54). Similarly, there was moderate agreement on the significance of omega-6 fats (mean = 3.69, SD = 1.19) and the benefits of low-glycemic foods for sustained energy (mean = 3.10, SD = 1.17). There was a strong consensus on vitamins D and K's role in bone health (mean = 3.77, SD = 1.07), iron's importance for female athletes (mean = 3.35, SD = 1.51), and the preventive role of vitamin C against respiratory infections (mean = 3.48, standard deviation = 1.16). We recorded neutral responses for thirst as an indicator of fluid needs (mean = 2.74, SD = 1.43), the role of caffeine in dehydration (mean = 2.96, SD = 1.37), and the benefits of electrolyte drinks during prolonged exercise (mean = 2.62, SD = 1.25). Athletes also mostly agreed that sodium bicarbonate could help reduce muscle fatigue (mean = 3.32, SD = 1.46), that caffeine supplements could help lower perceived exertion (mean = 3.56, SD = 1.44), and that daily protein drinks during the season could be helpful (mean = 3.41, SD = 1.52). In summary, athletes demonstrated varying levels of understanding across these nutritional parameters, emphasizing the need for continued education to enhance nutritional practices and optimize performance outcomes.

The survey results reveal significant correlations between several key factors and the enhancement of an athlete's sports performance. Firstly, there exists a strong positive correlation between athletes' source of nutritional information and their performance outcomes ($R = 0.723$, $p < 0.001$). These figures indicate a significant positive correlation between athletes' nutritional knowledge and its impact on enhancing their sports performance, with a significance level of 0.05. Furthermore, the nutritional knowledge of athletes also demonstrates a moderately positive correlation with sports performance enhancement ($R = 0.629$, $p = 0.000$). Multiple studies support this correlation, highlighting the importance of proper nutrition for optimal athletic performance. Athletes who have better nutritional knowledge tend to make more informed dietary choices, optimize their dietary intakes, and perform better in their respective sports.

As the above table depicts, the adjusted R2 Value of the model is 0.792, indicating that 79.2 % of the variation in athlete sports performance enhancement is explained by the

Table 5. The correlation between athletes' sources of nutritional information, their nutritional knowledge, and Athlete Sports Performance

Correlations				
		SNIO	NNA	ASPEN
SNIO	Pearson Correlation	1		
	Sig. (2-tailed)			
	n	301		
NNA	Pearson Correlation	.684*	1	
	Sig. (2-tailed)	.001		
	n	301	301	
ASPEN	Pearson Correlation	.723*	.629*	1
	Sig. (2-tailed)	.001	.000	
	n	301	301	301

**. Correlation is significant at the 0.05 level (2-tailed).

SNI: Source of Nutritional Information, NNA: Nutritional Knowledge, ASPE: Athlete Sports Performance Enhancement

Table 6. Effects of source of nutritional information, nutrition Knowledge on athlete's sports performance enhancement

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.792a	.513	.658	.90064

a. Predictors: (Constant), NNA, SNIO

b. Dependent Variable: ASPEN

SNI: Source of Nutritional Information, NNA: Nutritional Knowledge, ASPE: Athlete Sports Performance Enhancement

Table 7. ANOVA of Effect on Athlete Sports Performance Enhancement

ANOVA[a]						
	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.079	2	1.539	1.898	.000b
	Residual	241.723	298	.811		
	Total	244.801	300			

a. Dependent Variable: ASPEN

b. Predictors: (Constant), NNA, SNIO

SNI: Source of Nutritional Information, NNA: Nutritional Knowledge, ASPE: Athlete Sports Performance Enhancement.

Table 8. Regression Coefficient

Coefficients[a]									
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0 % Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
(Constant)	4.137	.381		10.855	.000	3.387	4.887		
SNIO	.196	.086	.165	1.114	.000	-.265	.073	.916	1.035
NNA	.164	.120	.180	1.366	.013	-.399	.069	.866	1.029

a. Dependent Variable: ASPEN

SNI: Source of Nutritional Information, NNA: Nutritional Knowledge, ASPE: Athlete Sports Performance Enhancement

source of nutritional information and nutritional knowledge. In other words, 19.8 % of the variation in athlete sports performance enhancement cannot be explained by the study variables, and other factors can influence athlete sports performance enhancement.

The F-ratio in the ANOVA in the above table tests whether the overall regression model is a good fit for the data. The table shows that the independent variables statistically significantly predict the dependent variable, $F_{(2, 298)} = 1.898$, $p < .005$(i.e., the regression model is a good fit for the data).

The values of the unstandardized beta coefficients (β) indicate the effects of each independent variable on the dependent variables. Furthermore, when all other independent variables in the models control the variance, the value of the unstandardized beta coefficients in the beta column of the above table indicates which independent variable (source of nutritional information and nutritional knowledge) makes the strongest contribution to explaining the dependent variable (effect on athlete sports performance enhancement). The t value and the sig (p) value indicate whether the independent variable is significantly contributing to the prediction of the dependent variable. The regression analysis revealed that the source of nutritional information and nutritional knowledge significantly influences the enhancement of an athlete's sports performance, with coefficients of 0.165 and 0.180, respectively. After processing multiple regressions, the following regression model was produced: Overall effect on athlete sports performance enhancement =.381 + 0.165 (source of nutritional information) + 0.180 (nutritional knowledge) +e

Y=0.381+0.165X1+0.180X2 +e
Where Y = effect on athlete sports performance enhancement
X1 = Source of nutritional knowledge.
X2=Nutritional knowledge
e = Sampling error

Discussion

This study aimed to investigate the influence of nutritional information sources and nutritional knowledge on the sports performance enhancement of Ethiopian track event athletes. The analysis encompassed 301 athletes from a population of 1,220, focusing on middle-distance and long-distance runners. The demographic analysis revealed a relatively balanced gender distribution (51.8 % male and 48.2 % female), a predominance of younger athletes (49.2 % under 18 years), and a significant proportion still in high school (53.8 %). Despite the prevalent high school education level among participants, this did not significantly affect their nutritional knowledge or dietary practices. The sports profile indicated that most athletes (63.1 %) engaged in middle-distance events, trained approximately three times per week (34.9 %), and competed primarily twice a year (49.8 %). Participation occurred at various competitive levels, including national (40.5 %) and international (23.3 %). However, the data revealed that many of the respondents were in high school education, leading the researcher to assume that they might share significant ideas about nutritional knowledge, dietary intake practice, and attitude investigation. Therefore, according to Spronk et al. (2014), the level of education had no significant influence on team or individual diversion regarding nutritional knowledge, dietary intake practice, and attitude toward enhancing performance.

The study evaluated athletes' perceptions of the accuracy and reliability of various nutritional information sources. The average responses revealed a moderate level of agreement regarding the reliability of these sources. Coaches' information received a mean reliability score of 3.50, whereas books and the internet received ratings of 3.33 and 3.29, respectively. Conversely, athletes rated information from registered dietitians/nutritionists lower (mean = 2.58), indicating a lack of trust. The literature supports these findings. For example, Trakman et al. (2016) found that people often view coaches as reliable sources of nutritional information. Similarly, Torres-McGehee et al. (2012) noted that while athletes trust books and Internet sources, there remains a significant reliance on personal recommendations from coaches and physicians.

A recent study highlights the challenges faced by registered dietitians and nutritionists in building trust with athletes, often leading to decreased reliability ratings for these professionals. For instance, a study evaluating NCAA Division III collegiate athletes revealed that, despite the recognition of registered dietitians' expertise, athletes primarily relied on coaches and social media for nutrition advice, highlighting a significant trust and accessibility gap (Klein et al., 2021). Moreover, studies investigating the nutritional acumen of elite athletes indicated that many individuals had inadequate comprehension of their dietary requirements, resulting in reliance on less reputable sources rather than consulting competent nutrition experts (Hasanpouri et al., 2023).

The athletes' nutritional knowledge assessment revealed moderate agreement on several key dietary concepts. Athletes demonstrated a moderate understanding of the impact of breakfast on performance (mean = 3.08), the role of carbohydrates as an energy source (mean = 3.12), and the caloric content of macronutrients (mean = 3.64). Knowledge about high-quality protein sources (mean = 3.14) and the necessity

for increased protein intake (mean = 3.01) was also moderate. However, there was a more neutral stance on the role of protein in high-intensity exercise (mean = 2.90) and the necessity of electrolyte replacement (mean = 2.62). These results align with the literature, which indicates a varied level of nutritional knowledge among athletes. For instance, Alahmadi and Albassam (2023) reported that athletes generally possess limited nutritional understanding, particularly regarding energy density and micronutrients. Conversely, Thomas et al. (2016) emphasized that a strong understanding of nutrition allows athletes to optimize their dietary intake, which enhances performance.

The study's regression analysis revealed a strong positive correlation between sources of nutritional information and sports performance enhancement ($R = 0.723$, $p < 0.001$). This supports Heaney et al. (2011) who found that athletes with comprehensive nutritional information make better dietary choices, leading to improved performance. Additionally, there is a moderate positive correlation between nutritional knowledge and sports performance enhancement ($R = 0.629$, $p = 0.000$), corroborating Akçay et al. (2023) and emphasizing the critical role of nutritional knowledge in enhancing athletic performance. The regression analysis's adjusted R^2 value of 0.792 shows that the sources of nutritional information and knowledge account for 79.2 % of the variation in sports performance enhancement. This aligns with existing research, which emphasizes the critical role of nutritional information and knowledge in athletic performance. For instance, Heaney et al. (2011) conducted a systematic review and found that athletes with comprehensive nutritional information are more likely to make informed dietary choices, which directly enhance their performance. Similarly, Martín-Rodríguez et al. (2024) noted that well-informed athletes tend to optimize their dietary intakes, leading to significant improvements in their physical capabilities.

The ANOVA results ($F_{(2, 298)} = 1.898$, $p < 0.005$) confirm the regression model's validity, indicating that the sources of nutritional information and nutritional knowledge are significant predictors of sports performance enhancement. This finding is consistent with the conclusions of Thomas (2016), who emphasized that athletes with a strong understanding of nutrition can tailor their diets to optimize energy intake, recovery, and overall performance. The regression analysis also revealed that both sources of nutritional information and nutritional knowledge significantly affect sports performance enhancement, with β coefficients of 0.165 and 0.180, respectively. This indicates that while both factors are important, nutritional knowledge has a slightly stronger impact on performance enhancement. Recent literature supports the assertion that both sources of nutritional information and nutritional knowledge significantly influence sports performance enhancement (Taye et al., 2024; Reza et al., 2024). It indicates that athletes with higher levels of nutritional knowledge (NK) demonstrate better dietary habits, which are crucial for enhancing athletic performance.

The research established a positive correlation between NK and dietary practices, such as increased intake of fruits and vegetables and reduced consumption of unhealthy fats. This suggests that athletes who are better informed about nutrition can make healthier food choices that enhance their performance (Jagim et al., 2021; Vázquez-Espino et al., 2022). Mola and Shaw's (2024c) validated talent identification questionnaire enhances athlete evaluation and development, emphasizing the importance of integrating effective nutritional practices to optimize performance. The credibility and type of nutritional information sources also play a critical role. Athletes often report feeling overwhelmed by the abundance of dietary recommendations, which can lead to confusion about which advice to follow. This "information overload" can negatively impact their ability to apply nutritional knowledge effectively (Kiss et al., 2021). Conversely, athletes' understanding and application of nutritional strategies improve with well-structured educational programs that provide clear, evidence-based nutrition guidance, thereby enhancing performance outcomes (Larson-Meyer et al., 2018; Kiss et al., 2021). Research indicates that adequate nutrition is essential for optimizing physical performance and reducing injury risks among athletes. For instance, a study on collegiate athletes found significant correlations between dietary intake (including macronutrients) and performance metrics like VO_2max, underscoring the importance of both knowledge and proper information sources in achieving optimal performance levels (Riviere et al., 2021; Hariyanto et al., 2022).

Conclusion

This study investigated the impact of nutritional information sources and nutritional knowledge on the sports performance of Ethiopian track event athletes. The findings revealed that athletes predominantly rely on moderately reliable sources for their nutritional information, including coaches, books, physicians, and the internet, while exhibiting lower trust in registered dietitians and nutritionists. The study also highlighted that athletes possess a varied level of nutritional knowledge, with stronger agreement on certain concepts, such as the importance of carbohydrates and vitamins for performance, but more neutral or less informed stances on other areas, such as the role of protein during high-intensity exercise and the effectiveness of supplements. The results indicated a significant positive correlation between both the source of nutritional information and athletes' nutritional knowledge with sports performance enhancement. Specifically, athletes who were well-informed and relied on accurate sources of nutritional information tended to achieve better performance outcomes. The data also indicated that these factors could explain approximately 79.2 % of the variation in sports performance enhancement, underscoring their significance.

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Conflicts of Interest

The authors declare no conflicts of interest.

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Оцінка впливу обізнаності щодо принципів режиму харчування та інформаційних джерел на показники спортивної результативності елітних ефіопських легкоатлетів-бігунів: Розуміння аспектів оптимізованого спортивного харчування

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Авторський вклад: A – дизайн дослідження; B – збір даних; C – статаналіз; D – підготовка рукопису; E – збір коштів

Реферат. Стаття: 9 с., 7 табл., 29 джерел.

Історія питання. Правильне харчування має важливе значення для забезпечення максимізації спортивної результативності. Спортсмени з високим рівнем обізнаності щодо принципів режиму харчування частіше дотримуються здорових харчових звичок, що позитивно впливає на їхні показники результативності. Розуміння шляхів отримання спортсменами інформації щодо харчування має вирішальне значення, оскільки ці джерела впливають на дієтичні практики та результативність.

Мета дослідження. Метою дослідження було надання інформації щодо стратегії харчування ефіопських спортсменів з урахуванням культурних особливостей.

Матеріали та методи. Проведено описове дослідження за участю 301 спортсменів, відібраних за методом рандомізації із 10 спортивних клубів. Збір даних щодо рівня обізнаності з питань харчування та джерел інформації здійснено за допомогою валідованих опитувальників (коефіцієнт альфа Кронбаха: 0,844 та 0,802 відповідно). Для аналізу даних використовували програмне забезпечення SPSS версії 26 за допомогою описової та інференційної статистик, включаючи кореляцію, регресію та дисперсійний аналіз (ANOVA) на рівні значущості 0,05.

Результати. Середні бали оцінки джерел інформації та обізнаності щодо аспектів харчування становили 3,17 (SD = 1,19) та 3,09 (SD = 1,33), що вказує на помірний рівень дотримання режиму харчування. Встановлено міцний кореляційний зв'язок між джерелами інформації та результативністю ($R = 0{,}723$, $p < 0{,}001$), а також помірний кореляційний зв'язок між рівнем поінформованості щодо режиму харчування та результативністю ($R = 0{,}629$, $p = 0{,}000$), що пояснює рівень дисперсії зі значенням 79,2% результативних даних. Регресійний аналіз продемонстрував, що обидва фактори мали значний вплив на показники результативності.

Висновки. Рівень обізнаності щодо режиму харчування та достовірні джерела інформації є критично важливими для підвищення результативності спортсменів. Дослідження підкреслює необхідність покращення рівня освіченості з питань харчування серед ефіопських легкоатлетів-бігунів з метою сприяння оптимізації дієтичних практик та показників результативності.

Ключові слова: спортсмени, інформація щодо харчування, обізнаність щодо харчування, спортивна результативність.

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