

Investigation of the level of nutritional knowledge of amateur athletes and their attitudes and beliefs toward nutritional supplements

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Abstract:

This study aimed to examine whether nutritional knowledge predicts supplement-related beliefs among amateur athletes. A total of 404 volunteer amateur athletes participated in this relational survey study. Data were collected using a personal information form, the Nutrition Knowledge Scale, and the Sports Supplements Belief Scale. Descriptive statistics, independent samples t-tests, Pearson correlation analysis, and linear regression analysis were performed. The results indicated that women had significantly higher nutritional knowledge scores than men ($p < .001$, $d \approx 0.39$), whereas supplement-related belief scores did not differ by gender ($p > .05$, $d \approx 0.08$). Nutritional knowledge and supplement-related beliefs were positively and weakly correlated ($r = .151$, $p = .002$). Regression analysis showed that nutritional knowledge significantly predicted supplement-related beliefs; however, the explained variance was low ($R^2 = .023$, adjusted $R^2 = .021$). These findings suggest that higher nutritional knowledge may be associated with stronger beliefs regarding the perceived benefits of sports supplements, although additional factors are likely to play a greater role in shaping athletes' supplement-related beliefs and decisions.

Keywords: amateur athletes, nutrition knowledge, nutritional supplements, ergogenic aids

Introduction

Achieving success in sport is a strong motivator for individuals participating in both amateur and elite-level competitions. In addition to regular training, athletic performance is influenced by multiple factors, including appropriate training periodization, sufficient recovery, and an adequate and balanced nutrition plan. In this context, athletes frequently seek strategies that may support performance and facilitate adaptation to training, including the use of ergogenic aids and nutritional supplements (Koçyiğit et al., 2011; Öztürk et al., 2020). However, it is essential to emphasize that sustainable performance improvement is primarily supported by well-established nutritional habits and evidence-based dietary practices rather than reliance on supplements alone (Mercan, 2021).

Nutrition is commonly defined as the adequate and balanced intake of nutrients required to maintain health and support physiological functioning (Ayas & Göral, 2023; Baysal, 2015). For athletes, a balanced diet plays a critical role in maintaining health, meeting energy demands, and supporting recovery processes. It has been emphasized that appropriate macronutrient distribution, including carbohydrates, proteins, and fats, contributes to energy availability before, during, and after training and competition (Helms et al., 2014). Moreover, dietary diversity is necessary because no single food or food group can meet all nutrient needs sufficiently (Lanham-New et al., 2011). Therefore, when used appropriately and in combination with a balanced diet, some ergogenic aids or nutritional supplements may support training quality and performance outcomes.

The use of ergogenic aids has a long history in sport, ranging from traditional practices aimed at enhancing strength and endurance to modern applications supported by developments in nutrition science and technology (Sumida et al., 1989). While certain supplements may provide additional energy sources (e.g., glucose) or support metabolic pathways related to energy production (Bouchard et al., 1994), inappropriate or uninformed use may lead to adverse health outcomes. Previous research has highlighted potential risks associated with long-term and unsupervised supplement use, including negative physiological and psychological consequences (Gençtürk et al., 2009). For this reason, athletes' knowledge about nutrition and their beliefs regarding supplementation may influence not only performance-related behaviors but also long-term health.

Sports nutrition is widely recognized as a key determinant of athletic performance, particularly among elite athletes (Ersoy, 2011; Tan, 2024; Yalcinkaya et al., 2024). However, nutritional knowledge may be equally important for amateur athletes, as it can shape dietary behaviors and influence decisions related to supplement use. Despite the widespread availability of supplements and the growing interest in performance enhancement strategies, amateur athletes may not always have sufficient knowledge to make informed decisions. Moreover, beliefs regarding the necessity and benefits of supplements may develop independently of objective nutritional knowledge, potentially increasing the likelihood of unnecessary or inappropriate supplement use.

Although nutritional knowledge and supplement-related beliefs represent important factors in athletes' decision-making, research examining the relationship between these variables remains limited (Cash et al., 2004; Kortay, 2021). Therefore, addressing this gap, the present study aimed to examine nutritional knowledge levels and supplement-related beliefs among amateur athletes and to investigate whether nutritional knowledge predicts supplement-related beliefs. In addition, differences in nutritional knowledge and supplement-related beliefs were examined across selected demographic variables.

Materials and Methods

Research Model

This study employed a quantitative research design to examine amateur athletes' nutritional knowledge levels and their beliefs regarding sports nutrition supplements. A relational survey model was used to investigate the associations between two or more variables (Büyüköztürk et al., 2019).

Research Group

A total of 404 volunteer amateur athletes participated in the study. As presented in Table 1, 58.7% of the participants were male and 41.3% were female. Regarding adequate and balanced nutrition, 63.4% reported "yes" and 36.6% reported "no". Additionally, 30.4% reported previous use of nutritional supplements, whereas 69.6% reported no prior use. Approximately half of the participants (50.5%) reported knowing how to use nutritional supplements, while 49.5% reported not knowing. The mean age of the participants was 23.49 ± 8.25 years, and the mean number of meals consumed per day was 2.76 ± 0.70 .

Table 1. Descriptive statistical results of the participants

Variables	Group	f	%
Gender	Male	237	58.7
	Female	167	41.3
Adequate and balanced nutrition	Yes	256	63.4
	No	148	36.6
Previous use of nutritional supplements	Yes	123	30.4
	No	281	69.6
Knowledge of how to use nutritional supplements	Yes	204	50.5
	No	200	49.5
	$\bar{X}$		S.D.
Age		23.49	8.25
Number of meals consumed in a day		2.76	.70

Notes. $\bar{X}$: mean; S.D.: standard deviation

Data Collection

Data were collected in 2024 using an online survey administered via Google Forms. The survey consisted of a Personal Information Form, the Nutrition Knowledge Scale, and the Sports Supplements Belief Scale. Before participation, individuals were informed about the purpose of the study and voluntary participation was emphasized. Only responses from volunteer amateur athletes were included in the analyses.

Data Collection Tools

Personal Information Form

The Personal Information Form was developed by the researchers and included items on age, gender, adequate and balanced nutrition status, previous use of nutritional supplements, knowledge about how to use nutritional supplements, and the number of meals consumed daily.

Nutrition Knowledge Scale

The Nutrition Knowledge Scale, developed by Öngün Yılmaz et al. (2021), was used to measure individuals' nutrition-related knowledge. The scale includes items addressing food and nutrient knowledge, food preparation and cooking methods, and the relationship between nutrition and health. Responses are rated on a 5-

point scale ranging from “Strongly Disagree” (0 points) to “Strongly Agree” (4 points). The scale contains 10 reverse-scored items (Items 1, 5, 6, 9, 10, 16, 17, 21, 27, 28). Higher total scores indicate higher nutritional knowledge, whereas lower scores indicate inadequate knowledge. In the original study, construct validity was supported (KMO = .86; Bartlett’s Test of Sphericity = 3869.244, $p < .001$), and the internal consistency coefficient was reported as $\alpha = .85$. In the present study, Cronbach’s alpha was .84, indicating high reliability.

Sports Supplements Belief Scale

The Sports Supplements Belief Scale was developed by Hurst et al. (2017) and adapted into Turkish by Karafil et al. (2021). The scale aims to assess individuals’ beliefs regarding sports nutrition supplements. It consists of six items rated on a 6-point Likert scale ranging from “Strongly Disagree” (1 point) to “Strongly Agree” (6 points), with no reverse-scored items. Higher total scores indicate stronger beliefs toward the perceived benefits/necessity of sports supplements. In the Turkish adaptation study, the scale demonstrated a single-factor structure and high internal consistency ($\alpha = .91$), explaining 69.379% of the total variance. In the present study, Cronbach’s alpha was .86, indicating high internal consistency (Karagöz, 2017).

Data Analysis

Data were analyzed using SPSS version 25. Skewness and kurtosis values were examined to evaluate normality. Values within ± 2 were considered indicative of approximately normal distribution (George & Mallery, 2024). Frequency and percentage distributions were calculated for categorical variables and mean $\pm$ standard deviation values were reported for continuous variables. Independent samples t-tests were conducted to examine whether nutritional knowledge and sports supplement belief scores differed according to gender, adequate and balanced nutrition status, previous use of nutritional supplements, and knowledge of how to use nutritional supplements. Pearson correlation analysis was performed to examine relationships among nutritional knowledge, sports supplement beliefs, age, and the number of meals consumed per day. Finally, linear regression analysis was conducted to determine whether nutritional knowledge predicted sports supplement belief scores. Statistical significance was set at $p < .05$ for all analyses.

Results

Table 2. Comparison results of participants' nutritional knowledge and beliefs about sports nutrition supplements

Variables	Gender	N	$\bar{X}$	S.D.	t	p	Cohen's d
Nutritional Knowledge Scale	Male	237	108.99	12.36	-3.901	< .001*	0.39
	Female	167	114.10	13.77			
Sports Supplements Belief Scale	Male	237	19.78	5.31	-.809	.419	0.08
	Female	167	20.20	4.66			
Adequate and Balanced Nutrition							
Nutritional Knowledge Scale	Yes	256	111.93	13.31	1.661	.097	0.17
	No	148	109.67	12.89			
Sports Supplements Belief Scale	Yes	256	20.01	5.21	.274	.784	0.03
	No	148	19.86	4.78			
Previous Use of Nutritional Supplements							
Nutritional Knowledge Scale	Yes	123	111.50	15.25	.367	.714	0.04
	No	281	110.93	12.20			
Sports Supplements Belief Scale	Yes	123	21.17	5.24	3.237	.001*	0.35
	No	281	19.42	4.88			
Knowledge of How to Use Nutritional Supplements							
Nutritional Knowledge Scale	Yes	204	111.21	13.94	0.164	.870	0.02
	No	200	110.99	12.40			
Sports Supplements Belief Scale	Yes	204	20.28	5.21	1.323	.187	0.13
	No	200	19.62	4.87			

Notes. $\bar{x}$: mean; S.D.: standard deviation; t: t-test value; d: Cohen’s effect size; * $p < .05$.

Independent samples t-test results were presented in Table 2. Nutritional knowledge scores significantly differed by gender, with females scoring higher than males ($t = -3.90$, $p < .001$, $d \approx 0.39$). In contrast, sports supplements belief scores did not significantly differ by gender ($t = -0.81$, $p = .419$, $d \approx 0.08$). No significant differences were observed in nutritional knowledge or sports supplements belief scores according to participants’ adequate and balanced nutrition status ($p > .05$). Similarly, knowledge of how to use nutritional supplements was not associated with significant differences in either nutritional knowledge or sports supplement belief scores ($p > .05$). Regarding previous use of nutritional supplements, sports supplements belief scores were significantly higher among participants who reported prior supplement use compared to those who did not ($t = 3.24$, $p = .001$), whereas nutritional knowledge did not differ between these groups ($p = .714$).

Table 3. Correlations of nutritional knowledge and sports supplements beliefs with age and number of meals

Variables		Nutritional Knowledge	Sports Belief	Supplements
Age	r	.185**	-.185**	
	p	< .001	< .001	
Number of Meals Consumed Daily	r	-.010	.052	
	p	.845	.301	

Notes. r: Pearson correlation coefficient; **p < .01.

Pearson correlation results were presented in Tables 3 and 4. Age was positively and weakly correlated with nutritional knowledge ($r = .185$, $p < .001$) and negatively and weakly correlated with sports supplement belief scores ($r = -.185$, $p < .001$). No significant correlations were found between the number of meals consumed per day and nutritional knowledge ($r = -.010$, $p = .845$) or sports supplements belief scores ($r = .052$, $p = .301$). In addition, nutritional knowledge was positively and weakly associated with sports supplements belief scores ($r = .151$, $p = .002$), indicating that individuals with higher nutritional knowledge tended to report slightly stronger beliefs regarding sports supplements.

Table 4. Correlation between nutritional knowledge and sports supplements belief scores

Variables		Sports Supplements Belief
Nutritional Knowledge	r	.151**
	p	.002

Notes. r: Pearson correlation coefficient; **p < .01.

A simple linear regression analysis was conducted to examine whether nutritional knowledge predicted sports supplements belief scores (Table 5). Nutritional knowledge significantly predicted sports supplement belief scores ($B = 0.058$, $SE = 0.019$, $\beta = 0.151$, $t = 3.07$, $p = .002$). However, the explained variance was small ($R^2 = .023$; adjusted $R^2 = .021$), indicating that nutritional knowledge accounted for approximately 2% of the variance in sports supplement belief scores. These findings suggest that although nutritional knowledge is statistically associated with supplement-related beliefs, other factors are likely to play a greater role in shaping athletes' beliefs regarding sports supplements.

Table 5. Regression analysis results for the prediction of sports supplements belief

Model	B	Std. Error	β	t	p
Constant	13.518	2.113	---	6.399	< .001
Nutritional Knowledge	.058	.019	.151	3.069	.002

$R = .151$; $R^2 = .023$; Adj. $R^2 = .021$; $F(1,402) = 9.416$; $p = .002$

Notes. B: unstandardized coefficient; SE: standard error; β : standardized coefficient.

Discussion

The primary aim of this study was to examine whether nutritional knowledge predicts supplement-related beliefs among Turkish amateur athletes. The secondary aim was to evaluate nutritional knowledge levels and sports supplement beliefs across selected demographic characteristics.

The findings showed that nutritional knowledge significantly differed by gender, with female athletes demonstrating higher nutritional knowledge scores than male athletes. This difference may be related to gender-based differences in health awareness, interest in nutrition, and dietary responsibilities shaped by sociocultural factors. Previous studies similarly reported higher nutritional knowledge scores among female athletes and students compared to males (Bird & Rushton, 2020; Zaborowicz et al., 2016). In contrast, no significant gender-based differences were observed in sports supplement belief scores, suggesting that supplement-related beliefs may be influenced by factors other than gender. This result is consistent with the findings of Moreno et al. (2022), who reported no significant differences between male and female swimmers in supplement use.

Another important finding was that nutritional knowledge and sports supplement belief scores did not significantly differ according to participants' adequate and balanced nutrition status. This may indicate that self-reported eating habits can be shaped independently of knowledge and beliefs, potentially influenced by contextual factors such as time constraints, food availability, and lifestyle characteristics. Although some studies have demonstrated a positive association between nutritional knowledge and diet quality, this relationship has often been reported as weak, and knowledge alone may not be sufficient to produce substantial behavioral change (Koch et al., 2021). On the other hand, Akkartal and Gezer (2020) reported a stronger positive relationship between nutritional knowledge and diet quality. Taken together, these findings suggest that the link between nutritional knowledge and dietary behavior may vary depending on environmental, cultural, and socioeconomic conditions.

Regarding supplement use, athletes who reported previous use of nutritional supplements had significantly higher sports supplement belief scores compared to non-users, whereas nutritional knowledge did not differ between these groups. This suggests that supplement use may be more strongly related to beliefs and perceived benefits than to objective knowledge. A similar pattern was reported by Hartman and Siegrist (2016), who found that protein supplement users held stronger health and well-being beliefs than non-users, despite comparable knowledge levels. However, other studies have reported higher nutritional knowledge among supplement users (Vázquez-Espino et al., 2022), indicating that the relationship between supplement use and knowledge may differ depending on sample characteristics and contextual influences.

No significant differences were found in nutritional knowledge or sports supplement belief scores according to participants' knowledge of how to use nutritional supplements. This finding may reflect that self-reported knowledge about supplement use does not necessarily translate into informed behaviors. Consistent with this interpretation, previous research has shown that athletes often have misinformation about supplements and may lack adequate information regarding content and appropriate dosage (Şemşek et al., 2001; Çavdar et al., 2018). These studies highlight the role of external sources such as peers and coaches in shaping supplement-related behaviors and emphasize the need for evidence-based educational interventions.

Correlation analyses further indicated that age was positively associated with nutritional knowledge and negatively associated with sports supplement belief scores, both at a weak level. The positive association between age and nutritional knowledge may reflect the accumulation of life experience and increased exposure to nutrition-related information over time. Similar findings have been reported in previous studies, demonstrating increases in nutritional knowledge with age among athletes and individuals receiving sports training (Ceylan et al., 2022; Vázquez-Espino et al., 2022). Moreover, although the association between nutritional knowledge and sports supplement beliefs was statistically significant, it was weak ($r = .151$). Regression analysis also showed that nutritional knowledge significantly predicted sports supplement belief scores; however, the explained variance was small (approximately 2%). This indicates that while nutritional knowledge is related to supplement beliefs, additional psychological, social, and environmental determinants likely contribute more strongly to shaping these beliefs. In line with this interpretation, Bozkurt (2022) reported significant associations between nutritional knowledge and beliefs toward sports supplements. Similarly, Barjaktarovic Labovic et al. (2023) emphasized that athletes may report high supplement use despite insufficient knowledge, highlighting a critical need for effective and reliable education strategies.

Overall, the results of the present study suggest that nutritional knowledge may contribute to supplement-related beliefs among Turkish amateur athletes, but it represents only a limited explanatory factor. Therefore, future research should consider additional influences such as coaching guidance, social media exposure, team culture, and marketing-related factors to better explain supplement-related beliefs and behaviors.

Conclusion

This study found a weak but statistically significant positive association between nutritional knowledge and sports supplement beliefs among Turkish amateur athletes. Nutritional knowledge significantly predicted sports supplement beliefs; however, the explained variance was low (approximately 2%). These findings indicate that nutritional knowledge is related to supplement-related beliefs, although other determinants likely play a stronger role in shaping these beliefs and decisions.

From an applied perspective, nutrition education and supplement awareness programs may be beneficial for amateur athletes. Educational interventions should include not only general nutrition principles but also practical topics such as label reading, evidence-based supplement use, misconceptions, potential risks, and decision-making strategies based on scientific evidence. In addition, providing coaches and trainers with foundational nutrition education may strengthen the indirect influence they have on athletes' supplement-related decisions. Future studies should incorporate psychosocial and environmental variables (e.g., coach influence, social media exposure, peer norms, and team culture) to better explain supplement-related beliefs and behaviors. Longitudinal and intervention-based research designs may provide stronger evidence regarding the impact of nutrition education on athletes' beliefs and actual supplement use. Furthermore, comparing different sport branches and performance levels may enhance the generalizability of findings.

Limitations

This study has several limitations. First, data were collected using self-report measures, which may be subject to response bias. Second, the cross-sectional design prevents causal interpretations. Third, the sample included amateur athletes; therefore, findings may not be generalized to elite or professional athletes. Future studies using longitudinal designs and objective dietary assessments are recommended.

Conflicts of interest. The authors declare no conflict of interest.

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Use of Generative AI

Generative AI was used for language editing; authors reviewed and take responsibility.

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