

Nutrition Knowledge–Behavior Gap in Collegiate Athletes: Influence of Perceived Barriers on Dietary Practices

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ABSTRACT

Background: Nutrition knowledge plays a vital role in shaping dietary behavior in athletes. However, knowledge alone might not always result in healthy eating practices. Collegiate athletes often face barriers that influence their food selection and limit the application of nutrition knowledge.

Objectives: This research sought to explore the connection between nutrition awareness and eating patterns, as well as the impact of perceived obstacles on dietary choices among college athletes in India.

Materials and Methods: A cross-sectional study was carried out among 200 collegiate athletes from universities in the Delhi NCR region, India. Data were collected using structured and validated questionnaire assessing nutrition knowledge, dietary habits, and perceived barriers. Since the data did not follow a normal distribution, non-parametric tests were applied. Spearman's correlation was used to examine associations, and Multiple linear regression was conducted to identify predictors of dietary habits.

Results: Athletes showed moderate levels of nutrition knowledge, with wide variation in dietary habits. A strong link was found between understanding nutrition and eating patterns ($\rho = 0.489$, $p < 0.001$). Perceived barriers had a notable adverse impact on dietary behavior ($\beta = -0.675$, $p = 0.020$). The regression model explained 26.4% of the variance in dietary habits ($R^2 = 0.264$). Common barriers included time constraints, limited access to healthy foods, and financial limitations.

Conclusion: Nutrition knowledge alone is not sufficient to ensure healthy dietary behavior. Barriers limit its practical application. Interventions should combine education with strategies that address real-life challenges faced by athletes.

Keywords: *Nutritional awareness, Eating patterns, University athletes, Behavioral determinants, Food choice constraints*

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INTRODUCTION

Collegiate athletes play a vital role in competitive sports. They contribute to national and international performance. At the same time, they manage both academics and training. This creates significant physical and mental strain demands. Proper nutrition is essential in this context. It helps maintain energy balance, supports recovery, and reduces injury risk. Macronutrients such as carbohydrates, proteins, and fats are important for performance. Hydration and micronutrients also influence endurance and metabolic function [1], [2].

Despite this, nutrition knowledge does not always lead to healthy eating habits. Many studies show a gap between what athletes know and what they practice. This is often described as the “knowledge–behavior gap” [2], [3]. Athletes face several challenges in daily life. These include lack of time, limited finances, and poor access to

healthy foods. Such barriers can lessen the influence of nutrition knowledge [3], [4].

Social and behavioral influences also shape dietary habits. Athletes often depend on coaches, teammates, or online sources for nutrition advice. These sources might sometimes be untrustworthy [5], [6]. Cultural food habits and convenience-based choices also affect eating patterns. This makes it harder to follow recommended dietary guidelines [7].

The majority of current research originates from Western sources. There is limited evidence from India. The Indian university setting has different social and economic conditions. These factors may influence dietary behavior in a unique way. In addition, structured nutrition education is often lacking in academic systems. This can lead to poor

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awareness and weak application of nutrition knowledge [8–10].

Therefore, this study aims to investigate the connection between nutrition knowledge and dietary habits. It also evaluates the role of perceived barriers in shaping dietary behavior among collegiate athletes. This approach helps to better understand why knowledge alone is not enough and how different factors interact in real-life settings.

MATERIALS AND METHODS

A cross-sectional analytical study was conducted among collegiate athletes enrolled at universities in the Delhi NCR region, India. Initially, a total of 255 participants were recruited using a convenience sampling method. After excluding incomplete questionnaires, the sample size was deemed sufficient for the final analysis to detect moderate associations with acceptable statistical power.

The research plan received approval from the Institutional Review Board at GD Goenka University. All individuals involved granted written informed consent beforehand. Data confidentiality was maintained, and participation was voluntary.

Data were collected using a structured and validated questionnaire assessing nutrition knowledge, dietary habits and perceived barriers. Dietary patterns were assessed through a Food Frequency Questionnaire (FFQ). Participants also reported barriers including lack of knowledge, financial constraints, time limitations, limited access to healthy foods, and taste preferences.

Descriptive statistics, including the mean and standard deviation, were computed. Normality was tested using the Shapiro–Wilk test ($p < 0.001$). Non-parametric tests were therefore applied.

Spearman’s rank correlation was used to assess the relationship. The analysis continued with a stepwise multiple approach. Linear regression was performed to identify predictors of dietary habits. Analyses were conducted through SPSS software with significance at $p < 0.05$.

RESULTS

A total of 200 collegiate athletes were incorporated in the analysis. The sample consisted of 67% males and 33% females.

Descriptive statistics of nutrition knowledge, dietary habits, and perceived barriers are shown in **Table 1**. Nutrition knowledge scores indicated a moderate level of awareness among participants. Dietary habit scores showed considerable variation, suggesting differences in eating patterns across the sample. Overall, 48% of athletes were classified as having moderate nutrition knowledge, while 40.5% demonstrated unhealthy dietary habits.

The distribution of perceived barriers is also shown in **Table 1**. Time constraints (31%) and limited access to healthy food (30%) were the most frequently reported barriers. Other barriers included financial limitations, lack of nutrition knowledge, and taste preferences, though these were less commonly reported.

Table 1: Descriptive Statistics and Normality Tests for Nutrition Knowledge, Dietary Habits, and Barriers to Nutrition

	Nutrition Knowledge Score	Dietary Habit Score	Barriers to Nutrition
Valid Responses	200	200	200
Missing Responses	0	0	0
Median	5	9	2
Mean	4.745	10.03	1.89
Std. Deviation	2.266	5.142	1.138
Skewness	-0.588	0.3	-0.278
Std. Error of Skewness	0.172	0.172	0.172
Kurtosis	-0.71	-1.232	-0.926
Std. Error of Kurtosis	0.342	0.342	0.342
Shapiro-Wilk Statistic	0.913	0.93	0.889
Shapiro-Wilk p-value	< 0.001	< 0.001	< 0.001
Minimum	0	2	0
Maximum	8	20	4

The relationships between study variables are presented in **Table 2**. A significant positive relationship was identified between understanding of nutrition and eating patterns through Spearman’s correlation analysis. ($\rho = 0.489, p < 0.001$). There were weak but statistically significant

inverse relationships identified between nutrition knowledge and perceived barriers ($\rho = -0.229, p = 0.001$), as well as between dietary habits and barriers ($\rho = -0.216, p = 0.002$).

Table 2: Spearman's Correlation Matrix for nutrition knowledge, dietary habits, and nutrition barriers.

Variable	Nutrition knowledge score	Dietary habit Score	Barriers to nutrition	P-value (nutrition knowledge score)	P-value (dietary habit score)	P-value (nutrition barriers)
Nutrition Knowledge	Spearman's rho	—	—	—	—	—

Score						
Dietary Habit Score	0.489	Spearman's rho	—	< .001	—	—
Barriers to Nutrition	-0.229	-0.216	Spearman's rho	0.001	0.002	—

The findings from the multiple linear regression analysis are shown in **Table 3**. The overall regression model was statistically significant ($F(2,197) = 35.311, p < 0.001$). The model accounted for 26.4% of the variance in dietary habit scores ($R^2 = 0.264$).

Table 3- Stepwise regression analysis of nutrition knowledge and nutrition barriers as predictors of dietary habits.

A) Model Summary for Dietary Habit Score

Model Summary-Dietary Habit Score				
Model	R	R2	Adjusted R2	RMSE
M0	0	0	0	5.142
M1	0.514	0.264	4.434	

Note: M1 includes Nutrition Knowledge Score, Barriers to Nutrition

B) ANOVA Table for the Regression Model

Model		Sum of Squares	df	Mean Square	F	P
M1	Regression	1388.521	2	694.261	35.311	<0.001
	Residual	3873.299	197	19.661		
	Total	5261.82	199			

C) Regression Coefficients and Collinearity Statistics

Model	Predictor	Unstandardized Coefficient	Standard Error	Standardized Coefficient	t-value	p-value
M0	Intercept	10.03	0.364		27.585	<0.001
M1	Intercept	6.42	1.026		6.258	<0.001
	Nutrition knowledge score	1.029	0.144	0.454	7.158	<0.001
	Nutrition barriers	-0.675	0.286	-0.149	-2.355	0.02

Nutrition knowledge was identified as a significant positive predictor of dietary habits ($\beta = 1.029, p < 0.001$), indicating that better dietary habits correlated with higher knowledge scores. In contrast, perceived barriers were a significant negative predictor ($\beta = -0.675, p = 0.020$), suggesting that increased barriers were associated with poorer dietary habits.

association suggests that knowledge alone explains only part of the variation in behavior.

DISCUSSION

This study focused on examining the relationship between nutrition knowledge, perceived barriers, and dietary habits among collegiate athletes. The findings show that nutrition knowledge is positively associated with dietary behavior, while perceived barriers have a negative influence. These results confirm that both individual knowledge and external constraints play an essential role in shaping dietary practices.

A key finding of the study is the negative impact of perceived barriers on dietary habits. Barriers such as time constraints, limited access to healthy food, and financial limitations were commonly reported. These factors showed an inverse relationship with dietary practices. This result aligns with previous observations highlighting that environmental and structural constraints can limit healthy eating, even when knowledge is adequate [13], [14].

There is a moderate positive correlation between understanding of nutrition and eating habits. This suggests that athletes with greater knowledge tend to follow healthier dietary patterns. Similar findings have been documented in previous studies, where improved nutrition knowledge was linked with better dietary quality and food choices [11], [12]. However, the strength of this

The regression analysis results reinforce this finding. Nutrition knowledge was a positive predictor, while barriers negatively influenced dietary habits. Although the model explained a moderate proportion of variance. It further indicates that additional behavioral factors could be influential. Factors such as motivation, attitudes, and social environment have been recognised as important determinants of dietary behavior [15], [16].

The findings highlight the presence of a knowledge–behavior gap among collegiate athletes. While athletes may possess basic nutritional understanding, this does not always translate into practice. This gap may be explained by competing demands and limited resources. In the

Indian context, these challenges could be more noticeable because of variability in institutional support and access to structured nutrition guidance [17], [18].

From a practical perspective, the findings emphasize the need for integrated approaches. Educational interventions alone may not be sufficient. There is a need to combine nutrition education with strategies that address real-life barriers. Improving access to affordable healthy food and incorporating structured nutrition programs within institutions may help improve dietary practices [19–21].

CONCLUSION

This study shows that nutrition knowledge is linked to better dietary habits in collegiate athletes. However, knowledge alone is not enough. Many athletes still struggle to follow healthy diets.

Perceived barriers play a major role. Common issues include lack of time, limited access to healthy foods, and financial constraints. These factors directly affect food choices.

A clear gap exists between knowledge and practice. Athletes may understand nutrition but fail to apply it in daily life. This indicates that both individual and environmental factors influence dietary behavior.

Interventions should go beyond education. Practical solutions are needed. These include improving access to affordable healthy food and providing structured nutrition support.

The findings highlight the need for targeted strategies. These efforts can contribute to better eating habits and enhance athletic performance..

ETHICAL APPROVAL: Ethical approval was obtained from GD Goenka University, the Research Ethics Committee of the School of Healthcare and Allied Sciences (R&D/SA/12/24/248).

INFORMED CONSENT: Informed consent was obtained from all participants involved in the study, ensuring respect for confidentiality and voluntariness principles.

DECLARATION OF CONFLICTS OF INTEREST:

The authors declare no conflict of interest.

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