Airo International Journal
Peer-Reviewed
Multidisciplinary

ISSN: 2320-3714
Volume:3 Issue:1
July 2026
Impact Factor:11.9
Subject: Physical Education

Comparing Nutritional Knowledge Between University Athletes and Non-Athletes: Insights into Weight Management, Macronutrient and Micronutrient Awareness, and Sports Nutrition Practices

Mr. Kunal Kumar[1], Dr. Varender Singh Patial[2]
[1]Research Scholar, Department of Physical Education, IIMT University, Meerut, Uttar Pradesh, India
[2] Professor, Department of Physical Education, IIMT University, Meerut, Uttar Pradesh, India

DECLARATION: I AS AN AUTHOR OF THIS PAPER /ARTICLE, HERE BY DECLARE THAT THE PAPER SUBMITTED BY ME FOR PUBLICATION IN THE JOURNAL IS COMPLETELY MY OWN GENUINE PAPER. IF ANY ISSUE REGARDING COPYRIGHT/PATENT/OTHER REAL AUTHOR ARISES, THE PUBLISHER WILL NOT BE LEGALLY RESPONSIBLE. IF ANY OF SUCH MATTERS OCCUR PUBLISHER MAY REMOVE MY CONTENT FROM THE JOURNAL WEBSITE. FOR THE REASON OF CONTENT AMENDMENT /OR ANY TECHNICAL ISSUE WITH NO VISIBILITY ON WEBSITE /UPDATES, I HAVE RESUBMITTED THIS PAPER FOR THE PUBLICATION.FOR ANY PUBLICATION MATTERS OR ANY INFORMATION INTENTIONALLY HIDDEN BY ME OR OTHERWISE, I SHALL BE LEGALLY RESPONSIBLE. (COMPLETE DECLARATION OF THE AUTHOR AT THE LAST PAGE OF THIS PAPER/ARTICLE

Abstract

Background: Nutritional knowledge is critical for enhancing sport performance, health and nutrition-related deficiencies. Given that college students are likely to be involved in sports on a regular basis, including training and competition, they are predicted to have a high nutritional knowledge as compared to the general population.

Methods: The study used a descriptive-comparative survey that involved 400 university students (200 athletes and 200 non-athletes). The students who had taken part in competitions organized by the Association of Indian Universities (AIU), were ruled out and the athletes were included. Nutrition Sport Knowledge Questionnaire was used to check Nutritional knowledge. Data analysis was done by IBM SPSS Version 26. Descriptive statistics, Cohen's d and Welch's independent-samples t-test was used for the findings.

Results: All four domains showed significantly better knowledge scores in athletes than in those who were not athletes. Significant differences were observed in weight management ($t = 9.23$, $p < 0.001$), macronutrients ($t = 10.01$, $p < 0.001$), micronutrients ($t = 6.29$, $p < 0.001$), and sports nutrition ($t = 11.93$, $p < 0.001$).

Conclusions: The nutrition knowledge of University athletes had higher than non-athletes. This study validate the inclusion of a well formulated nutritional's education programs in universities, especially with non-athlete students.

Key words: Sports Nutrition, Nutritional Knowledge, Athletes, Non-Athletes, University Students, Weight Management**.**

Airo International Journal
Peer-Reviewed
Multidisciplinary

ISSN: 2320-3714
Volume:3 Issue:1
July 2026
Impact Factor:11.9
Subject: Physical Education

1. INTRODUCTION

Nutritional knowledge is a basic factor that affects weight management and sports performance in various populations in the choices of energy consumption, macronutrient distribution, hydration status, timing and recovery strategies (Sharma et al. (2013). Even small gains in nutrition literacy can lead to healthier food choices, portion control and following evidence-based dietary recommendations; all of which help influence positive health outcomes in the context of weight management (Weight et al., 2016) (Hayakawa et al., 2026).

In athletes, knowledge about energy availability, carbohydrate and protein requirements, fluid and electrolyte balance and supplementation practices support optimal training adaptations, performance and injury prevention, and gaps in knowledge can lead to suboptimal fueling practices, training recovery, and predispose them to RED-S and disordered eating (Trakman et al., 2016). In non-athletes, nutritional literacy is also important, as overweight, obesity and metabolic risk are increasing, and combined with practical nutrition skills like meal planning and NIP, knowledge-based education can promote sustainable weight-management behaviors (Hopper et al., 2025).

There is an increasing body of evidence showing that even athletes who are not involved in sport have incomplete knowledge of fundamental nutrition principles, with deficiencies particularly in micronutrient requirements, hydration, sports supplements and understanding of sport nutrition guidelines (McCabe et al., 2021). There is also methodological variation and no current or consistent instruments to assess nutrition knowledge in athletic populations across different studies, making it difficult to compare results from individual studies and to evaluate nutrition knowledge education. There is, however, some converging evidence that nutrition literacy is linked to healthier food choices, more evidence-based fueling practices, and better performance and health outcomes even when energy balance is met (Sevim et al., 2023). The scope of education interventions has expanded to both athletes and non-athletes, and more recent research has focused on integrated approaches that take into account content, delivery and psychosocial context in order to be effective.

Sport-nutrition education programs and literacy-enhancing interventions have demonstrated potential in boosting knowledge, self-efficacy, and practical implementation of fueling,

ISSN: 2320-3714
Volume:3 Issue:1
July 2026
Impact Factor:11.9
Subject: Physical Education

hydration, and recovery strategies, but ongoing behavior modification and transition to practice are areas for further development (Jolo, 2024). In the general population, public health focused nutrition education, together with skills training, can help to foster behaviour change, which can contribute to weight management and cardiovascular risk reduction (Bauhaus et al., 2023). With the interest in weight management and sports nutrition and the wide range of populations of athletes and non-athletes in competitive, recreational and educational contexts, there is a need for integrated research to describe the current state of knowledge, pinpoint persistent knowledge gaps to facilitate targeted educational programs. There are points of agreement and nuance in synthesis of the evidence base. First, core domains of energy balance, macronutrient needs, hydration, nutrient timing and supplementation are all important both for weight management and for sports nutrition, with varying emphasis depending on the audience and athletes' sport requirements (Weight et al., 2016). Third, tools for assessing nutrition knowledge must be valid, and aligned with current nutrition guidelines and sport-specific considerations. Fourth, educational interventions are effective when designing with sex differences in view, and pointing to sport type, cultural context and delivery modality to maximize uptake and retention of knowledge and translation into healthier choices (Palani et al., 2024).

Recent advances in the area have focused on nutrition knowledge assessments among populations of diverse athletes and the investigation of interventions other than classroom-based. Scoping reviews and primary studies in 2020-2025 have identified continued gaps in general and sports-specific nutrition knowledge among athletes, and that the validated, up-to-date tools for measuring nutrition knowledge were not widely available across languages and cultures (Alcock et al., 2024). Recent research in education interventions with specific populations (dance students, adolescent athletes, para-athletes) has indicated positive shifts in nutrition knowledge and health outcomes, and has emphasized the need for ongoing, longitudinal, multi-component interventions to foster lasting behavioral changes (Kim et al., 2025).

1.1 Objectives

1. To compare the knowledge about weight management among athletes and non-athletes.
2. To compare knowledge of macronutrients.

ISSN: 2320-3714
Volume:3 Issue:1
July 2026
Impact Factor:11.9
Subject: Physical Education

3. To make comparisons in knowledge about micronutrients.
4. To compare Sports Nutrition knowledge.
5. To compare if there is significant differences in nutritional knowledge among athletes and non-athletes.

2. METHODOS

2.1. Research Design: Descriptive-comparative survey design.

2.2. Subjects: 400 university students between the age of 17 and 27 years (200 athletes and 200 non-athletes).

2.3. Sampling Technique: Purposive sampling.

2.4. Study Population: University students from four universities:

a) University of Rajasthan.
b) Banasthali Vidyapith.
c) Jai Narain Vyas University.
d) Mohanlal Sukhadia University.

2.5.Inclusion Criteria: Athletes that were involved in officially recognised AIU competitions.

Students aged 17–27 years.

2.6. Exclusion Criteria: Students in Nutrition or Dietetics disciplines.

Incomplete questionnaire responses.

2.7. Research Instrument: Nutrition for Sport Knowledge Questionnaire (NSKQ).

2.8. Variables: The core variables includes macronutrients, micronutrients, sports nutrition and weight management.

2.9. Data analysis: The data analysis was done by the software SPSS 26.0. Descriptive statistics (Mean and Standard Deviation) and Welch's Independent Samples t-test were used and the level of significance was set at 0.05.

Airo International Journal
Peer-Reviewed
Multidisciplinary

ISSN: 2320-3714
Volume:3 Issue:1
July 2026
Impact Factor:11.9
Subject: Physical Education

3. RESULT

Table 1. This study is a comparison of nutritional knowledge among athletes and non-athletes.

Variable	Athletes Mean ± SD	Non-Athletes Mean ± SD	t-value	p-value	Cohen's d
Weight Management	11.09 ± 1.90	9.11 ± 2.36	9.23	<0.001	0.92
Macronutrients	10.95 ± 1.91	8.79 ± 2.38	10.01	<0.001	1.00
Micronutrients	9.70 ± 2.17	8.28 ± 2.36	6.29	<0.001	0.63
Sports Nutrition	11.63 ± 2.17	8.94 ± 2.34	11.93	<0.001	1.19

The descriptive analysis showed that the University athletes had mean scores that were higher than the non-athletes in all four domains. The athletes had a mean score of 11.09 ± 1.90 in weight management while non-athletes had a score of 9.11 ± 2.36. This difference was highly significant as seen by the Welch's independent samples t-test ($t = 9.23$, $p < 0.001$) and was of large effect size (Cohen's $d = 0.92$).

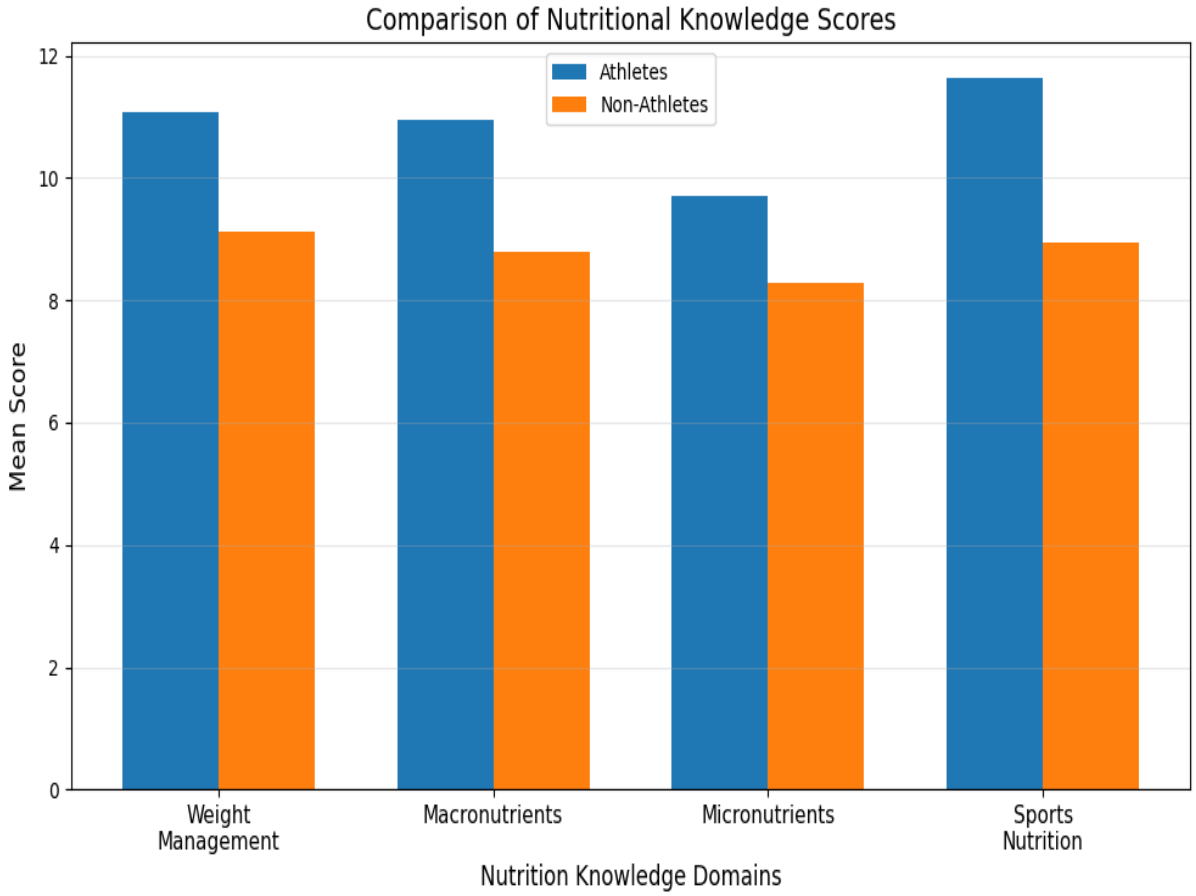
Likewise, athletes had a much higher knowledge score on macronutrients (10.95 ± 1.91) compared to non-athletes (8.79 ± 2.38). This observed difference was statistically significant ($t = 10.01$, $p < 0.001$) and was considered to be a large practical difference ($d = 1.00$).

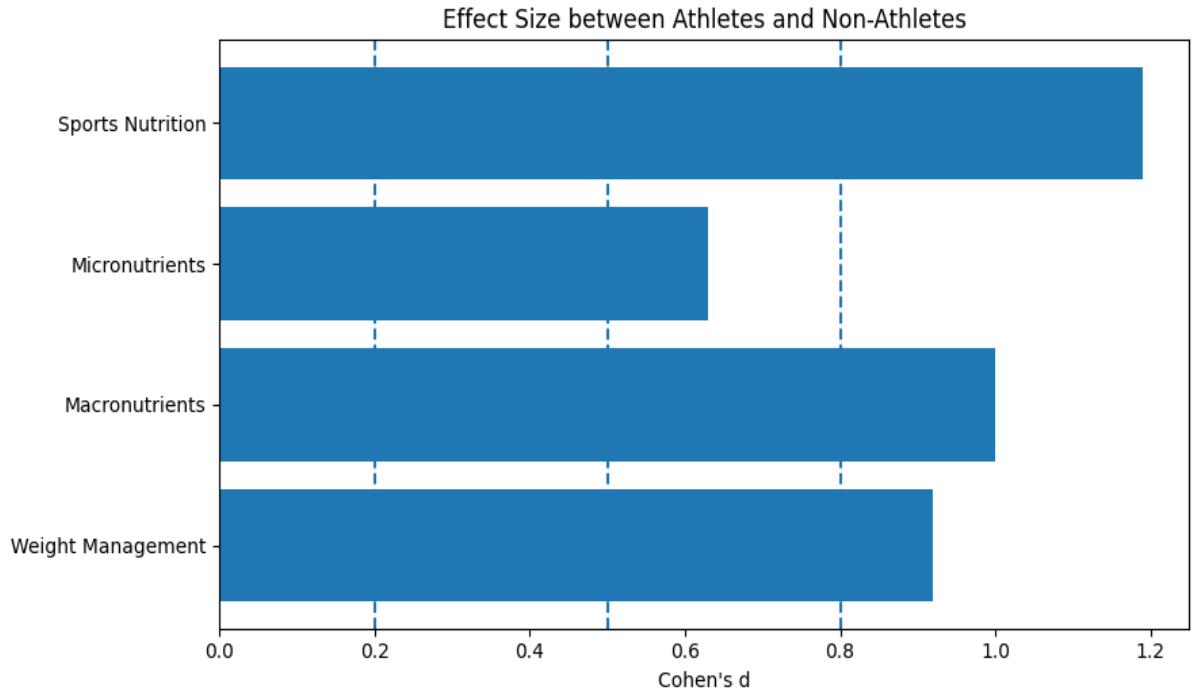
Athletes scored 9.70 ± 2.17 for micronutrient knowledge and non-athletes scored 8.28 ± 2.36. The difference was still statistically significant ($t = 6.29$, $p < 0.001$) with a medium effect size ($d = 0.63$).

Most difference was found in sports nutrition knowledge. Athletes recorded a mean score of 11.63 ± 2.17, while non-athletes achieved 8.94 ± 2.34. The difference was found to be highly significant ($t = 11.93$, $p < 0.001$) with a very large effect size ($d = 1.19$).

Airo International Journal
Peer-Reviewed
Multidisciplinary

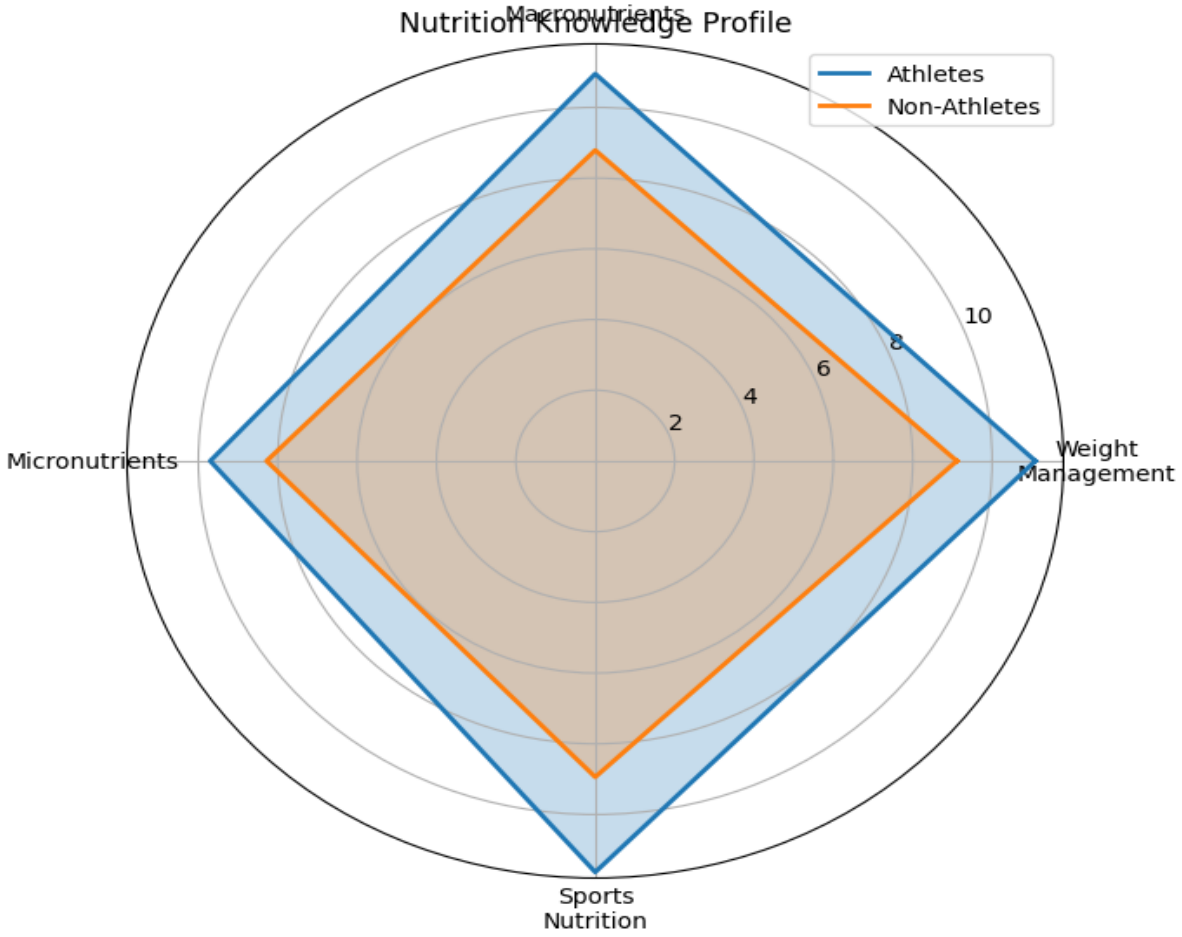
ISSN: 2320-3714
Volume:3 Issue:1
July 2026
Impact Factor:11.9
Subject: Physical Education





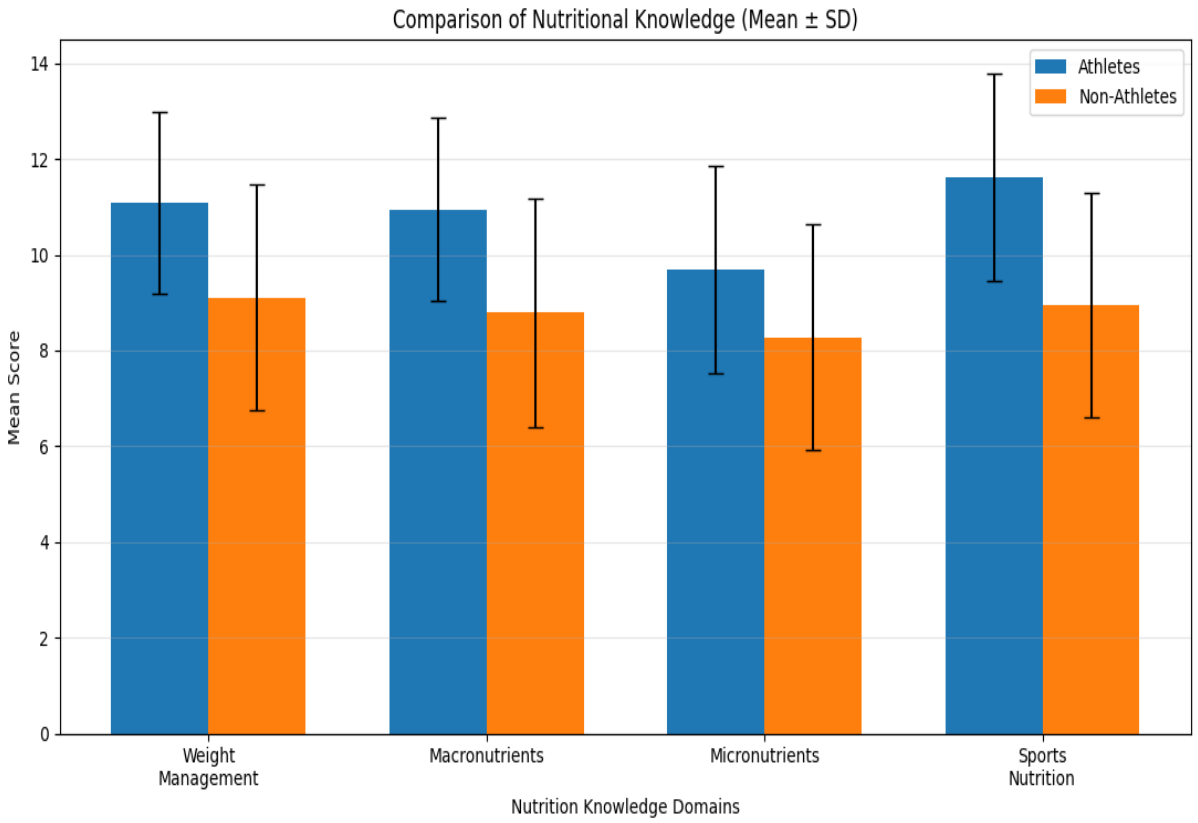
Airo International Journal
Peer-Reviewed
Multidisciplinary

ISSN: 2320-3714
Volume:3 Issue:1
July 2026
Impact Factor:11.9
Subject: Physical Education



Airo International Journal
Peer-Reviewed
Multidisciplinary

ISSN: 2320-3714
Volume:3 Issue:1
July 2026
Impact Factor:11.9
Subject: Physical Education



4. DISCUSSION

The findings of this study confirm the hypothesis that involvement in competitive sports is positively related to nutrition knowledge. The largest effect size was seen for sports nutrition (Cohen's d = 1.19), indicating athletes' understanding of sport-specific dietary practices, hydration, nutrient timing, and recovery nutrition was much greater than in the other categories. This may be because of increased contact with coaches, sports scientists, and nutrition education provided during training and competition.

There was also a large effect size for Macronutrient Knowledge (d = 1.00) suggesting that athletes have greater knowledge of the role of carbohydrates, proteins, and fats in sports and exercise. The magnitude of the effect was also large for weight management knowledge (d = 0.92), which was related to athletes' knowledge of body composition management and energy balance.

ISSN: 2320-3714
Volume:3 Issue:1
July 2026
Impact Factor:11.9
Subject: Physical Education

The effect size was comparatively small (d = 0.63), although micronutrient knowledge was significantly higher amongst the athletes. This indicates that the level of knowledge about vitamins and minerals is still an area that needs improvement in athletes and non-athletes.

The results, overall, agree with previous literature which found that sport and structured training environments have a positive effect on the nutritional knowledge. However, the knowledge gaps indicate the need for a comprehensive nutrition education programmes in universities.

Conclusion

It is concluded that University athletes have significantly greater nutritional knowledge than non-athletes in all four domains evaluated. The differences that were observed were not only statistically significant, but were also practically important with medium and large effect sizes. Sports nutrition had the largest inter-group differences among the domains evaluated, followed by macronutrients and weight management. This indicates that sport involvement is beneficial in improving nutrition-related knowledge via greater access to structured training and sports science support. However, the relatively low micronutrient knowledge scores suggest that further educational initiatives are needed, even for athletes. Consequently, nutrition education based on evidence should be incorporated into athletic development programs and the general health education programs at the university.

Reference

1. Sharma, A., Schwartz, S. M., & Méndez, E. (2013). Hospital volume is associated with survival but not multimodality therapy in Medicare patients with advanced head and neck cancer. Cancer, 119(10), 1845–1852. https://doi.org/10.1002/cncr.27976
2. Weight, E. A., Navarro, K. M., Smith-Ryan, A. E., & Huffman, L. T. (2016). Holistic Education through Athletics: Health and Health-Literacy of Intercollegiate Athletes and Active Undergraduate Students. Journal of Higher Education Athletics & Innovation, (1), 38–60. https://doi.org/10.15763/issn.2376-5267.2016.1.1.38-60
3. Hayakawa, K., MITSUYAMA, K., & Abe, T. (2026). Annual transitions in nutrition, training, and interpersonal relationships of Japan's national champion university rowing team. Frontiers in Sports and Active Living, 8. https://doi.org/10.3389/fspor.2026.1808743

ISSN: 2320-3714
Volume:3 Issue:1
July 2026
Impact Factor:11.9
Subject: Physical Education

4. Trakman, G., Forsyth, A., Devlin, B. L., & Belski, R. (2016). A Systematic Review of Athletes' and Coaches' Nutrition Knowledge and Reflections on the Quality of Current Nutrition Knowledge Measures. Nutrients, 8(9), 570. https://doi.org/10.3390/nu8090570
5. Hopper, C., Mooney, E., & McCloat, A. (2025). Nutritional Intake and Dietary Knowledge of Athletes: A Scoping Review. Nutrients, 17(2), 207. https://doi.org/10.3390/nu17020207
6. McCabe, E. M., Ketcham, C. J., & Hall, E. E. (2021). Good Food, Good Mood: Perspectives on the Relationship Between Nutrition and Mental Health With Division I Collegiate Athletic Programs. Frontiers in Sports and Active Living, 3. https://doi.org/10.3389/fspor.2021.692601
7. Sevim, Y., Thurecht, R., & Pelly, F. (2023). Validation of a Turkish Version of the Athlete Food Choice Questionnaire. Nutrients, 15(16), 3612. https://doi.org/10.3390/nu15163612
8. Jolo, M. U. (2024). Volleyball Athletes Training Program Towards Their Achievements. International Journal of Multidisciplinary Sciences, 2(2), 176–189. https://doi.org/10.37329/ijms.v2i2.3141
9. Bauhaus, H., Jensen, P., Braun, H., & Thevis, M. (2023). Evaluation of Validity and Reliability of a German General and Sports Nutrition Knowledge Questionnaire for Athletes and Coaches (GSNKQ-AC). Nutrients, 15(22), 4844. https://doi.org/10.3390/nu15224844
10. Palani, B., Raj, Y. C. L., Kalmykova, Y., Sanjaykumar, S., & Корсун, С. (2024). The effectiveness of a 12-week sport nutrition education intervention on female volleyball players performance. Physical Rehabilitation and Recreational Health Technologies, 3(9), 151–160. https://doi.org/10.15391/prrht.2024-9(3).05
11. Alcock, R., Hislop, M., Vidgen, H. A., & Desbrow, B. (2024). Youth and Adolescent Athlete Musculoskeletal Health: Dietary and Nutritional Strategies to Optimise Injury Prevention and Support Recovery. Journal of Functional Morphology and Kinesiology, 9(4), 221. https://doi.org/10.3390/jfmk9040221
12. Kim, J. Y., Kim, S. Y., Lee, S. M., & An, Y. H. (2025). A study on the nutritional intake status and nutrition awareness of Korean national athletes with disabilities. Physical Activity and Nutrition, 29(4), 83–91. https://doi.org/10.20463/pan.2025.0038

Airo International Journal
Peer-Reviewed
Multidisciplinary

ISSN: 2320-3714
Volume:3 Issue:1
July 2026
Impact Factor:11.9
Subject: Physical Education

Author's Declaration

I as an author of the above research paper/article, here by, declare that the content of this paper is prepared by me and if any person having copyright issue or patent or anything otherwise related to the content, I shall always be legally responsible for any issue. For the reason of invisibility of my research paper on the website /amendments /updates, I have resubmitted my paper for publication on the same date. If any data or information given by me is not correct, I shall always be legally responsible. With my whole responsibility legally and formally have intimated the publisher (Publisher) that my paper has been checked by my guide (if any) or expert to make it sure that paper is technically right and there is no unaccepted plagiarism and hentriacontane is genuinely mine. If any issue arises related to Plagiarism/ Guide Name/ Educational Qualification /Designation /Address of my university/ college/institution/ Structure or Formatting/ Resubmission /Submission /Copyright /Patent /Submission for any higher degree or Job/Primary Data/Secondary Data Issues. I will be solely/entirely responsible for any legal issues. I have been informed that the most of the data from the website is invisible or shuffled or vanished from the database due to some technical fault or hacking and therefore the process of resubmission is there for the scholars/students who finds trouble in getting their paper on the website. At the time of resubmission of my paper I take all the legal and formal responsibilities, If I hide or do not submit the copy of my original documents (Andhra/Driving License/Any Identity Proof and Photo) in spite of demand from the publisher then my paper maybe rejected or removed from the website anytime and may not be consider for verification. I accept the fact that as the content of this paper and the resubmission legal responsibilities and reasons are only mine then the Publisher (Airo International Journal/Airo National Research Journal) is never responsible. I also declare that if publisher finds Any complication or error or anything hidden or implemented otherwise, my paper maybe removed from the website or the watermark of remark/actuality maybe mentioned on my paper. Even if anything is found illegal publisher may also take legal action against me

Mr. Kunal Kumar
Dr. Varender Singh Patial

******