Original Research

General Nutrition Knowledge, and Dietary Intake among Sportsmen and Coaches: A Review Study

Dinesh Dagar[1], Mohd Hafizur Rehman Ansari[2], Payal Mahajan[3]

[1]Ph.D.Scholar, [2]Assistant Professor, Department of Nutrition & Health, School of Medical And Allied Sciences, GD Goenka, [3]G D Goenka educational city, Sohna - Gurgaon Rd, Sohna, Haryana.

How to cite this article: Dinesh Dagar, Mohd Hafizur Rehman Ansari. General Nutrition Knowledge, and Dietary Intake among Sportsmen and Coaches: A Review Study. Indian Journal of Public Health Research and Development/Volume 15 No. 2, April - June 2024.

Abstract

Nutrition knowledge is an important factor that influences the nutritional status and health of the individual, group or community. Research studies have been trying to develop a reliable tool which can measure nutrition-related knowledge, nutrition-related awareness and its effect on dietary behaviour. Sports nutritionists usually base their dietary interventions on a nutrition education program with dietary guidelines. There are no. of cross-sectional studies for both coaches and athletes, reporting on nutrition knowledge. Achieving optimal physical condition and maximising athletic performance both depend heavily on nutrition. Our diet provides our bodies with the energy and nutrients they need to sustain physical activity, improve muscular function, and aid in recuperation. Any physical fitness program is incomplete without nutrition as it is an integral part of physical fitness. For any sportsman, the dietary goal is to obtain adequate nutrition to improve their health and fitness or performance in sports.[4] A carefully organized nutrition program greatly improves athletic performance.

Nutritional status is a crucial factor in determining the physical fitness and training of a sports individual. For sportsmen energy requirement or nutrient requirements are high due to their game. As it is known, appropriate nutrition improves the physical performance of the sportsmen. On the other hand, inadequate intake of nutrients leads to nutrient deficiencies therefore leading to poor performance and health problems. Many studies have provided strong evidence that optimal nutrition supports physical activity, recovery and athlete performance. However Apart from less nutritional knowledge, there are several factors such as restrictive dietary intake or excessive exercise which influence healthy eating. In addition, lack of knowledge, zeal to follow a nutritious diet, lack of money and lack of time, can be a potential reason not to follow a healthy diet. Athletes generally rely on their coaches for nutrition-related guidance. So, when coaches have less knowledge about nutrition it can be a potential problem for athletes to follow a healthy diet.

In some Cross-sectional studies, it is found that Coaches Play a key role in providing nutritional-related information. However, they were not aware of the importance of nutrition on performance therefore not giving the necessary importance to their diets. Coaches have inadequate knowledge about sports nutrition and their role is critical as they are prime contact for the athletes to know about their diet to enhance their performance.

Keywords: Sportsmen, Nutritional knowledge, Dietary intakes, Coaches, Nutritional status, Physical fitness, Athlete, Dietary behaviour, Diet.

Corresponding Author: Dinesh Dagar, Ph.D.Scholar, Department of Nutrition & Health, School of Medical And Allied Sciences, GD Goenka.

E-mail: dineshdagar33@gmail.com

Contact No. 7015303659

Submission date: May 26, 2023, **Revision date:** Jun 9, 2023 **Published date: Apr 4 2024**

Introduction

Nutrition knowledge is an important factor that influences the nutritional status and health of the individual, group or community. Nutrition knowledge is an important tool in assessing the nutritional status of an individual, group or community. Research studies have been trying to develop a reliable tool which can measure nutrition-related knowledge, nutrition-related awareness and its effect on dietary behaviour.[1,2] Sports nutritionists usually base their dietary interventions on a nutrition education program with dietary guidelines. There is no. of cross-sectional studies for both coaches and athletes, reporting on nutritionknowledge.[3]

Any physical fitness program is incomplete without nutrition as it is an integral part of physical fitness. For any sportsman, the dietary goal is to obtain adequate nutrition to improve their health and fitness or performance in sports.[4]A carefully organized nutrition program greatly improves athletic performance.[5]

Nutritional status is a crucial factor in determining the physical fitness and training of a sports individual. For sportsmen energy requirement or nutrient requirements are high due to their game. As it is known, appropriate nutrition improves the physical performance of the sportsmen.On the other hand, inadequate intake of nutrients leads to nutrient deficiencies therefore leading to poor performance and health problems. Many studies have provided strong evidence that optimal nutrition supports physical activity, recovery and athlete performance. However Apart from less nutritional knowledge, there are several factors such as restrictive dietary intake or excessive exercise which influence healthy eating.[6,7,8,9] In addition, lack of knowledge, zeal to follow a nutritious diet, lack of money and lack of time, can be potential reasons to not to follow a healthy diet.[10]Athletes generally rely on their coaches for nutrition-related guidance. So, when coaches have less knowledge about nutrition it can be a potential problem for athletes to follow a healthy diet.[11-14]

In some Cross-sectional studies, it is found that Coaches Play a key role in providing nutritional-related information. However, they were not aware of the importance of nutrition on performance therefore not giving the necessary importance to their diets. (Evaluation of the nutrition knowledge of sports department students of universities). Coaches have inadequate knowledge about sports nutrition and their role is critical as they are prime contact for the athletes to know about their diet to enhance theirperformance.[15,16,17] Sportsmen who have physical education as their subject major show greater nutrition knowledge.[18]

A cross-sectional study to identify the nutritional knowledge which included the192ATs, 71SCSs, 185 athletes and 131 coaches. For data analysis, descriptive statics have been used. To examine the distribution of nutrition knowledge of different populations used in the study, the chi-square test has been used. One way ANOVA test has been applied to comparing different study groups for knowledge and healthy eating habits. For the application of these tests SPSS Software. The significance level was set at 0.05 for all analyses. Studies revealed that ATs and SCSs have adequate and Athletes, and coaches have inadequate nutrition knowledge about nutrition.[15]

A study was conducted on the students of the Syrian university which aimed to find out the relationship between anthropometric measurements, socioeconomic status, type of university and nutrition knowledge. For the assessment of nutritional knowledge, a questionnaire adapted from Paramenter and Wardle has been used. Total number of the study participants was 998. Nutritional knowledge was higher in females as compared to male participants in the study. Total nutritional knowledge was higher in private university students as compared to public universities.[1]

A study that conducted on a 21 Rugby player to assess the relationship between the level of nutritional knowledge and dietary habits of the elite player. A general nutritional knowledge questionnaire was used to assess nutrition knowledge and a Food frequency questionnaire was used for the dietary habit assessment. Results showed that general nutritional knowledge was adequate in the player.

Methodology

A literature search has been done by using keywords like general nutrition knowledge, diet

knowledge, sportsmen, Coaches, athletes and diet, and dietary behaviour. Studies for the macronutrient, assessment have been excluded. All of the abstracts have undergone a rigorous screening to ensure that they are appropriate for review. From the references of the articles, further articles were also taken.

Exclusion and Inclusion criteria

Studies that include the general population as the study population have been not included in this review report. Studies on sportsmen, athletes, swimmers, or any college player have been included.

Result and Discussion

250 results were yielded in the aftermath of the search and these were then followed by the exclusion of duplicates and articles where full text was not available. For this review, 26 studies were considered, most of them had cross-sectional study designs which concentrated on the measurement of nutrition knowledge in American college athletes[19,20,21,22,23,24,25,26]. The other four papers assessed nutrition knowledge among coaches[27,28,29,30]. Masters-level athletes' nutrition knowledge was never examined in any study. In this review seventeen nutrition knowledge (NK) tools were used either in their original form or adapted versions as reflected by various authors within the included studies[31,32,20,33,16,34]. Different devices have been employed for appraising nutritional familiarity essentially making it impossible to draw a direct comparison between findings. Parmenter and Wardle developed a General Nutrition Knowledge Questionnaire which has been used in three different studies[35].In three separate tests undergraduate students showed that the lowest score was realized through- subsections: Recommendations for diet, sources of food and nutrients, the choice of foodstuffs for daily needs and diet-disease associations. These three studies had the lowest score in subsections of diet and disease relation as well as the highest in subsections for sources of foods or nutrients among the control group, test group dietary recommendation[36,37]. Sports Nutrition Knowledge Questionnaires (SNKQ) were used in six studies that underwent content validation and construct [32]. The results were different with overall scores that ranged from 48% to 54.7%[38,39,41,42] Some investigations indicated low scores on supplement sections whereas others found high performance on nutrient fluids as well as recovery[38,39,40]. Direct comparisons between adaptations and modifications impeded them. Furthermore, ULTRA-Q adaptation for ultra-endurance athletes and Torres-McGehee et al.'s tool adaptations were employed showing varied scores across sports.[15] Similarly Devlin & Belski's tool plus Nutrition for Sport Knowledge Questionnaire (NSKQ), yielded dissimilar scores as well as sub-sectional performances among athletes[16, 38,42,44] Twelve studies have assessed dietary intake using various methods including FFQs; 24-hour recalls; food diaries; and semi-quantitative food records. Macronutrient intake is implicated in grams per day or kilograms of body weight and showed variations across studies. The protein intake varied from 1.1 to 3.4 g/kg.bw/d while carbohydrate intake differed from 2.4 to 4.6 g/kg.bw/d. Daily recommended carbohydrate intake for sports nutrition ranges between 3 g and 12 g/kg.bw/d whereas the protein intake ranges from 1.2 to 2.0g/kg.bw/d[39,43,45,46,47,48,49.] In the seven studies mean fiber intakes ranged from 15 g/day to 45.8g/day (43,47,48,49,50). Fat intake was found to vary with a range of between 0.9 and 1.6 g/kg.bw/d, with saturated fat makes up about 9-13% of total energy consumed[45,43,39,48,49]. Six studies examined the relationship between dietary ingestion and nutritional knowledge (NK); these revealed some associations. Among Australian soccer players, Andrews & Itsiopoulos observed that there was a moderate positive correlation of sports NK with mean energy intake r = .31 P=.04 as well as carbohydrate intake (r = .35 P=.02)[47] Argolo et al identified a negative correlation between total NK and sodium intake(r=-0.485, P<0.05) among Brazilian adult table tennis players[49.] there was a weak but statistically significant sport NK positive correlation with both total energy expenditure and height in Australian footballers and soccer players – unrelated to total NK – energy and carbohydrate intake r 2 = 0.046, P = 0.014 and r 2 = 0.043, P = 0.039, respectively [45]. Furthermore, general and sports NK scores in elite Australian football players had a medium-large, statistically significant negative correlation unrelated to total protein intake r 2 = 0.244, P = 0.026 and r 2 = 0.382, P = 0.016, respectively.[43]

A negative correlation was found among American student-athletes between NK scores on dietary recommendations and the consumption of caffeine-based energy drinks: r = −0.48; P < .001. By contrast, a positive association was indicated for Australian football players' NK scores and the percentage of estimated energy requirements met from EA: r = 0.325; P = 0.031 and positive correlations were found for protein, fibre, and calcium intake: r = 0.348; P = 0.021; r = 0.510; P = 0.001; r = 0.428; P = 0.004, respectively.[43]

Studies indicate that several athletes fail to meet the minimum requirements to pass an NK test, suggesting their ignorance of both common and athletic-oriented dietary recommendations. For the studies selectively filtrating one passing criterion for optimum NK scores, only average NK was observed pitted against the others who had poor NK levels. The lack of benchmarking makes it challenging to assess the significance of these results, but the percentages appear low, indicating potential knowledge gaps in athletes. Nutrition factors which include coaches and trainers who undervalue their role in the field of nutrition, as well as team nutrition experts who do a weak job of passing the relevant educational information to the athletes, are some of the causes of athletes' undernutrition[20] Dietary carbohydrate intake in athletes is frequently lower or just enough in contrast to protein intake which often is greater than the recommendations, a reason for this might be that some trendy athletes mention protein intake a lot or they have specific goals that Athletes may be consuming more of certain nutrients such as protein by adhering to certain diets or working towards specific goals that may emphasize these nutrients. This association indicates players with top NK will most probably consider having natural diet tendencies. Nevertheless, there is a vast discrepancy in the outcomes of NK measurement, and many researchers use antiquated or invalid versions of measurement modalities. As those dietary assessment methods in athletes are profoundly divergent, they may neglect features specific to this particular team[35,43,45]. A systematic review of the research is very important; however, an update was required to check the validity of previous findings, especially those relating the NK and dietary habits. Overall, integrating NK in athletes could serve as a motivational factor resulting in better food choices and ultimate performance, stressing the necessity of the portfolio of performance augmenting nutrition education programs for this community.

Conclusion

A vital aspect of athletic performance is nutrition. Athletes may better feed their bodies, maximise training adaptations, and improve their overall performance by understanding the importance of macronutrients, micronutrients, hydration, and nutrition periodization. Athletes may reach their maximum potential and excel in their particular sports by giving healthy nutrition priority.Measurement tools used for assessing the nutritional knowledge were inadequately validated therefore it is difficult to be certain of the current status of nutrition knowledge. There are so many factors which influence nutrition knowledge such as traditional differences, passion to follow a nutritious diet, knowledge about the diet suitable for sportsmen and money. There is a need for large population research with the help of validated tools to investigate nutrition knowledge and its relation or impact on dietary intake.

Conflict of Interest: Nil

Source of Funding: Self-None

Ethical Clearance: Nil

Refrences

1. Labban L. Nutritional knowledge assessment of Syrian university students. Journal of the scientific society. 2015 May 1;42(2):71-7.
2. Birkenhead KL, Slater G. A review of factors influencing athletes' food choices. Sports medicine. 2015 Nov;45:1511-22.
3. Alaunyte I, Perry JL, Aubrey T. Nutritional knowledge and eating habits of professional rugby league players: does knowledge translate into practice?. Journal of the International Society of Sports Nutrition. 2015 Apr 17;12(1):18.
4. Escott-Stump S, Mahan LK, editors. Krause's food, nutrition, & diet therapy. WB Saunders; 2000.
5. Rossi FE, Landreth A, Beam S, Jones T, Norton L, Cholewa JM. The effects of a sports nutrition education intervention on nutritional status, sport nutrition knowledge, body composition, and performance during off season training in NCAA Division I baseball

players. Journal of sports science & medicine. 2017 Mar;16(1):60.

6. Jacobson BH, Sobonya C, Ransone J. Nutrition practices and knowledge of college varsity athletes: a follow-up. The Journal of Strength & Conditioning Research. 2001 Feb 1;15(1):63-8.
7. Rosenbloom CA, Jonnalagadda SS, Skinner R. Nutrition knowledge of collegiate athletes in a Division I National Collegiate Athletic Association institution. Journal of the Academy of Nutrition and Dietetics. 2002 Mar 1;102(3):418.
8. Zawila LG, Steib CS, Hoogenboom B. The female collegiate cross-country runner: nutritional knowledge and attitudes. Journal of athletic training. 2003 Jan;38(1):67.
9. Froiland K, Koszewski W, Hingst J, Kopecky L. Nutritional supplement use among college athletes and their sources of information. International journal of sport nutrition and exercise metabolism. 2004 Feb 1;14(1):104-20.
10. Kearney JM, McElhone S. Perceived barriers in trying to eat healthier–results of a pan-EU consumer attitudinal survey. British Journal of Nutrition. 1999 Jun;81(S1):S133-7.
11. Cotugna N, Vickery CE, McBee S. Sports nutrition for young athletes. The Journal of School Nursing. 2005 Dec;21(6):323-8.
12. Heaney S, O'Connor H, Naughton G, Gifford J. Towards an understanding of the barriers to good nutrition for elite athletes. International Journal of Sports Science & Coaching. 2008 Sep;3(3):391-401.
13. Ono M, Kennedy E, Reeves S, Cronin L. Nutrition and culture in professional football. A mixed method approach. Appetite. 2012 Feb 1;58(1):98-104.
14. Birkenhead KL, Slater G. A review of factors influencing athletes' food choices. Sports medicine. 2015 Nov;45:1511-22.
15. Torres-McGehee TM, Pritchett KL, Zippel D, Minton DM, Cellamare A, Sibilia M. Sports nutrition knowledge among collegiate athletes, coaches, athletic trainers, and strength and conditioning specialists. Journal of athletic training. 2012 Mar;47(2):205-11.
16. Devlin BL, Belski R. Exploring general and sports nutrition and food knowledge in elite male Australian athletes. International journal of sport nutrition and exercise metabolism. 2015 Jun 1;25(3):225-32.
17. Shifflett B, Timm C, Kahanov L. Understanding of athletes' nutritional needs among athletes, coaches, and athletic trainers. Research Quarterly for Exercise and Sport. 2002 Sep 1;73(3):357-62.
18. Azizi M, Rahmani-Nia F, Malaee M, Malaee M, Khosravi N. A study of nutritional knowledge and attitudes of elite college athletes in Iran. Brazilian Journal of Biomotricity. 2010;4(2):105-12.
19. Dunn D, Turner LW, Denny G. Nutrition knowledge and attitudes of college athletes. The Sport Journal. 2007 Sep 22;10(4):NA-.
20. Torres-McGehee TM, Pritchett KL, Zippel D, Minton DM, Cellamare A, Sibilia M. Sports nutrition knowledge among collegiate athletes, coaches, athletic trainers, and strength and conditioning specialists. Journal of athletic training. 2012 Mar 1;47(2):205-11.
21. Abood DA, Black DR, Birnbaum RD. Nutrition education intervention for college female athletes. Journal of nutrition education and behavior. 2004 May 1;36(3):135-9.
22. Condon EM, Dube KA, Herbold NH. The influence of the low-carbohydrate trend on collegiate athletes' knowledge, attitudes, and dietary intake of carbohydrates. Topics in Clinical Nutrition. 2007 Apr 1;22(2):175-84.
23. Rash CL, Malinauskas BM, Duffrin MW, Barber-Heidal K, Overton RF. Nutrition-related knowledge, attitude, and dietary intake of college track athletes. Sport Journal. 2008 Jan 1;11(1).
24. Weeden AM, Olsen J, Batacan JM, Peterson T. Differences in collegiate athlete nutrition knowledge as determined by athlete characteristics. The Sport Journal. 2014;17.
25. Werblow JA, Fox HM, Henneman AL. Nutritional knowledge, attitudes, and food patterns of women athletes. Journal of the American Dietetic Association. 1978 Sep 1;73(3):242-5.
26. Nichols PE, Jonnalagadda SS, Rosenbloom CA, Trinkaus M. Knowledge, attitudes, and behaviors regarding hydration and fluid replacement of collegiate athletes. International journal of sport nutrition and exercise metabolism. 2005 Oct 1;15(5):515-27.
27. Smith-Rockwell M, Nickols-Richardson SM, Thye FW. Nutrition knowledge, opinions, and practices of coaches and athletic trainers at a division 1 university. International journal of sport nutrition and exercise metabolism. 2001 Jun 1;11(2):174-85.
28. Barbaros-Tudor P, Radman I, Janković G. Nutritional knowledge and dietary habits of croatian tennis coaches. Proceedings Book. 2011 Sep 8:102.

29. Botsis AE, Holden SL. Nutritional knowledge of college coaches. Sport Sci. Rev. 2015 Aug 1;24:193-200.
30. Danaher K, Curley T. Nutrition knowledge and practices of varsity coaches at a Canadian university. Canadian Journal of Dietetic Practice and Research. 2014 Nov 20;75(4):210-3.
31. Trakman GL, Forsyth A, Hoye R, Belski R. The nutrition for sport knowledge questionnaire (NSKQ): development and validation using classical test theory and Rasch analysis. Journal of the International Society of Sports Nutrition. 2017 Dec;14:1-1.
32. Zinn C, Schofield G, Wall C. Development of a psychometrically valid and reliable sports nutrition knowledge questionnaire. Journal of science and medicine in sport. 2005 Aug 1;8(3):346-51.
33. Nascimento M, Silva D, Ribeiro S, Nunes M, Almeida M, Mendes-Netto R. Effect of a nutritional intervention in athlete's body composition, eating behaviour and nutritional knowledge: A comparison between adults and adolescents. Nutrients. 2016 Sep 7;8(9):535.
34. Coccia C, Fernandes SM, Altiti J. Tweeting for nutrition: feasibility and efficacy outcomes of a 6-week social media-based nutrition education intervention for student-athletes. The Journal of Strength & Conditioning Research. 2020 Jul 1;34(7):2084-92.
35. Parmenter K, Wardle J. Development of a general nutrition knowledge questionnaire for adults. European journal of clinical nutrition. 1999 Apr;53(4):298-308.
36. Mitchell BA, Holden SL, Forester BE, Gurchiek LR, Heitman RJ. Nutritional Education Intervention and the Effects on Nutritional Knowledge of Male College Athletes. Applied Research in Coaching & Athletics Annual. 2016 May 1;31.
37. Hardy R, Kliemann N, Evansen T, Brand J. Relationship between energy drink consumption and nutrition knowledge in student-athletes. Journal of nutrition education and behavior. 2017 Jan 1;49(1):19-26.
38. Lohman R, Carr A, Condo D. Nutritional intake in Australian football players: Sports nutrition knowledge and macronutrient and micronutrient intake. International journal of sport nutrition and exercise metabolism. 2019 May 1;29(3):289-96.
39. Condo D, Lohman R, Kelly M, Carr A. Nutritional intake, sports nutrition knowledge and energy availability in female Australian rules football players. Nutrients. 2019 Apr 28;11(5):971.
40. Leite MD, Machado AC, Silva DD, Raposo OF, Netto RS. Nutritional knowledge after conducting nutritional education activities between children and adolescents sports people.
41. Magee PJ, Gallagher AM, McCormack JM. High prevalence of dehydration and inadequate nutritional knowledge among university and club level athletes. International journal of sport nutrition and exercise metabolism. 2017 Apr 1;27(2):158-68.
42. Madrigal L, Wilson PB, Burnfield JM. Nutritional Regrets and Knowledge in National Collegiate Athletic AssociationDivision I Athletes: Establishing a Foundation for Educational Interventions. Journal of Issues in Intercollegiate Athletics. 2016;9(1):11.
43. Jenner SL, Trakman G, Coutts A, Kempton T, Ryan S, Forsyth A, Belski R. Dietary intake of professional Australian football athletes surrounding body composition assessment. Journal of the International Society of Sports Nutrition. 2018 Dec;15:1-8.
44. Holden SL, Forester BE, Smith AL, Keshock CM, Williford HN. Nutritional knowledge of collegiate athletes. Applied Research in Coaching and Athletics Annual. 2018;33:65-77.
45. Devlin BL, Leveritt MD, Kingsley M, Belski R. Dietary intake, body composition, and nutrition knowledge of Australian football and soccer players: Implications for sports nutrition professionals in practice. International journal of sport nutrition and exercise metabolism. 2017 Apr 1;27(2):130-8.
46. Jenner SL, Devlin BL, Forsyth AK, Belski R. Assessing the nutrition knowledge of professional female Australian football (AFLW) athletes. Science and Medicine in Football. 2020 Jul 2;4(3):240-5.
47. Andrews MC, Itsiopoulos C. Room for improvement in nutrition knowledge and dietary intake of male football (soccer) players in Australia. International journal of sport nutrition and exercise metabolism. 2016 Feb 1;26(1):55-64.
48. McCrink CM, McSorley EM, Grant K, McNeilly AM, Magee PJ. An investigation of dietary intake, nutrition knowledge and hydration status of Gaelic Football players. European journal of nutrition. 2021 Apr;60:1465-73.
49. Argôlo D, Borges J, Cavalcante A, Silva G, Maia S, Ramos A, Oliveira E, Nascimento MV. Poor dietary intake and low nutritional knowledge in adolescent and adult competitive athletes: a warning to table tennis players. Nutriciónhospitalaria: Organo oficial de la Sociedad española de nutrición parenteral y enteral. 2018;35(5):1124-30.
50. Abbey EL, Wright CJ, Kirkpatrick CM. Nutrition practices and knowledge among NCAA Division III football players. Journal of the International Society of Sports Nutrition. 2017 Dec;14:1-9.