

The Evaluation Study of Nutritional Knowledge from Sports Practitioners in The Quadrennial National Sports Competition 2021

Mohammad Arif Ali^{1*}, Gustiana Mega Anggita¹, Said Junaidi¹, Sugiarto Sugiarto¹, Siti Baitul Mukarromah¹, Dewi Marfu'ah Kurniawati², Etika Ratna Noer², Zainudin Amali³, Donny Wira Yudha Kusuma⁴, Leo Nacion Santillana⁵, Anggit Wicaksono⁶, Adiska Rani Ditya Candra⁶

ABSTRACT

Background: Nutritional program is another influencing factor of athletic performance after the physical training program, and psychological training program. However, Indonesian sports practitioners somehow still neglect the important role of sports nutrition to achieve the best athletic performance.

Objectives: To examine the level of basic nutritional and sports nutritional knowledge among the sport's practitioners who participated in the quadrennial national sports competition 2021.

Materials and Methods: This evaluation study has conducted with a descriptive quantitative approach. Thirty-eight sports practitioners (24 males and 14 females), were represented from five provinces such as Central Java, Western Java, Eastern Java, Southern Sumatera, and Bali. Their status during the sports events are athletes, referees, officials, coaches, and judges. The incidental technique sampling was used to attract the respondents. Nutritional Knowledge Questionnaires (NKQ) developed by Rosi et al, was used in this study. Data was analyzed with the frequencies distribution technique, and displayed using the percentage.

Results: More than half of the total respondents (81%) have good, very good, and excellent knowledge in general nutrition (21%, 34%, 26%) respectively. Similarly, it is also happened in the evaluation of their knowledge for basic nutrition good (5%), very good (29%), excellent (40%), as well as in their knowledge levels for sports nutrition, good 18% and excellent 53%. However, based on the evaluation of their sports nutritional knowledge, we found that there are 8% (n=3) of the respondent were failed as the score <50 points.

Conclusion: Overall, the nutritional knowledge for general, basic and sports in sports practitioners evaluated good. However, the sports nutritional knowledge is not well understood evenly by them. At last, this study can be used as a reference to make a better decision on how sports nutrition must be promoted to maximize the athletic performance.

Keywords: Sports Nutrition; Sports Event; Elite Sports

BACKGROUND

The proper physical training program, diet program, and psychological training are believed to be the key factors which affecting the best sports performance for any athlete. Further, social support, family, coach, teammates, athletic ability, athletic experience, and athletic achievements are considered as the contributing factors to either good or poor performance.¹ Aspects involved in a training program such as performance prediction, periodization, training methods and monitoring, techniques, injury prevention and its management.² Meanwhile, adequacy, balance, calorie (energy) control, nutrient density, moderation, variety, and consumption time are the aspects involved in the diet program.³ Last, the psychological aspects such as

¹Department of Sports Science, Faculty of Sports Science, Universitas Negeri Semarang Gedung F1, Kampus Sekaran, Gunungpati, Semarang, Jawa Tengah 50229, Indonesia

²Department of Nutrition Science, Faculty of Medicine, Universitas Diponegoro Jl. Prof. Sudarto SH, Tembalang, Semarang, Jawa Tengah 50275, Indonesia

³Ministry of Youth and Sports, Republic of Indonesia Jl. Gerbang Pemuda No. 3 Senayan, Tanah Abang, Jakarta Pusat 10270, Indonesia

⁴Department of Physical Education, Faculty of Sports Science, Universitas Negeri Semarang Gedung F1, Kampus Sekaran, Gunungpati, Semarang, Jawa Tengah 50229, Indonesia

⁵Department of Physical Education, College of Education, Mindanao State University – Iligan Institute of Technology Andres Bonifacio Ave, Iligan City, 9200 Lanao del Norte, Republic of the Philippines

⁶Department of Sports Coaching and Education, Faculty of Sports Science, Universitas Negeri Semarang Gedung F1, Kampus Sekaran, Gunungpati, Semarang, Jawa Tengah 50229, Indonesia

*Correspondence : hiarifalikh@mail.unnes.ac.id

attention, self-confidence, stress control, anxiety, motivation, cohesion, self-control or emotional self-regulation, moods, and interpersonal skills can influence the athlete's performance.⁴

Educational factors such as formal education and informal education in some ways could be one of many determinant factors on human behavior. A study found that there were not any differences on nutritional knowledge and attitudes among elite athletes, amateur athletes, and recreational athletes.⁵ Interestingly, there are two scientific evidences about the correlation between nutritional knowledge and sports that were not in line with each other. The first study stated that having a good nutritional knowledge or its practice did not directly determine the athletic performance, and the other study stated that body fat percentage (BF%) was found higher in athletes who have a low level of sports nutrition knowledge.^{6,7}

In elite sports, a study analyzed the tennis players' knowledge and attitudes on sports nutrition and doping revealed that coach (teacher, mentor) becomes their main source of any information related to doping and nutrition.⁸ Hence, consistent long-term educational intervention is able to change the knowledge, attitudes, and athletes' behavior on sports nutrition. Athletes are motivated to learn, improve diet behaviors, and benefit from team-based nutrition interventions.⁹ Both basic nutritional concepts and the understanding of specific effects of nutrients on sports performance still needed to be consistently taught to the athlete by the sports nutrition practitioners. Unclear understanding of nutritional guidelines interpreted into absolute food portions or combinations may found in the athlete. Nutritional interventions by promoting adequate energy intake, lowering BF%, appropriately gaining muscle mass, and the body lean is still needed.^{6,7}

Based on the elucidation above, the levels of nutritional knowledge in sports practitioners either athlete, coach, official, or other stakeholders is remains unclear. Therefore, this study aims to evaluate the level of sports practitioners' knowledge on both basic nutrition and sports nutrition.

MATERIALS AND METHODS

This evaluation study has conducted with a descriptive quantitative approach. The inclusion criteria in this study is all the individuals who were actively participating in the quadrennial national sports competition 2021, Papua. Their status during the sports events are athletes, referees, officials, coaches, and judges. Meanwhile, total respondents in this study are 38 sports practitioners (24 males and 14 females), they were represented from five provinces such as Central Java, Western Java, Eastern Java, Southern Sumatera, and Bali. The incidental technique sampling was used to attract the response.

Nutritional Knowledge Questionnaires (NKQ) developed by Rosi et al, which published in 2020 was used in this study, it was translated into Bahasa Indonesia, with some adjustments on its statements and then it was transferred into Google Forms to make easier distribution and data collection. The NKQ consisted of 16 questions evaluating basic nutrition, and 10 questions evaluating sports nutrition. The NKQ was chosen because it provides a brief, feasible, and validated questionnaire or evaluates the efficacy of education on basic and sports nutrition in both the general population and athletes.¹⁰

NKQ using the modified Goodman Scales which provides three optional answers (true/false/I do not know). The six-teen questions related to basic nutritional knowledge are: 1) Protein intake and body fat, 2) Carbohydrate content of banana, 3) Carbohydrate content of rice, 4) Fat requirements, 5) Fat content of low-fat cheese, 6) Fat content of butter, 7) Fat content of honey, 8) Daily recommended intake of water, 9) Protein content of hard cheese, 10) Protein content of beans, 11) Protein content of corn, 12) Protein quality of eggs, 13) Energy from vitamins, 14) Daily recommended calcium intake, 15) Alcohol and body fat, and 16) Alcohol intake and recovery from injuries. Meanwhile, the ten questions related to sports nutritional knowledge are: 1) The best meal for increasing muscle mass, 2) Protein needs of vegetarian athletes, 3) Vitamin and mineral supplements and sports performance, 4) Water consumption during training, 5) Dehydration and sports performance, 6) Snacking during training, 7) Carbohydrate intake during training, 8) Label and claims on food supplements, 9) Safety of supplements, and 10) Doping substances.

The answers of NKQ were scored. Then it was categorized into eight categories such as Failed <50, Less 51-55, Less than enough 56-60, Enough 61-65, More than enough 66-70, Good 71-80, Very good 81-85, and excellent 86-100.¹⁰ Data were analyzed with the frequencies distribution technique, and displayed using the percentage in the tables and figures.

RESULTS

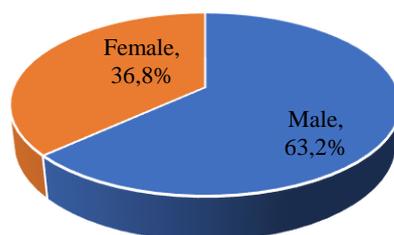


Figure 1. Respondent's Sex

A total of 38 respondents participated in this study which consists of 24 (63.2%) males and 14 (36.8%) females (Figure 1). The educational backgrounds of respondents were varied starting from Junior High School 3 (7.9%), Senior High School 10 (26.30%), Bachelor Degree 18 (47.40%), Master Degree 4 (10.50%), and Doctoral Degree 3 (7.9%), for the visualization can be seen on Figure 2.

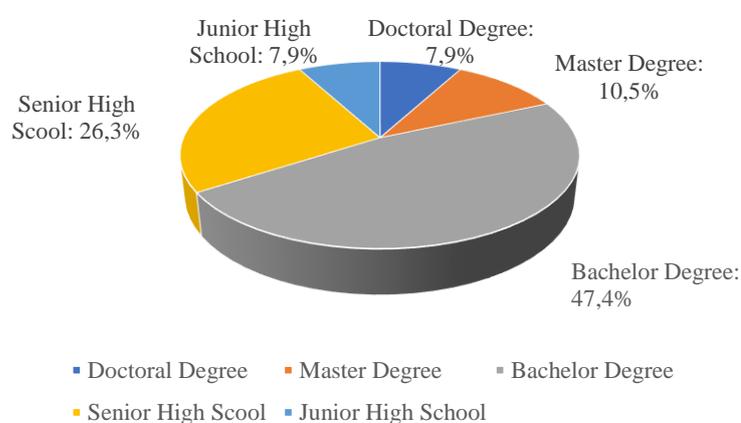


Figure 2. Educational Degree of Respondent

Table 1. Participants Delegation

Category	n	%
Province		
Central Java	21	55.28
Western Java	8	21.05
Eastern Java	3	7.89
Southern Sumatera	3	7.89
Bali	1	2.63
Unknown	2	5.26
Sports		
Gymnastics	18	47.40
Handball	4	10.52
Softball	3	7.89
Wrestling	2	5.26
6t5 Skates	2	5.26
Sepak Takraw	2	5.26
Wushu	2	5.26
Cricket	1	2.63
Indoor Hockey	1	2.63
Hapkido	1	2.63
Archery	1	2.63
Unknown	1	2.63
Status		
Athlete	28	73.70
Referee	5	13.15
Official	3	7.89
Coach	1	2.63
Judge	1	2.63

There are five identified provinces that have participated in this study: Central Java (55.28%), Western Java (21.05%), Eastern Java (7.89%), Southern Sumatera (7.89%), Bali (2.69%), and 2 respondents (5.26%) were not identified. Further, from those 5 provinces, the respondents were identified actively involved in 11 sports, they are: gymnastics (47.40%), handball (10.52%), 3 softball (7.89%), wrestling (5.26%), skates (5.26%), sepak takraw (5.26%), wushu (5.26%), cricket (2.63%), indoor hockey (2.63%), hapkido (2.63%), archery (2.63%), and one respondent (2.63%) was not identified. At last, from 38 respondents their role in the quadrennial national sports competition 2021 were as athlete (73.70%), referee (13.15%), official (7.89%), coach (2.63%), and judge (2.63%) see Table 1.

Nutritional knowledge is the overall knowledge, both about basic and sports nutrition. The data from sports practitioners can be seen in Table 2. Eight categories were made up based on the common judgmental value for the educational sector. Based on the analysis, regarding the nutritional knowledge found that 10 (26%) respondents are classified into excellent category, 13 (34%) very good, 8 (21%) good, 3 (8%) more than enough, 1 (3%) enough, less than enough 2 (5%) and less 1 (3%). Meanwhile, the understanding data of basic nutrition from respondents found that 15 (40%) were classified into excellent category, 11 (29%) very good, 2 (5%) good, 2 (5%) more than enough, 6 (16%) enough, and 2 (5%) less than enough. Lastly, the nutritional knowledge data of respondents showed that 20 (53%) were classified into excellent category, 7 (18%) good, 5 (13%) more than enough, 3 (8%) less than enough, and unfortunately 3 (8%) of respondents were failed.

Table 2. Distribution Frequency of Nutritional Knowledge

Category	Score Range	General Nutrition (n= 38)	Percentage (%)	Basic Nutriti (n= 38)	Percentage (%)	Sports Nutrition (n= 38)	Percentage (%)
Excellent	86-100	10	26	15	40	20	53
Very Good	81-85	13	34	11	29	0	0
Good	71-80	8	21	2	5	7	18
More than enough	66-70	3	8	2	5	5	13
Enough	61-65	1	3	6	16	0	0
Less than enough	56-60	2	5	2	5	3	8
Less	51-55	1	3	0	0	0	0
Failed	<50	0	0	0	0	3	8
Total		38	100%	38	100%	38	100%

Regarding to the sports nutritional data in table 2, although more than half of respondents were categorized into good (18%) and excellent (53%), surprisingly we found that there were three of the respondents failed as their score <50. These respondents backgrounds are three males; senior high school, senior high school, bachelor degree; one from eastern java, and two from western java; one sepak takraw athlete, and two gymnasts; one of them has been participating in sports for more than sixteen years, while the other two over than six years.

DISCUSSION

Based on this research, the majority of the respondent was male athletes. The gender gap in sports performance has been stable since years ago. These suggest that women's performances at the high level will never match those of men, even when performances still improve, these progressions are proportional for each gender.¹¹ In general, males have longer limb levers, stronger bones, greater muscle mass and strength, and greater aerobic capacity. Females exhibit less muscle fatigability and faster recovery during endurance exercise.¹²

The educational backgrounds of the respondent also varied from Junior High School to Doctoral Degree. Educational factors such as formal education and informal education in some ways could be one of many determinant factors on human behavior.⁵ A systematic literature review found that most nutrition education programs administered to athletes lead to significant improvements in nutrition knowledge (NK).¹³

The sports practitioner that become our respondents were from 5 different provinces in Indonesia. The quadrennial national sports competition is a multi-sport event held every four years in Indonesia. The

participants of this event are athletes from all provinces of Indonesia. It is organized by the National Sports Committee of Indonesia (KONI). The characteristic of the respondent was varied either the type of sports or the status of the sport's practitioners. Social support, family, coach, teammates, athletic ability, athletic experience, and athletic achievements are considered as the contributing factors to either good or poor performance.¹

In this research, general nutrition is the overall knowledge, both about basic and sports nutrition. Subjects who have a good knowledge were from higher educational background. Higher levels of nutrition knowledge have been reported in those with higher education or socio-economic status and greater levels of nutrition knowledge have been typically found in middle-aged as opposed to younger or older persons.¹⁴ Good nutritional knowledge has been recognized as the key factor that play a critical role in improving athletic performance in terms of improved quality of training and a speedy recovery from exercise. Athletes need sufficient knowledge of this subject to understand the importance of food choices for their athletic performance, recovery, and overall health.¹⁵

The question about basic nutrition is mostly about the source of macronutrients in food. From the result, we have found that the nutrition knowledge of our respondents was satisfactory as more than half of the participants had good nutritional knowledge. Magazines, parents, coaches, and teammates were the commonly cited sources for nutrition revealed by another study.⁷ Athletes are understanding the important role that nutrition has in performance. One thing athletes often forget is that their dietary needs are much higher than those of the general population. Individual dietary requirements vary depending on the type of sport, the athlete's goals, body composition, training schedule, environment, and metabolism.¹⁶

Most of sports practitioner have scored above 71 for the sports nutrition questions which are categorized as good, very good, and excellent. Sports nutrition is a complex area of nutrition science and has emerged as an entire medical sub-specialty of its own.¹⁷ Sports nutrition focused on meeting the nutritional requirements for physical activity, optimizing the refueling process after physical exercise, and improving athletic performance in training and competitions, as well as promoting general health and well-being.¹⁸

Surprisingly we found that some sports practitioners were failed (score <50) in sports nutrition knowledge. These respondents backgrounds are three males; 2 of them are senior high school and bachelor degree; one from eastern java, and two from western java; one sepak takraw athlete, and two gymnasts; one of them has been participating in sports more than sixteen years, while the other two over than six years. This finding, however, was similar to findings of other studies in which researchers found female athletes to have significantly higher NK scores than their male counterparts.¹⁹ Adolescent athletes often rely on their coaches for nutrition guidance despite gaining brief information from their regular textbooks. Dependence on the internet search for proper diet and nutrition is growing, however, it's difficult to separate authentic information. Lack of proper training on diet and nutrition creates potential harm if the coaches and athletes are misinformed.²⁰ Proper nutrition knowledge and healthy dietary practices are important for adolescent athletes as well as for coaches.⁷

CONCLUSIONS

We conclude that the sport's practitioners have well understanding of basic and sports nutrition, but this phenomenon especially the sports nutrition is still not understood by the whole practitioners. From this point, we suggest that sustainable education both formal and informal related to sports nutrition must be conducted as endless efforts to support the national sports development by the whole practitioners (athletes, referees, officials, coaches, and judges).

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