IJPESS
Indonesian Journal of Physical Education and Sport Science
p-ISSN 2775-765X | e-ISSN 2776-0200
Volume 5, No. 1, March 2025 Page. 25-31
http://journal.unucirebon.ac.id/index.php ijpess

The Effectiveness of Infographic Nutrition Education Media on Improving Nutrition Knowledge related to Athlete Eating Arrangements

M.Dzikri Mubarok[1*], Linda Riski Sefrina[2], Milliyantri Elvandari[3]

[1,2,3]Department of Nutrition, Faculty of Health Sciences, Universitas Singaperbangsa Karawang, Indonesia.

*Corresponding Author: M.Dzikri Mubarok, email: 2210631220013@student.unsika.ac.id

Received: 27 November 2024, Approved: 7 January 2025, Published: 30 March 2025

Abstract

Study Purpose. The purpose of this study was to determine the increase in athletes‘ nutritional knowledge related to eating arrangements through nutrition education using printed infographic nutrition education media that contains material about eating arrangements for athletes and determine the effectiveness of the media used to increase athletes' knowledge.

Materials and Methods. This study used a quantitative approach with experimental research methods and quasi-experimental research types. Respondents of this study were 30 11-year-old soccer athletes with nutritional status categories based on Z-score (IMT/U).

Results. The result is that there is a significant increase in athletes‘ knowledge after the intervention (p=0.000), Based on the results of the analysis, there is an increase in the knowledge score from pre-test (50,83 ± 10,9) ke post-test (66,67 ± 8,2), that the infographic media used is effective to increase athletes' knowledge about good eating arrangements and nutrition for athletes.

Conclusion. There is an increase in nutritional knowledge related to eating arrangements in athletes after a nutrition education intervention with printed infographic media, so that the media used is proven effective for increasing athletes' knowledge related to eating arrangements. The limitations of this study are that the period of intervention is quite short and only reviews the increase in knowledge only at the time of the pre-test and post-test so that it is not effective to determine the long-term effects on the attitudes and behaviour of athletes. It is hoped that future research will carry out interventions in a long enough period of time and carry out continuous monitoring to see the long-term effects on athletes.

Keywords: Athlete, Nutrition, Sport, Meal Management

DOI: https://doi.org/10.52188/ijpess.v5i1.990

Introduction

Football is one of the aerobic endurance sports, which is a sport that involves and requires oxygen intake for optimal performance while playing so that football requires good

physical fitnes (Bryantara, 2017). Based on this, food intake with good quality and nutrition is needed to support physical fitness in athletes so that their performance is good.

Factors that influence athlete performance during competition include age, gender, nutritional status, genetic factors, and physical activity. According to (Penggalih et al., 2017) stated that 72.5% of physical fitness or athlete performance is influenced by training intensity and nutrient intake. Nutrient intake includes the consumption of macronutrients (carbohydrates, protein and fat), micronutrients (vitamins and minerals) and fluids (Noronha et al., 2020). This must be known and understood by athletes so that in this case nutritional knowledge also needs to be given to athletes to support their practice in exercising and good nutritional food intake for better playing performance. Good and correct eating habits require a combination of improved knowledge, attitudes and actions (Moitra et al., 2021). An athlete's nutritional knowledge affects the way the athlete chooses food, which also affects the athlete's eating habits and body condition (Martín-Rodríguez et al., 2024). Lack of nutritional knowledge or a misunderstanding of the nutritional benefits of certain foods can compromise an athlete's health and fitness (Sa'adah et al., 2023). This will certainly have an impact on lifestyle and nutritional intake, namely improper eating arrangements in athletes.

Improper eating arrangements can lead to serious nutritional problems, such as obesity and malnutrition, which in turn can affect the athlete's quality of life and future productivity (Bryantara, 2017). The development of a particular sport, such as a football school (SSB), is inseparable from the principles of sports in general, namely to develop achievements, it requires integrated, directed, and sustainable development that starts from a young age and includes learning and developing knowledge about sports nutrition, as well as appropriate training, which ensures proper nutrient intake (Atisar et al., 2024). Other studies have shown that athlete education can improve athletes' understanding of the fulfilment of fluid intake and balanced nutrition (Fithra Dieny et al., 2021).

Based on this description, a nutrition education intervention was carried out with infographic media about eating and nutrition arrangements for athletes who then saw an increase in athletes' nutritional knowledge through nutrition education using printed infographic nutrition education media containing material about eating arrangements for athletes.

Materials and Methods

Study participants

The respondents of this study were 30 11-year-old soccer athletes with nutritional status categories based on Z-score (IMT/U), the categories are (Undernutrition = -3 SD s.d <- 2 SD; Good nutrition = -2 SD s.d +1 SD; Overnutrition = +1 SD s.d +2 SD; Obesity = >+2 SD).

Study organization

This study uses a quantitative approach with experimental research methods and quasi-experimental research types. The instruments used in this study include a nutritional knowledge questionnaire about eating arrangements for athletes adopted from the thesis (Sasfiya Nidayanti, 2019). The nutrition knowledge questionnaire contains 20 questions with a score of 5 points for each number. The knowledge category is assessed by summing the scores of all questions and then multiplying by a value of 5 points to produce a final score with assessment categories (<50 = not good and >50 = good). The media used for nutrition education is a printed infographic that contains material about eating arrangements for athletes with proper and balanced nutrition to improve athlete performance. Data collection was conducted from August 2024 to October 2024. Data collection was carried out in stages, namely the first week of anthropometric measurements, then the pre-test was carried out and the provision of nutrition education media in the form of infographics and the last week was carried out post-test to see

the increase in nutritional knowledge after being given educational media along with explanations.

Statistical analysis

Data analysis was carried out with the help of data processing applications, namely SPSS v.25, normally distributed data, then a paired t-test was carried out ($p < 0.05$). The data that has been collected is tested for normality (Shapiro-Wilk), the results of the normality test are normally distributed data ($p > 0.05$), so to see the effectiveness of the media on increasing pre-post test knowledge, a comparative test is carried out (Paired t-test).

Results

Respondents in this study totalled 30 male adolescent athletes aged 11 years. The descriptive test results show the diverse nutritional status of respondents. The results can be seen in Table 1.

Table 1. Nutritional Status of Respondents

Variables	Amount	
	n	%
Nutrition Status		
Less	3	10
Good	19	63,33
More	0	0
Obesity	8	26,66
Total	30	100

Based on Table 1, it is known that most of the respondents in this study had good nutritional status (63.33%) but there were also respondents who had obese nutritional status (26.66%) and poor nutritional status (10%).

Table 2. Nutrition Knowledge of Athletes Pre-Post Intervention

Variables	*Pre-test*		*Post-test*	
	n	%	n	%
Nutrition Knowledge				
Good	20	66,7	30	100
Not good	10	33,3	0	0
Total	30	100	30	100

Based on Table 2 Athletes' knowledge of eating and nutrition before the intervention was mostly in the good category (66.7%) and the rest were in the bad category (33.3%). After the intervention, all respondents had nutritional knowledge in the good category (100%).

Table 3. Media Effectiveness on Athletes' Nutrition Knowledge

Knowledge	n	Mean ± SD	Min-Max	p-*value*
Pre-test	30	50,83 ± 10,9	30-70	0,000*
Post-test	30	66,67 ± 8,2	50-80	

* significant at p-*value* <0,05

Based on Table 3. nutrition education media in the form of infographics used is effective in increasing athletes' knowledge related to eating arrangements ($p < 0.05$). There is an increase in the average value from pre-test (50.83 ± 10.9) to post-test (66.67 ± 8.2).

Discussion

Providing interventions in the form of nutrition education with infographic media is effective for improving athletes' nutritional knowledge. The infographic media provided contains information about eating arrangements for athletes in three time divisions (before, during and after the match), designed with various colour elements to attract athletes' attention. This is because the athlete media used attracts attention and provides explanations that are easy to understand for 11-year-old athletes. According to (Bria et al., 2024) Complex and creative ideas should be used to display images in print media that appeal to the target group. According to research (BZ et al., 2024) also stated that the use of posters and other print media must be adjusted to the target because posters are less attractive financing and less effective in providing health education. So that the creation of infographics is adapted to 11-year-old athletes, full of pictures, colourful and eye-catching. In line with research (Agustin et al., 2018; Sari et al., 2023) that athletes experience increased knowledge as a result of providing education with nutrition education media. Athletes' awareness increases during training or competition and athletes also change the way athletes consume food and fluids (Afriani et al., 2022). Educational media is essential to support the success of the education process.

According to (Budiono et al., 2021), Athletes need ideal nutrition and health to perform effectively in training and competition. Good athlete results can be achieved through a combination of regular training and healthy nutrition (Sasmarianto et al., 2023). This is due to the fact that athletes are supposed to consume the same amount of energy that athletes expend while exercising, but not much attention is paid to regulating athletes' nutritional intake (Fithra Dieny et al., 2021).

The results of the questionnaire score to measure the level of basic knowledge about nutrition and eating arrangements in athletes showed the majority had a score >=50 with a good category, however, there were still athletes who had a category of knowledge level that was not good (<50). Previous studies state that coaches and parents provide more information to athletes which affects the level of nutritional knowledge in athletes (Hapsari et al., 2023). Based on this, nutrition education must be carried out so that the level of knowledge is evenly distributed and supports good eating and nutrition arrangements for athletes so that athlete performance is optimal.

Eating arrangements for athletes include the behaviour of athletes in choosing and determining foods that have good and balanced nutrition to produce sufficient energy in a period of time, namely before, during and after a match or training. According to literature studies (Zahra & Muhlisin, 2020) explains the timing of meals for athletes for good athlete performance. The time before training or competing athletes need to consume food (400 kcal) about 3-4 hours before training or competing with a high carbohydrate content and low fat and contains about 10-25% of calories from protein. This is an effort to eliminate hunger and avoid cramps due to delayed gastric emptying (Caruana Bonnici et al., 2019). The second time is the time during training or competition, eating arrangements at this time aim to maintain the energy needed so that the athlete's performance is stable. During training or competition, it is recommended that athletes consume electrolyte drinks containing carbohydrates with a sugar content of 6-8%, this is intended for rapid absorption and reuse for energy (Gracia et al., 2021). Furthermore, eating arrangements at the time after training or competition are carried out with the aim of supporting recovery, growth of athlete tissues after being broken down and replacing glycogen reserves that have been used during training or competition, so high-protein foods are given that are easily absorbed by the body (Caruana Bonnici et al., 2019).

Conclusion

There is an increase in nutritional knowledge related to meal management in athletes after a nutrition education intervention with printed infographic media. The printed infographic

media used proved effective for increasing athletes' knowledge related to meal management time for athletes. Further research is recommended to make more innovative nutrition education media, for example in the form of a game so that the target, especially athletes with the age category of children to early adolescents, are more interested in the material and easier to apply in everyday life. The next suggestion for athletes is that education be carried out in the long term so that it can further improve athletes' knowledge related to eating arrangements in athletes for optimal playing performance and achievement.

Acknowledgment

The researcher would like to thank all parties involved in this research

Conflict of interest

There is no conflict of interest in this study.

Reference

Afriani, Y., Sari, S. P., Ervira, D., Program, P., Gizi, S., Sarjana, P., Kesehatan, I., & Yogyakarta, R. (2022). Analisis Ahli Cakram Asupan Makan dan Cairan Atlet: Studi Awal Pengembangan Media Edukasi Atlet Remaja. *Jurnal Gizi*, *11*(2), 48–59. https://doi.org/10.26714/JG.11.2.2022.48-59

Agustin, Y., Indra, E. N., & Afriani, Y. (2018). Asupan protein dan somatotype pada atlet pencak silat di Pembinaan Atlet Berbakat Yogyakarta. *Ilmu Gizi Indonesia*, *1*(2), 120–126. https://doi.org/10.35842/ilgi.v1i2.37

Atisar, Lizar Alfansi, Slamet Widodo, & Muhartini Salim. (2024). Strategy for Coaching and Development of Sports Achievement Branches in Supporting the Successful Implementation of the National Sports Grand Design (Dbon) in Bengkulu Province. *International Journal Management and Economic*, *3*(2), 79–94. https://doi.org/10.56127/ijme.v3i2.1322

Bria, N. C., Gerakan, P., Membaca, L., Sekolah, D., Katolik, D., Pelaksanaan, W., Literasi, G., Di, M., Dasar, S., Witihama, K., Novinsia,), Bria, C., Silaban, D. I., Innosensia,), Ndiki Satu, E. I., Program,), & Komunikasi, S. I. (2024). Pelaksanaan Gerakan Literasi Membaca di Sekolah Dasar Katolik Witihama. *Jurnal Pengabdian Kepada Masyarakat Nusantara*, *6*(1), 67–74. https://doi.org/10.55338/JPKMN.V6I1.3750

Bryantara, O. F. (2017). Factors That are Associated to Physical Fitness (VO2 Max) of Football Athletes. *Jurnal Berkala Epidemiologi*, *4*(2), 237. https://doi.org/10.20473/jbe.v4i2.2016.237-249

Budiono, I., Setiawan, A., & Kurnia, A. R. (2021). The use of participatory action research to improve energy intake of the soccer athletes. *Jurnal Keolahragaan*, *9*(1), 75–85. https://doi.org/10.21831/JK.V9I1.33697

BZ, Z., Komariyah, E., Hidayah, D. N., & Astutik, A. (2024). Implementasi Literasi Sekolah melalui Gerakan 15 Menit Membaca dan Pembuatan Poster dalam Meningkatkan Percepatan Membaca di MI Nurul Mun'im Karanganyar Paiton Probolinggo. *Al-DYAS*, *3*(1), 19–32. https://doi.org/10.58578/ALDYAS.V3I1.2126

Caruana Bonnici, D., Greig, M., Akubat, I., Sparks, S. A., Bentley, D., & Mc Naughton, L. R. (2019). Nutrition in Soccer: A Brief Review of the Issues and Solutions. *Journal of Science in Sport and Exercise*, *1*(1), 3–12. https://doi.org/10.1007/s42978-019-0014-7

Fithra Dieny, F., Jauharany, F. F., Rahadiyanti, A., Fitranti, D. Y., Fahmy, A., Tsani, A., & Marfu'ah Kurniawati, D. (2021). Program asuhan gizi olahraga (PAGO) atlet sepatu roda sebagai strategi memperbaiki profil status gizi, biokimia dan kualitas asupan. *Jurnal Keolahragaan*, *9*(2), 148–158. https://doi.org/10.21831/JK.V9I2.34747

Gracia, O., Wijaya, M., Meiliana, M., & Lestari, Y. N. (2021). Pentingnya Pengetahuan Gizi

Untuk Asupan Makan Yang Optimal Pada Atlet Sepak Bola. *Nutrizione: Nutrition Research And Development Journal*, *1*(2), 22–33. https://doi.org/10.15294/NUTRIZIONE.V1I2.51832

Hapsari, M., Penggalih, S. T., Sofro, Z. M., Trisnantoro, L., Susila, E. N., Rahadian, B., Sujadi, D., Isnanta, R., Bactiar, N., Anugraheni, A. R., Budiarjo, T., Kesehatan, D. G., Kedokteran, F., Masyarakat, K., Universitas, K., Mada, G., Fisiologi, D. I., Manajemen, D., Kesehatan, K., … Kesehatan, T. (2023). Pengaruh edukasi gizi terhadap pengetahuan gizi atlet remaja di Indonesia. *Jurnal Gizi Klinik Indonesia*, *20*(1), 38–46. https://doi.org/10.22146/IJCN.79757

Martín-Rodríguez, A., Belinchón-deMiguel, P., Rubio-Zarapuz, A., Tornero-Aguilera, J. F., Martínez-Guardado, I., Villanueva-Tobaldo, C. V., & Clemente-Suárez, V. J. (2024). Advances in Understanding the Interplay between Dietary Practices, Body Composition, and Sports Performance in Athletes. *Nutrients*, *16*(4), 1–32. https://doi.org/10.3390/nu16040571

Moitra, P., Madan, J., & Verma, P. (2021). Impact of a behaviourally focused nutrition education intervention on attitudes and practices related to eating habits and activity levels in Indian adolescents. *Public Health Nutrition*, *24*(9), 2715–2726. https://doi.org/10.1017/S1368980021000203

Noronha, D. C., Santos, M. I. A. F., Santos, A. A., Corrente, L. G. A., Fernandes, R. K. N., Barreto, A. C. A., Santos, R. G. J., Santos, R. S., Gomes, L. P. S., & Nascimento, M. V. S. (2020). Nutrition Knowledge is Correlated with a Better Dietary Intake in Adolescent Soccer Players: A Cross-Sectional Study. *Journal of Nutrition and Metabolism*, *2020*. https://doi.org/10.1155/2020/3519781

Penggalih, M. H. S. T., Juffrie, M., Sudargo, T., & Sofro, Z. M. (2017). Correlation between dietary intake with anthropometry profile on youth football athlete in Indonesia. *Asian Journal of Clinical Nutrition*, *9*(1), 9–16. https://doi.org/10.3923/ajcn.2017.9.16

Sa'adah, U., Hardiansyah, A., & Darmuin, D. (2023). Hubungan Pengetahuan Gizi dan Asupan Zat Gizi Makro dengan Tingkat Kebugaran Jasmani Atlet Sepak Bola di SSB Ganesha Putra FC Purwodadi. *Jurnal Ilmu Gizi Indonesia (JIGZI)*, *4*(1). https://doi.org/10.57084/jigzi.v4i1.1026

Sari, E. F. N., Siregar, N. M., Sukiri, S., Susanti, D., Umar, F., Sirega, N. M., Sukiri, S., Susanti, D., & Umar, F. (2023). Sosialisasi Aplikasi Android sebagai Materi Ajar Gerak Dasar Lokomotor bagi Guru Pendidikan Jasmani Sekolah Dasar. *Bubungan Tinggi: Jurnal Pengabdian Masyarakat*, *5*(1), 14. https://doi.org/10.20527/btjpm.v5i1.6613

Sasfiya Nidayanti, S. N. (2019). *Fisik Terhadap Status Gizi Atlet Sepak Bola PS Kerinci Tahun 2018*.

Sasmarianto, Harisca, N., & Meera, N. (2023). Survey of Nutrition Knowledge Level and Consumption Patterns In Futsal Athletes. *Ijpess*, *3*(2), 220–228. https://doi.org/10.52188/ijpess.v3i2.441

Zahra, S., & Muhlisin, M.-. (2020). Nutrisi Bagi Atlet Remaja. *Jurnal Terapan Ilmu Keolahragaan*, *5*(1), 81–89. https://doi.org/10.17509/jtikor.v5i1.25097

Information about the authors:

M. Dzikri Mubarok: 2210631220013@student.unsika.ac.id, Department of Nutrition, Faculty of Health Sciences, Universitas Singaperbangsa Karawang, Indonesia.

Linda Riski Sefrina, SKM., M.Si.,: linda.riski@fkes.unsika.ac.id, https://orcid.org/0000-0002-3918-5378, Department of Nutrition, Faculty of Health Sciences, Universitas Singaperbangsa Karawang, Indonesia.

Milliyantri Elvandari, S.Gz., M.Si.,: milly.elvandari@fkes.unsika.ac.id, https://orcid.org/0000-0002-5167-2304, Department of Nutrition, Faculty of Health Sciences, Universitas Singaperbangsa Karawang, Indonesia.

Cite this article as: Mubarok, M. Dzikri *et al*. (2024). The Effectiveness of Infographic Nutrition Education Media on Improving Nutrition Knowledge related to Athlete Eating Arrangements. *Indonesian Journal of Physical Education and Sport Science (IJPESS)*, *5*(1), 25-31. https://doi.org/10.52188/ijpess.v5i1.990