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## **The Prevalence of Nutritional Knowledge Among Soccer Athletes Within Different Levels of Participant Status**

Harris Kamal Kamaruddin<sup>1\*</sup>, Nor Azrin Natasya Sabri<sup>1</sup>, Najmuddin Arief Nordin<sup>1</sup>,  
Siti Jameelah Japilus<sup>1</sup>, Masshera Jamaludin<sup>1</sup>, Noor Mastura Mohd Mujar<sup>2</sup>  
& Ahmad Fikri Mohd Kassim<sup>1</sup>

<sup>1</sup>*Faculty of Sport Science, Universiti Teknologi MARA, Perlis Branch,  
Arau Campus, Arau, Perlis, Malaysia*

<sup>2</sup>*Lifestyle Science Cluster, Advanced Medical and Dental Institute, Universiti Sains Malaysia,  
Bertam, Kepala Batas, Pulau Pinang, Malaysia*

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### **Abstract**

Nutrition knowledge of an athlete, as well as practice, is expected to influence an athlete's performance. Dietary awareness plays an important role in implementing optimal nutrition practices. The purpose of this study is to assess the prevalence of nutritional knowledge of soccer athletes ( $n = 95$ ; age  $21 \pm 1.742$ ; years of involvement  $9.72 \pm 1.674$ ) within difference level of participation (university vs club). Nutritional knowledge was assessed using a psychometrically validated and reliable questionnaire. Eighty-seven questions were used to assess the knowledge about nutrition which consist of 5 domains which are general nutrition, fluid, recovery, weight control and supplements. The questionnaire was given immediately before and after training. Repeated measure ANOVA revealed a significant difference in nutritional knowledge between university and club level athletes ( $p = 0.024$ ) with a mean score of  $0.461 \pm 0.116$  vs  $0.404 \pm 0.125$ , respectively. The nutrient and fluid domains shown were significantly higher in university with a mean score of  $0.516 \pm .097$  for nutrient and  $0.573 \pm 0.159$  for fluid, respectively. However, no significant difference in other nutritional domains ( $p < 0.05$ ). The findings of the study provide evidence that they have a significant implication of university involvement concerning their nutritional knowledge.

**Keywords:** nutrition; soccer; knowledge; fluid; supplement

### **INTRODUCTION**

A key element of optimum performance in sports is nutrition, with the evolving of sports nutrition in since and exercise rapidly (Beck, Thomson, Swift, & von Hurst, 2015). At the same time, exercise training has the biggest potential to increase the performance, a study by Jeukendrup and Martin (2001), showing an increase in 40 km cycling time trial performance of 32 to 42 and 55 to 84 seconds with the intake of carbohydrate-electrolyte drink. The nutrients important for the performance as a meal plan can help increase performance including improving the consumption of macronutrients, micronutrients, and fluids, including their composition and spacing throughout the day (Jeukendrup, 2014).

Knowledge of nutrition is one of the major elements affecting athletes' nutritional status (Heikkilä, Valve, Lehtovirta, & Fogelholm, 2018). Most of the previous research has stated that the

prevalence of energy metabolism and nutrients intake (Nascimento et al., 2016; Thomas, Erdman, & Burke, 2016; Thomas, Nelson, Harwood, & Neumark-Sztainer, 2012). Although, limited research has looked at the sport nutritional knowledge, attitude and values in sport (Patton-Lopez, Manore, Branscum, Meng, & Wong, 2018). A classic study by Perron & Endres (1985), described that high school female volleyball players were found to have better nutritional knowledge and positively related with a more encouraging attitude towards nutrition's, however, the food choice among these athletes was poor. Walsh, Cartwright, Corish, Sugrue & Wood-Martin (2011) also reported that 60 per cent of high school male rugby players have a low nutritional awareness of nutrients that needed to replace the energy through the competition but increasing in the consumption of alcohol and supplements. According to Manore, Patton-Lopez, Meng, & Wong, (2017), 45 per cent of the soccer players tend to have poor nutritional knowledge, lower than previously reported in the literature (typically >65%) (Cupisti, D'Alessandro, Castrogiovanni, Barale, & Morelli, 2016; Nascimento et al., 2016; Perron & Endres, 1985). The author added that female athletes were more likely not to eat their breakfast when compared to the male counterpart (Manore et al., 2017). However, the limitation of these study was the sample populations were adolescent athletes (14 to 18 years) which may be less exposed to physical, nutritional education/ sports nutritional information or less interested since they still learning the sports skill (Manore et al., 2017). Also, a more comprehensive study should examine the difference in sport nutritional knowledge based on different gender, sex, race or level of participant involvement.

Soccer is an extremely sporting competition that requires players to facing tremendous pressure to perform their best during the match. Nonetheless, when combining the feature plan, its exposes players to be considered about the physical and psychological stress. Soccer athletes remain alert of tactical tactics for a long period during the games, constantly adjusting to make changes in the opposition and other players (Carling & Dupont, 2011). Soccer is a very challenging activity with performers exerting tremendous force to perform at every game and giving their very best. Soccer athletes also necessary to make fast and precise choices that take this factor seriously and continuously remember to retrieve and to account for these factors, constantly retrieving and come out with the decision in an on in a dynamic environment (Coutts, 2016). Soccer also is the game where they should have the skill to consider any important attribute to the results, with athletes attaining a highest maximum speed of 85-4 per cent during the competition (Malone, Roe, Doran, Gabbett, & Collins, 2017).

Despite the reputation of soccer worldwide, little is known about the nutritional knowledge behaviours among these athletes. To increase the value and recognised the professional nutritional area could change, a good perception of established nutritional knowledge needed. Hence, the purpose of this study is to elucidate the prevalence of nutritional knowledge among soccer athletes and to determine if there is a difference in the level of participant status.

## **MATERIAL AND METHODS**

The study population was university and local club level soccer players in state of Perlis. The inclusion criteria were male soccer players who actively involved in regular training and competing in a soccer match at least once a week and understand the English language. We recruited 95 soccer players (university level, N = 50, club level, N = 45) via random sampling according to the criteria. The characteristic of the participants was shown in Table 1.

**Table 1.** Demographic Characteristic of Subjects

Characteristics	Mean $\pm$ SD
Age (year)	21.08 $\pm$ 1.742
Weight (kg)	60.73 $\pm$ 7.082
Height (m)	1.68 $\pm$ .534
Year of participation	9.72 $\pm$ 1.674

Note: Data was presented in mean  $\pm$  SD

The participants were briefed about the study's objective, and the informed consent process was conducted before testing. Participants were given a self-administered Sports Nutrition Questionnaire (Zinn, Schofield & Wall, 2005) in a hard copy before training or competition. They were allowed to ask the investigator but were not allowed to discuss with their counterpart. A 20 min time were given for the respondent to answer each question. Once completed, the questionnaire was collected, and the participants were allowed to continue their training/ competition. The ethical approval was obtained from Universiti Teknologi MARA Research Ethical Committee (REC) (600-UiTMPs (HEA/KPP/KK-5/2) Bil(25) following the Helsinki guidelines.

### Sport Nutrition Knowledge Questionnaire

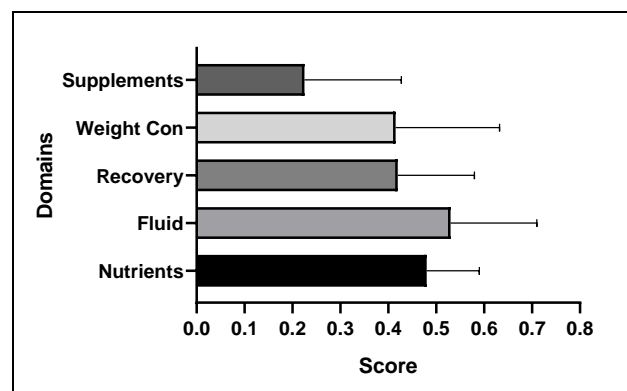
The nutritional knowledge was assessed using a psychometrically validated and reliable nutritional questionnaire (Zinn, Schofield & Wall, 2005). The questionnaire consisted of 87 questions that assessed knowledge (domains) of general nutrition (41 questions), fluid (9 questions), recovery (11 questions), weight control (15 questions) and supplements (11 questions). A correct response was scored as +1 and an incorrect/unsure response as 0. Two independent researchers were assigned to check the score for each response.

### Statistical Analysis

The statistical analysis was performed using SPSS (IBM, version 25). An  $\alpha$  level of 0.05 was set as significant for all statistical testing. Descriptive statistics (means and standard deviations and medians) were used to describe participant characteristics and their responses to the survey. Data were inspected visually and statistically (Kolmogorov–Smirnov statistic) for normality before analysis. To compare the nutrition knowledge between university and club level participants, an independent sample t-test was used to differential the total score. A two-way repeated ANOVA to examine the nutrition knowledge in domains between university and club level participants. When significant differences between treatments were identified, post hoc Student's *t*-tests using the Holm–Bonferroni adjustment were performed.

## RESULTS

The overall mean score in nutrition knowledge for the population was  $0.423 \pm 0.12$  (N = 95). Specifically, the overall score for each domain was shown in Figure 1. The fluid domain shows the highest score with  $0.53 \pm 0.18$ , while the supplements domain was the lowest score with  $0.23 \pm 0.20$ .



**Figure 1.** The means total score for the nutritional knowledge between domains. All the data were presented as mean  $\pm$  SD.

The mean total score for university level was  $0.4614 \pm 0.116$  for the total participant ( $n = 50$ ) and club level was  $.392 \pm .131$  for the total participant ( $n = 45$ ). There was a significant difference between overall knowledge of university and club  $F_{(1,93)} = 5.278, p = 0.024, \eta^2_p = 0.54$  (Table 2).

**Table 2.** The mean total score for overall nutritional knowledge of university and club level athletes.

Nutritional Knowledge		
University Level	$n = 50$	$0.443 \pm 0.133^*$
Club Level	$n = 45$	$0.392 \pm 0.131$

Note: Data was presented in mean  $\pm$  SD. \*Significance difference between university and club ( $p < 0.05$ ).

Furthermore, the post hoc analysis revealed that the score in the nutrient section ( $p = 0.001$ ) while fluid section ( $p = 0.014$ ) was significantly higher in university-level compare to those club level (Table 3). There is no significant difference between recovery, weight control and supplements between those two variables ( $p > 0.05$ ).

**Table 3.** Mean score for university and club level at different domains

Domain	<i>N</i>	University Level	Club Level	Significance
Nutrients	95	$0.516 \pm 0.097$	$0.439 \pm 0.125$	$0.001^*$
Fluid	95	$0.573 \pm 0.159$	$0.481 \pm 0.198$	$0.014^*$
Recovery	95	$0.438 \pm 0.176$	$0.408 \pm 0.137$	0.361
Weight control	95	$0.442 \pm 0.224$	$0.385 \pm 0.207$	0.200
Supplements	94	$0.336 \pm 0.198$	$0.31 \pm 0.21$	0.484

Note: Data was presented in mean  $\pm$  SD. \*Significance difference between nutrients and fluid domains ( $p < 0.05$ ).

## DISCUSSION

There is a narrow assessment of nutritional knowledge among university students, especially in different participant status levels. There is no research of university and club soccer athlete that directly discuss the nutritional knowledge. The main findings of this study revealed that this population had an average mean score of nutritional knowledge with 0.434. Despite average knowledge that they had, the population sample was still have not reached the good nutrition knowledge, compared to past results about soccer athletes who had an average nutritional knowledge (Magee et al., 2017). While the subjects had some misconceptions regarding nutrition, they were generally informed and optimistic in their nutritional attitudes (Perron & Endres, 1985).

Another previous study that supported that soccer athletes have an average knowledge is (Manore et al., 2017), the study also stated that their soccer athletes were in lower nutrition level in agreement with previous thought (Nascimento et al., 2016). The author explained that they might have less nutrition education experience or fewer understandings, as they continue to learn the sport's skills. Another research by (Cupisti, D'Alessandro, Castrogiovanni, Barale, & Morelli, 2002) revealed that adolescent athletes reported, and energy intake of nutritional knowledge was lower than estimated. These findings demonstrate that soccer athletes had average and lower knowledge compared to others team sports example like rugby which schoolboy rugby players had a good nutritional knowledge which correlates with positive dietary behaviours or attitudes (Walsh et al., 2011). Another study was from (Perron & Endres, 1985), the author highlight that the high school female volleyball players were found to have positive nutritional information with a more balanced attitude towards nutrition knowledge. We speculate that this average knowledge of the soccer athletes was not able to provide and answer the questionnaire correctly, and they do not focus on nutrition intake.

Nonetheless, this population reported an average knowledge about nutrition; there are very knowledgeable when it comes to the question about fluid knowledge. According to Wardle and

colleagues (2000), reported a connection between nutrition knowledge and nutrient as well as fluid rather than other groups. According to Cockburn (2014), when compared to fluids, weight control and supplements, their subject answered significantly more questions correctly in both the nutrients and recovery categories. Zinn and colleagues (2006) also found that premier club rugby coaches from New Zealand achieved the highest score in the nutrient's category followed by recovery, fluid, weight control and supplements. Similarly, Bedgood and Tuck, (1983) also found that their participants soccer coaches reached their highest score in the nutrient category. Furthermore, Rockwell (2001) illustrated that even though the coaches answered highest in the nutrient section (69.3%), only 40.9% of the coaches providing guidance.

Despite the score higher in nutrients domain, the participant scores lowest in the supplement's domain. According to Cockburn and colleagues (2014), only 15.1% of coaches assisted supplements because they scored worse in this section. Zinn and colleagues (2006) also revealed that their athletes have lacking knowledge about the supplements. The author added that supplements are the less answered of all the subcategories by the respondents. Similarly, Bedgood and Tuck, (1983) also reported that the soccer coaches scored lowest in the supplement's domain.

Furthermore, there was a significant difference between university and club level athletes. The result showed that university athletes score 0.433 in the mean score than club athletes which are 0.392 in a total mean score. This result showed the same as Rockwell and colleagues (2001), which the data has shown that these groups (collegiate) tend to have better nutrition knowledge than the general population. Also, collegiate athletes tend to have sufficient nutritional knowledge with an overall score of ~75% (Walsh et al., 2011). This finding can be supported by university involvement concerning their knowledge level when compare to club athletes. These findings demonstrate that university has the highest score slightly compare to club athletes.

The main limitation of this research study is small in sample size, and because of that, there is limited capacity and inadequate to identify the nutritional knowledge among university and club soccer athletes. Next, nutritional knowledge is assessed right after their training session, but it is hard to answer correctly due to fatigue after the training session. They might want to finish earlier, and they did not answer correctly. Maybe they need to rest for about one hour or take the day after they involve in a training session. So, this can also be affected by the score of nutritional knowledge.

In conclusion, these studies focused on nutritional knowledge among soccer athletes in different participant status levels. It understands the level of knowledge in order to increase their performance. The outcome has been shown that there is a significant difference between the nutritional knowledge of university soccer athletes and club soccer athletes. The participants overall nutritional awareness, derived from a wide range of sporting activities, was low.

## REFERENCES

- Beck, K., Thomson, J. S., Swift, R. J., & von Hurst, P. R. (2015). Role of nutrition in performance enhancement and postexercise recovery. *Open Access Journal of Sports Medicine*. Doi.org/10.2147/oajsm.s33605
- Bedgood, B. L., & Tuck, M. B. (1983). Nutrition knowledge of high school athletic coaches in Texas. *Journal of the American Dietetic Association*.
- Carling, C., & Dupont, G. (2011). Are declines in physical performance associated with a reduction in skill-related performance during professional soccer match-play? *Journal of Sports Sciences*. Doi.org/10.1080/02640414.2010.521945
- Cockburn, E., Fortune, A., Briggs, M., & Rumbold, P. (2014). Nutritional knowledge of UK coaches. *Nutrients*, 6(4), 1442–1453. <https://doi.org/10.3390/nu6041442>
- Coutts, A. J. (2016). Fatigue in football: it's not a brainless task! *Journal of Sports Sciences*, 34(14), 1296–1296. Doi.org/10.1080/02640414.2016.1170475
- Cupisti, A., D'Alessandro, C., Castrogiovanni, S., Barale, A., & Morelli, E. (2016). Nutrition knowledge and dietary composition in Italian adolescent female athletes and non-athletes. *International Journal of Sport Nutrition and Exercise Metabolism*. Doi.org/10.1123/ijsnem.12.2.207
- Heikkilä, M., Valve, R., Lehtovirta, M., & Fogelholm, M. (2018). Nutrition knowledge among young finnish endurance athletes and their coaches. *International Journal of Sport Nutrition and Exercise Metabolism*, 28(5), 522–527. Doi.org/10.1123/ijsnem.2017-0264



- Jeukendrup, A. (2014). A step towards personalized sports nutrition: Carbohydrate intake during exercise. *Sports Medicine*. Doi.org/10.1007/s40279-014-0148-z
- Jeukendrup, A. E., & Martin, J. (2001). Improving cycling performance: How should we spend our time and money. *Sports Medicine*. Doi.org/10.2165/00007256-200131070-00009
- Magee, P. J., Gallagher, A. M., & McCormack, J. M. (2017). High prevalence of dehydration and inadequate nutritional knowledge among university and club level athletes. *International Journal of Sport Nutrition and Exercise Metabolism*. Doi.org/10.1123/ijsnem.2016-0053
- Malone, S., Roe, M., Doran, D. A., Gabbett, T. J., & Collins, K. (2017). High chronic training loads and exposure to bouts of maximal velocity running reduce injury risk in elite Gaelic football. *Journal of Science and Medicine in Sport*, 20(3), 250–254. Doi.org/10.1016/j.jsams.2016.08.005
- Manore, M. M., Patton-Lopez, M. M., Meng, Y., & Wong, S. S. (2017). Sport nutrition knowledge, behaviors and beliefs of high school soccer players. *Nutrients*. Doi.org/10.3390/nu9040350
- Nascimento, M., Silva, D., Ribeiro, S., Nunes, M., Almeida, M., & Mendes-Netto, R. (2016). Effect of a nutritional intervention in athlete's body composition, eating behaviour and nutritional knowledge: A comparison between adults and adolescents. *Nutrients*, 8(9), 1–14. Doi.org/10.3390/nu8090535
- Patton-Lopez, M. M., Manore, M. M., Branscum, A., Meng, Y., & Wong, S. S. (2018). Changes in sport nutrition knowledge, attitudes/beliefs and behaviors following a two-year sport nutrition education and life-skills intervention among high school soccer players. *Nutrients*, 10(11), 1–22. Doi.org/10.3390/nu10111636
- Perron, M., & Endres, J. (1985). Knowledge, attitudes, and dietary practices of female athletes. *J Am Diet Assoc*.
- Rockwell, M. S., Nickols-Richardson, S. M., & Thye, F. W. (2001). Nutrition knowledge, opinions, and practices of coaches and athletic trainers at a Division I University. *International Journal of Sport Nutrition*. Doi.org/10.1123/ijsnem.11.2.174
- Thomas, D. T., Erdman, K. A., & Burke, L. M. (2016). Position of the Academy of Nutrition and Dietetics, Dietitians of Canada, and the American College of Sports Medicine: Nutrition and Athletic Performance. *Journal of the Academy of Nutrition and Dietetics*, 116(3), 501–528. Doi.org/10.1016/j.jand.2015.12.006
- Thomas, M., Nelson, T. F., Harwood, E., & Neumark-Sztainer, D. (2012). Exploring parent perceptions of the food environment in youth sport. *Journal of Nutrition Education and Behavior*, 44(4), 365–371. Doi.org/10.1016/j.jneb.2011.11.005
- Walsh, M., Cartwright, L., Corish, C., Sugrue, S., & Wood-Martin, R. (2011). The body composition, nutritional knowledge, attitudes, behaviors, and future education needs of senior schoolboy rugby players in Ireland. *International Journal of Sport Nutrition and Exercise Metabolism*.
- Wardle, J., Parmenter, K., & Waller, J. (2000). Nutrition knowledge and food intake. *Appetite*. Doi.org/10.1006/appe.1999.0311
- Zinn, Caryn, Schofield, G., & Wall, C. (2006). Evaluation of sports nutrition knowledge of New Zealand premier club rugby coaches. *International Journal of Sport Nutrition and Exercise Metabolism*. Doi.org/10.1123/ijsnem.16.2.214

✉ Harris Kamal Kamaruddin  
Universiti Teknologi MARA,  
Arau, Perlis, MALAYSIA  
Email: [harris540@uitm.edu.my](mailto:harris540@uitm.edu.my)