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A Quantitative Study of Nutritional Knowledge and Awareness Among Badminton Players at Club Champion Gading Jaya

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Abstract

Badminton is a high-intensity sport requiring physical endurance, speed, and rapid recovery, all of which are supported by proper nutrition. However, many athletes lack sufficient knowledge about their nutritional needs, which can negatively impact their performance. This study aims to evaluate the level of nutritional knowledge among badminton athletes at Club Champion Gading Jaya and to explore the relationship between this understanding and their performance. A quantitative descriptive research design was used, involving 22 athletes selected through total sampling. Data were collected using a validated multiple-choice questionnaire assessing knowledge of macronutrients, micronutrients, and dietary practices. Results show that only 13.6% of participants demonstrated a very good understanding of nutrition, while the majority were categorized as moderate or poor. Key deficiencies were observed in knowledge of micronutrients such as folic acid and iron, as well as balanced diet principles. Misconceptions, such as equating body weight with energy adequacy, were also prevalent. These findings highlight a critical gap in nutritional literacy among athletes. The study concludes that systematic, sport-specific nutrition education is urgently needed to improve dietary behaviors and enhance athlete performance. Targeted interventions by nutrition professionals are recommended as part of holistic athlete development strategies, not only to improve dietary behaviors but also to mitigate performance declines and health risks stemming from persistent nutritional misconceptions.

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INTRODUCTION

Badminton is one of the most physically demanding sports, requiring a unique combination of strength, speed, agility, and high endurance. Athletes are expected to maintain optimal physical condition during both intensive training and competitive matches (Ahady et al., 2024). To meet these physiological demands, it is essential not only to engage in structured training but also to support physical activity with a balanced and appropriate nutritional intake. Nutrition plays a critical role in enhancing performance, improving endurance, supporting muscle repair, and facilitating faster recovery. Moreover, proper dietary practices help reduce injury risk and sustain long-term consistency in athletic performance (Zahra & Muhlisin, 2020).

Despite the well-established importance of nutrition, many badminton athletes lack comprehensive knowledge of their nutritional needs, a condition observed even at professional levels (Alficandra et al., 2024). This gap in understanding often leads athletes to prioritize physical conditioning while neglecting dietary planning. A clear understanding of nutrition should include knowledge of macronutrients—carbohydrates as the main energy source for high-intensity movements, proteins for muscle recovery and growth, and fats as a supplementary fuel—as well as the function of micronutrients, which are essential in supporting immune function, oxygen transport, and metabolic processes (Wahyuningtyas et al., 2024). However, observations suggest that athletes often develop eating habits based on routine or misinformation rather than professional guidance (Marx et al., 2023).

The consequences of poor nutritional knowledge are significant and multifaceted (Zhao et al, 2022). Inadequate intake or misunderstanding of nutrient roles can lead to reduced stamina, diminished muscle strength, increased fatigue, and prolonged recovery time. These conditions not only affect short-term performance but also hinder long-term athletic development. In more severe cases, poor nutrition may contribute to chronic fatigue, digestive issues, or recurrent injuries, all of which limit an athlete's ability to train and compete at peak levels (Ahmad et al., 2024; Sosiawan, 2022). Such risks underscore the importance of accurate and sport-specific nutrition education as part of an integrated training strategy.

The underlying causes of this knowledge gap include limited access to professional dietitians, the tendency of coaches to focus primarily on physical and technical aspects of training, and the general lack of structured nutrition education within sports institutions (Dieny et al., 2021; Foo et al, 2021). The inability of many athletes to comprehend the physiological roles of nutrients, as reported by Amawi et al. (2024), compromises their potential for efficient energy use, metabolic optimization, and recovery. As a result, they are unable to translate physical training into consistent performance improvements.

While research on sports nutrition knowledge is growing, studies focusing specifically on badminton athletes remain scarce. Most existing research has examined general populations or athletes in other sports contexts, resulting in limited data connecting nutrition knowledge directly to badminton performance (Kurniawan et al., 2022). Some findings suggest that nutritional understanding correlates with educational background and sports experience, but further investigation is needed to contextualize these insights within badminton specifically (Rifalia et al., 2024).

Given these concerns, this study aims to evaluate the level of nutritional knowledge among badminton athletes and to examine how this understanding influences their performance during training and competition. The study focuses on athletes at Club Champion Gading Jaya, where initial observations revealed limited awareness of key nutrition principles, such as micronutrient functions and proper meal timing. Despite undergoing structured training, many athletes demonstrated irregular dietary habits and misconceptions regarding energy balance. These behaviors point to the absence of systematic nutrition education within the

club. Through a quantitative assessment, this study seeks to identify specific knowledge gaps and inform the development of targeted nutritional education strategies. Strengthening nutritional literacy is expected to improve not only athletes' dietary behaviors but also their physical endurance, injury resilience, and overall performance sustainability.

METHOD

Research Design

This study employed a quantitative descriptive research design to evaluate and describe the level of understanding of badminton athletes regarding key nutritional elements that influence athletic performance. The objective was to assess knowledge of essential components such as carbohydrates, proteins, fats, hydration, and overall balanced intake—all of which play crucial roles in supporting athletes' performance during training and competition.

Participants

The study involved 22 badminton athletes from Club Champion Gading Jaya. The sample was determined using total sampling, involving all athletes who met the inclusion criteria: actively training in preparation for competition during the study period. All participants were aged between 16 and 20 years, comprised both male and female athletes, and had educational backgrounds ranging from senior high school to undergraduate level. Most participants came from middle socioeconomic backgrounds and were proficient in standard Indonesian, which facilitated smooth communication during data collection. Additional characteristics such as training experience and level of competition were also considered relevant to contextualize the findings.

Instruments

The primary data collection tool was a 20-item multiple-choice questionnaire that assessed athletes' knowledge of sports nutrition, including the roles of macronutrients, micronutrients, hydration, and meal timing. Each question had two answer choices (true or false), and participants selected one correct answer. The questionnaire was adapted and validated from previous research by Wongkar et al. (2021), which demonstrated strong reliability and content validity for assessing nutritional knowledge among young athletes. Additional demographic information—such as age, gender, education level, and duration of training—was collected through a structured form.

Procedures

Data collection was conducted at the training facility of Club Champion Gading Jaya to ensure convenience and participant familiarity with the setting. After obtaining informed consent, the researcher distributed the questionnaires to all eligible athletes and provided standardized instructions. Participants completed the test under direct supervision to maintain consistency and address any questions. The process took approximately 30 minutes per group session. Completed responses were collected immediately to prevent discussion or outside influence.

Data Analysis

Data were analyzed using descriptive statistical methods to provide a clear overview of the athletes' nutritional knowledge. Calculations included frequencies, percentages, mean, median, mode, standard deviation, and percentiles. To interpret the results, the athletes' scores were converted into five categorical levels based on percentage ranges. Participants who scored between 86 and 100 percent were classified as having very good nutritional knowledge, while those scoring between 71 and 85 percent were categorized as good. Scores ranging from 56 to 70 percent were interpreted as moderate, those between 41 and 55 percent as poor, and scores of 40 percent or below indicated very poor knowledge. This classification allowed for structured and meaningful interpretation of the data across varying levels of comprehension.

RESULTS

Overview of Nutrional Knowledge

Table 1. Respondents' Answers on Nutritional Knowledge of Nutrients

No	Question	Answer	
		Correct	Incorrect
1	Consuming four slices of tempeh per day is sufficient to meet the daily protein requirements of adolescents.	6 (27.3%)	16 (72.7%)
2	Folic acid is abundantly found in green leafy vegetables and can help prevent polio.	4 (18.2%)	18 (81.8%)
3	Nutrients that are only required by the body consist of carbohydrates and fats.	20 (90.9%)	2 (9.1%)
4	Plant-based proteins are superior to animal-based proteins because they contain more complete amino acids.	9 (40.9%)	13 (59.1%)
5	Adequate consumption of fruits and vegetables does not play a role in the prevention of chronic diseases.	21 (95.4%)	1 (4.6%)

Based on Table 1, it can be seen that respondents have a good understanding of the importance of adequate fruit and vegetable consumption in the prevention of chronic diseases, as indicated by Question No. 5, with 95.4% answering correctly and 4.6% incorrectly. However, for Question No. 2, only 18.2% answered correctly while 81.8% answered incorrectly, indicating that the majority of respondents have a limited understanding of folic acid.

Table 2. Respondents' Answers on Nutrient Function Knowledge

No	Question	Answer	
		Correct	Incorrect
6	Odine is essential for the development of the brain and nervous system.	18 (81.8%)	4 (18.2%)
7	The function of food is to provide a feeling of fullness.	15 (68.2%)	7 (31.8%)
8	A person with a normal body weight is assumed to have met their energy requirements.	7 (31.8%)	15 (68.2%)
9	The functions of Vitamin A are divided into three categories: visual processes and general metabolism	16 (72.7%)	6 (27.3%)

Based on Table 2, it can be seen that respondents have a good understanding of the importance of iodine for brain and nerve development, as reflected in Question No. 6, with 81.8% answering correctly and 18.2% incorrectly. However, for Question No. 8, only 31.8% of respondents answered correctly while 68.2% answered incorrectly, indicating that the majority of respondents have a limited understanding of the statement that individuals with normal body weight have already fulfilled their energy requirements.

Table 3. Respondents' Answers on Balanced Nutrition Knowledge

No	Question	Answer	
		Correct	Incorrect
10	Fish consumption is more recommended than meat consumption.	13 (59.1%)	9 (40.9%)
11	Meat contains more cholesterol than fish.	19 (86.4%)	3 (13.6%)
12	Fruits are recommended to be consumed in greater quantities than vegetables.	12 (54.5%)	10 (45.5%)
13	A good daily vegetable intake is less than three servings.	9 (40.9%)	13 (59.1%)
14	The consumption of fish, eggs, and milk is highly beneficial for adolescents.	19 (86.4%)	3 (13.6%)
15	Nutritional status cannot be monitored through monthly body weight measurements.	10 (45.5%)	12 (54.5%)

Based on Table 3, it can be seen that respondents have a good understanding of the benefits of consuming fish, eggs, and milk for adolescents, as shown in Question No. 14, with 86.4% correct answers and 13.6% incorrect. However, for Question No. 13, only 40.9% of respondents answered correctly while 59.1% answered incorrectly, indicating that most respondents lack knowledge regarding the recommended daily servings of vegetables.

Based on Table 4, it can be seen that respondents have good knowledge regarding hypertension prevention by limiting salt intake to a maximum of one teaspoon per day, as reflected in Question No. 20, with 90.9% answering correctly and only 9.1% incorrectly. Conversely, for Question No. 16, only 27.3% answered correctly while 72.7% answered incorrectly, indicating that the majority of respondents still do not have a proper understanding of nutritional anemia and its causes.

Table 4. Respondents' Answers on Nutrition-Related Problems and Diseases

No	Question	Answer	
		Correct	Incorrect
16	Insufficient consumption of foods containing magnesium can cause anemia.	6 (27.3%)	16 (72.7%)
17	Diabetes mellitus and heart disease are associated with the consumption of fast food and salty, fatty foods.	14 (63.6%)	8 (36.4%)
18	Consuming fish can help in the prevention of osteoporosis.	15 (68.2%)	7 (31.8%)
19	Consuming foods high in purines, such as offal and crackers, can cause gout.	12 (54.5%)	10 (45.5%)
20	Hypertension can be prevented by limiting salt intake to a maximum of one teaspoon per day.	20 (90.9%)	2 (9.1%)

Table 5. Presents The Respondent Characteristics

Category	n	%
Very Good	3	13.6%
Good	4	18.2%
Moderate	11	50%
Less	3	13.6%
Very Poor	1	4.5%

Based on Table 5, it is shown that out of the 22 respondents surveyed, only 3 respondents (13.6%) demonstrated a very good level of knowledge, while 4 respondents (18.2%) were categorized as having good knowledge. A total of 11 respondents (50%) fell into the moderate category, 3 respondents (13.6%) were in the poor category, and 1 respondent (4.5%) was classified as having very poor knowledge.

DISCUSSION

This study aimed to assess the level of nutritional knowledge among badminton athletes at Club Champion Gading Jaya and examine how this knowledge may influence or reflect their athletic performance. The findings indicate that although there are areas in which athletes exhibit good knowledge—such as the importance of fruit and vegetable consumption in preventing chronic diseases (95.4% correct answers) and the role of iodine in brain and nerve development (81.8%)—there remain substantial gaps in understanding essential nutrient functions and dietary recommendations.

A striking result is the athletes' limited awareness of folic acid functions (only 18.2% answered correctly) and nutritional anemia (27.3% correct), suggesting that critical micronutrient knowledge is lacking. This is consistent with prior studies, such as those by Wahyuningtyas et al. (2024) and Dieny et al. (2021), which highlight that although athletes may be familiar with macronutrient intake (carbohydrates, proteins, fats), they often overlook or misunderstand the role of micronutrients like iron, folate, and iodine. Micronutrient deficiencies, especially in high-performance sports, can lead to serious consequences such as fatigue, reduced immune function, and impaired recovery, all of which ultimately hinder athletic development and performance (Felice et al., 2024).

Another notable finding is the misunderstanding around balanced nutrition principles, particularly daily vegetable intake (Khadka et al., 2025). Only 40.9% of respondents correctly identified the recommended serving, which aligns with research by Although athletes recognize the value of consuming plant -based foods, they commonly do not meet the suggested guidelines for vegetable intake. This may be influenced by a lack of practical guidance on food portioning and planning, a factor emphasized by Putra et al. (2022), who observed that even among athletes with general nutrition knowledge, the ability to translate this into daily eating behavior is often insufficient.

The fact that only 13.6% of athletes demonstrated a very good level of nutritional knowledge, while 50% were categorized as moderate and another 18.1% as poor or very poor, raises serious concerns about the sufficiency of nutritional education within the club setting. These findings reflect broader patterns in Indonesian sports development, where emphasis on physical and technical training frequently overshadows support for nutrition and

recovery management (Foo et al, 2021). Compared to international standards, where teams regularly include nutritionists as part of the coaching staff, many local clubs still lack structured programs that educate athletes on the science of diet and performance (Logue et al., 2021).

The prevalence of misconceptions—such as the belief that individuals with normal body weight automatically fulfill their energy requirements (68.2% answered incorrectly)—demonstrates a fundamental misunderstanding of energy balance and nutrient adequacy. Body weight alone is not a reliable indicator of nutritional status, especially in athletes who may have high energy expenditures that require precise nutrient timing and composition to maintain performance (Martín-Rodríguez et al., 2024). This highlights the discrepancy noted by Sims et al. (2023), who observed that athletes tend to depend on visual cues or habitual eating behaviors instead of evidence-based nutritional strategies, leading to variability in performance and delayed recovery.

Furthermore, the respondents' strong performance in some areas (e.g., benefits of milk, fish, and eggs for adolescent development—86.4% correct) but weak performance in others illustrates a fragmented understanding of nutrition. This suggests that informal knowledge—possibly obtained from peers, coaches, or online sources—is selectively internalized, which may lead to a skewed perception of what constitutes a healthy or performance-enhancing diet (Calzolari et al., 2023). Without structured interventions, athletes may continue to operate on partial or inaccurate information (Pennock et al., 2024).

The implications of these findings are far-reaching. Athletes with limited knowledge of sports nutrition are more likely to engage in suboptimal dietary practices, such as skipping meals, inadequate hydration, or poor post-training recovery strategies, which have been directly linked to fatigue, decreased endurance, and increased risk of injury (Sosiawan, 2022). Additionally, long-term nutritional deficiencies may not only impair physical performance but also cognitive function, mood stability, and immune health—factors that are crucial for sustaining performance in competitive badminton, where both physical and mental stamina are essential (Rifalia et al., 2024).

When compared to other sports, such as football or athletics, where several studies report higher awareness of sports-specific dietary requirements (Kurniawan et al., 2022), badminton athletes appear to be underinformed. This could be due to the lesser emphasis placed on physiological demands in racket sports compared to endurance or contact sports. However, this perception needs to be corrected, as badminton involves high-intensity, short-duration bursts of activity that place significant strain on muscular endurance and metabolic systems.

Considering the above, it becomes clear that badminton-specific nutrition education programs are urgently needed. These programs should not only focus on general dietary guidelines but also include practical modules on pre- and post-exercise nutrition, hydration strategies, recovery foods, and the physiological impacts of specific nutrients (Naderi et al., 2025). Such interventions should be integrated into athletes' training schedules, ideally in collaboration with certified nutritionists and coaches. Interactive workshops, individual consultations, and periodic assessments may improve both knowledge and application, contributing to better performance and reduced injury risks (Chen et al., 2024).

In conclusion, this study affirms the critical role of nutritional knowledge in shaping the dietary behavior and athletic outcomes of badminton players. The current levels of understanding among athletes at Club Champion Gading Jaya suggest that without targeted educational support, athletes may not fully capitalize on their training potential. However, this study also has several limitations. The small sample size (22 athletes) limits the generalizability of the findings to wider badminton populations in Indonesia. Additionally, since the data were collected using self-administered ques-

tionnaires, responses may be subject to social desirability bias or misinterpretation of questions, despite researcher supervision. Lastly, the study focused on a single club in a specific region, which may not reflect the broader diversity of training environments and nutritional exposure across other regions or competitive levels.

Future research should therefore expand to include larger, more diverse samples and employ mixed-method designs that combine knowledge assessments with observational dietary tracking. Evaluating the effectiveness of structured nutrition education programs in improving not just knowledge, but also measurable performance outcomes, will be a critical next step. Strengthening nutrition literacy must become a cornerstone of athlete development programs in Indonesia if long-term competitive success is to be achieved.

CONCLUSION

This study confirms the importance of improving badminton athletes' nutritional knowledge as a foundation for enhancing performance and supporting overall athletic development.

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