

Audiovisual Based Nutrition Education Strategies in Improving Balanced Nutrition Knowledge and Hydration Management of Young Football Athletes

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ABSTRACT

This study aims to evaluate the effectiveness of audiovisual media-based sports nutrition education interventions on improving the understanding of balanced nutrition and fluid regulation in young football athletes. This intervention activity used a pre-posttest scheme design involving 49 people consisting of 24 parents of athletes and 25 youth football athletes at Batu Football Academy (BAFA). Education was delivered combining interactive presentations and structured video instruments on the four pillars of balanced nutrition and rehydration time management. Knowledge level parameters were measured using a structured questionnaire that had been validated and analyzed using a paired t-test. Empirical analysis showed a very significant spike in knowledge scores between before the intervention (56.67 ± 18.33) and after the intervention (75.24 ± 14.70) with a $p < 0.001$.

INTRODUCTION

The achievements of national football in the young age group show dynamic fluctuations in the map of international competitions. To maintain peak performance consistently, an athlete is not only required to have technical agility and psychological maturity, but also excellent physiological function support. This is where the importance of precise sports nutrition management lies. Food consumption must be managed based on the principle of balanced nutrition including the right proportion of macronutrients and micronutrients and balanced with an adequate hydration strategy to maintain stamina stability and prevent performance decline due to dehydration during training and matches (Irianto, 2007; Ministry of Health of the Republic of Indonesia, 2013). Balanced nutrition in young athletes is crucial not only to support muscle mechanical work, but also to optimize the process of physical growth and post-activity recovery (Majba, 2021).

However, the reality on the field shows that there is a massive knowledge gap among young footballers. The majority of adolescent athletes have not implemented appropriate intake patterns due to limited information and low literacy in choosing foods that support biological performance. Many of them experience the phenomenon of voluntary dehydration, which is a condition in which athletes do not consume enough fluids during training sessions despite freely available access to drinking water on the field (Santos-Sánchez et al., 2025). Pre-training hypohydration conditions have proven to be very common in youth football academies in various parts of the world, ranging from 60% to 80% of the total athlete population (Dieny, 2015; Santos-Sánchez et al., 2025). Physiologically, a body fluid deficit that exceeds 2% of body weight will trigger increased cardiovascular stress, accelerate muscle glycogen exhaustion, and decrease cognitive function that is essential in tactical decision-making in the field (Adan, 2012; Putrianasari & Rahmawati, 2024).

Based on the initial situation analysis of the service partner, namely Batu Football Academy (BAFA), several correlations between nutritional status anomalies and clinical metabolic manifestations were found that were quite worrying: (1) As many as 10% of athletes were included in the category of undernourished status (thin) and 3% were overnourished (obese); (2) Clinical manifestations showed that 16.67% of athletes had anemia and 83.33% indicated hyperuricemia; (3) There is a massive macronutrient disproportion: 20% of athletes experience an energy deficit, while the other 30% are excessive. Excess protein intake was found in 87% of athletes (reaching 186% of the actual requirement), followed by excess fat (13%) and carbohydrate (27%) intake. This gap reflects the poor distribution of nutrient intake that is commonly found in school-age academy athletes (Majba, 2021); (4) The majority of athletes experience chronic fluid deficits due to the habit of consuming high-sugar packaged drinks (sweetened tea and bottled drinks) and low frequency of rehydration between training sessions.

Given that behavioral shading is much more effective if initiated from an early age (Notoatmodjo, 2010), interventions in the form of evidence-based nutrition education using an interactive multimedia approach are the main urgency to break the chain of malnutrition and dehydration problems in young football athletes at BAFA.

IMPLEMENTATION AND METHODS

This community service intervention was carried out involving 49 people consisting of 24 parents of athletes and 25 football athletes who are members of the Batu Football Academy (BAFA). The program is carried out at the BAFA homebase sports facility by a team of experts from the Faculty of Medicine, State University of Malang who have linear competencies in the fields of sports nutrition and human physiology. The core material delivered by Dr. dr. Moch. Yunus, M.Kes.

The method of delivering material combines interactive presentation strategies (PowerPoint) and the playback of visually designed educational video instruments to facilitate children's memory retention. The flow of the implementation of the activity was systematically arranged in a duration of 100 minutes (14.50.00–16.30 WIB) with chronological stages as illustrated in Diagram 1.

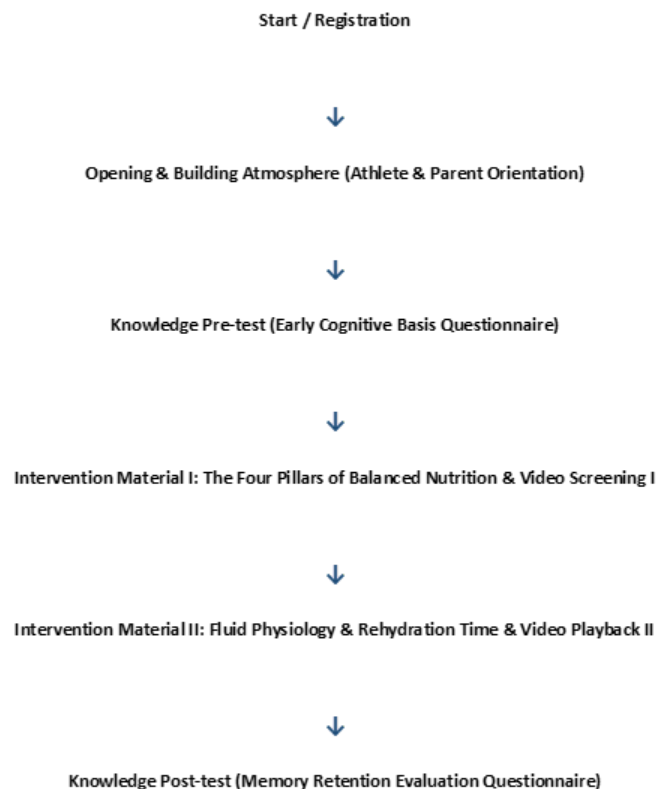


Figure 1. Systematic Flow of Stages of Implementation of Audiovisual-Based Nutrition Education Program at BAFA

The data collection instrument used a structured questionnaire sheet containing valid question items related to macronutrients, micronutrients, clinical indications of dehydration, and regulation of sports fluids. The quantitative data obtained were tested for normality first before a paired comparative test using *paired t-test analysis* to measure the level of significance of changes in knowledge parameters before (*pre-test*) and after (*post-test*) intervention was given.

RESULTS AND DISCUSSION

The implementation of the intervention was conducive, interactive, and received high enthusiasm from young athletes. The first component of the material is focused on reconstructing the understanding of the "Four Pillars of Balanced Nutrition", which emphasizes the importance of varying food consumption to meet energy needs, habituating a clean lifestyle to prevent infections, structured physical activity, and periodic weight monitoring. The second material emphasizes the physiological aspects of hydration, the identification of optimal fluid sources for exercisers, and the management of *pre-, during, and post-workout hydration timing to eliminate the bad habit of consuming high-sugar packaged drinks*.

A quantitative evaluation of the effectiveness of this program showed positive results. The empirical data on the shift in knowledge levels is presented in Table 1 below:

Table 1. Comparative Analysis of Athlete Knowledge Scores Before and After Nutrition Education Interventions (n = 49)

Average Score ± SD Evaluation Parameters	Gain Score	Value p (p- Status Significance value)
Pre-test (Before Education)		
Post-test (After 56.67 ± 18.33)	18,57	Very Significant (p < 0,001 0,05)
Education	75,24 ± 14,70	

Visually, a significant increase in the level of cognitive understanding of athletes after being given educational interventions using audiovisual media can be observed in the Comparison Graph (Figure 1) below:

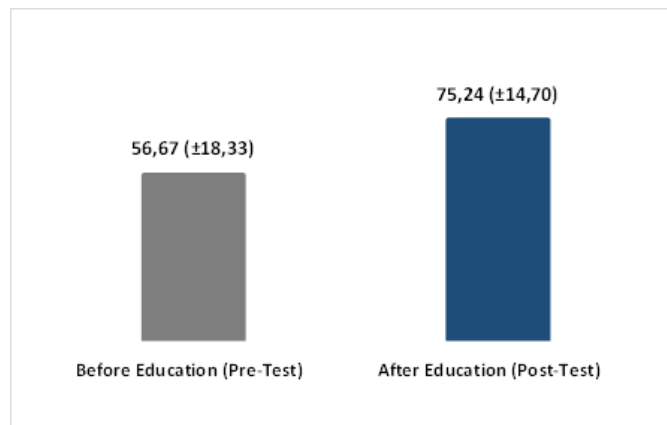


Figure 2. Comparison Chart of Athletes' Average Nutrition and Hydration Knowledge Score Before and After Intervention

A very significant increase in the average knowledge score from 56.67 to 75.24 ($p < 0.001$) empirically confirmed that the audiovisual-based educational approach has high effectiveness in transferring information into the athlete's short-term memory. These findings reinforce the latest study from Sunarya (2025) which recorded an average spike in hydration knowledge of 26.6 points in young football academy athletes post-audiovisual intervention. In terms of educational psychology and neurophysiology, the use of motion visualization (video) is able to stimulate sensory and visual simultaneously. This combination of stimuli facilitates the conceptualization of abstract materials such as fluid regulation, water metabolism, and the adverse impact of hypohydration on motor coordination in the field much better than conventional lecture methods (Hidayati, 2011).

The success of increasing this knowledge is crucial because sports nutrition knowledge is the main predictive factor (*pioneer step*) that underlies the formation of fluid consumption behavior and food selection in athletes in the field (Buntarian et al., 2021). When a young athlete understands the early signs of dehydration (such as urine discoloration or post-workout weight loss), they tend to be more proactive in performing self-hydration on a scheduled basis without having to wait for instructions from the coach (Putrianasari & Rahmawati, 2024; Sunarya, 2025).

Despite the increase in cognitive aspects (*knowledge*), the senior research team emphasized that this cognitive shift requires continuous monitoring (*maintenance phase*) in order to transform into consistent real actions (*practices*). The active involvement of parents in providing a variety of balanced nutritionally sourced foods at home, as well as the commitment of the coaching team in providing regular *water breaks* between training sessions, are the main determinants to maintain the optimal *hydration status (euhydration)* of BAFA athletes in the long term (Buntarian et al., 2021; Santos-Sánchez et al., 2025).



Figure 3. Documentation of the Activity Series

CONCLUSIONS AND RECOMMENDATIONS

Audiovisual media-based nutrition education interventions have proven to be significantly effective in improving the cognitive capacity of young football athletes at Batu Football Academy (BAFA) related to the pillars of balanced nutrition and sports hydration management. This surge in understanding is expected to be the main foundation for changes in athletes' daily consumption behavior. Thus, the problem of disproportion of nutrient intake and the risk of dehydration in the field can be reduced, in order to support healthy physical growth as well as the achievement of optimal sports performance in the future.

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