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Effects of a Nutrition Education Program on Mediterranean Diet Adherence in School-Age Boys Playing Amateur Soccer: A Pilot Pre–Post Study

Efectos de un programa de educación nutricional sobre la adherencia a la dieta mediterránea en niños en edad escolar que practican fútbol amateur: estudio piloto pre–post

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ABSTRACT

Introduction: Evidence on nutrition education in amateur youth soccer is limited. This study evaluated the effects of a structured nutrition education program on Mediterranean diet quality, dietary intake patterns (food-group consumption frequency), anthropometrics, and healthy eating self-efficacy in school-age boys playing amateur soccer.

Methods: A single-group pilot pre–post study was conducted in a sports club, including 60 boys aged 8–10 years (9.10 ± 0.80). The intervention comprised four weekly sessions based on the Turkish Dietary Guidelines (TÜBER), delivered in four groups (~15 children/group), each lasting 20–30 minutes, with take-home leaflets for parents. Outcomes included height, body mass and BMI (WHO AnthroPlus Z-scores), the Children's Healthy Eating Self-Efficacy Scale (CHSE-ES), the Mediterranean Diet Quality Index for Children and Adolescents (KIDMED), and food consumption frequency.

Results: KIDMED scores increased after the program ($p < 0.001$), with fewer children classified as low adherence and more as high adherence. Overall, reported consumption shifted toward more nutrient-dense choices and less energy-dense snack foods (all $p < 0.05$). Healthy eating self-efficacy did not change significantly ($p > 0.05$). Anthropometric indicators showed no significant pre–post differences overall ($p > 0.05$).

Conclusions: A brief nutrition education program delivered in a sports club setting was associated with improved Mediterranean diet quality and favorable changes in reported dietary patterns, while self-efficacy and anthropometric outcomes remained unchanged over the short follow-up. Controlled studies with larger samples and longer follow-up are warranted.

Funding: No funding was received to conduct this study.

Keywords: Mediterranean Diet; Nutrition Education; Pilot Study; Anthropometry; Youth Soccer

RESUMEN

Introducción: La evidencia sobre la educación nutricional en el fútbol juvenil amateur es limitada. Este estudio evaluó los efectos de un programa estructurado de educación nutricional sobre la calidad de la dieta mediterránea, los patrones de ingesta dietética (frecuencia de consumo por grupos de alimentos), los indicadores antropométricos y la autoeficacia para una alimentación saludable en niños en edad escolar que practican fútbol amateur.

Metodología: Las puntuaciones del KIDMED aumentaron tras el programa ($p < 0,001$), con menos niños clasificados con baja adherencia y más con alta adherencia. En general, el consumo informado se desplazó hacia opciones más densas en nutrientes y una menor ingesta de alimentos tipo snack de alta densidad energética (todos $p < 0,05$). La autoeficacia para una alimentación saludable no cambió de forma significativa ($p > 0,05$). Los indicadores antropométricos no mostraron diferencias significativas pre–post en conjunto ($p > 0,05$).

Resultados: Las puntuaciones del KIDMED aumentaron tras el programa ($p < 0,001$), con menos niños clasificados con baja adherencia y más con alta adherencia. En general, el consumo informado se desplazó hacia opciones más densas en nutrientes y una menor ingesta de alimentos tipo snack de alta densidad energética (todos $p < 0,05$). La autoeficacia para una alimentación saludable no cambió de forma significativa ($p > 0,05$). Los indicadores antropométricos no mostraron diferencias significativas pre–post en conjunto ($p > 0,05$).

Conclusiones: Un breve programa de educación nutricional aplicado en un club deportivo se asoció con una mejora de la calidad de la dieta mediterránea y cambios favorables en los patrones dietéticos informados, mientras que la autoeficacia y los resultados antropométricos no cambiaron durante el corto periodo de seguimiento. **Financiación:** No se recibió financiación para llevar a cabo este estudio.

Palabras clave: Dieta mediterránea; Educación nutricional; Estudio piloto; Antropometría; Fútbol juvenil.

KEY MESSAGES

- In this pilot, short follow-up study, a brief club-based nutrition education program was associated with improved diet quality in youth soccer players.
- Mediterranean diet adherence (KIDMED score) increased significantly after the education program.
- Reported dietary patterns shifted toward more nutrient-dense foods and less energy-dense, nutrient-poor snacks, while anthropometric indicators and healthy eating self-efficacy did not change significantly during the short follow-up period.

INTRODUCTION

Nutrition is a key determinant of health, growth, and development in childhood. In school-age children, adequate and balanced dietary intake supports optimal growth, immune function, and cognitive outcomes, and this period is critical for establishing dietary habits that may persist into adulthood (1, 2).

For children who participate regularly in organized sports, nutrition is also central to performance and overall health. Adequate energy and nutrient intake supports training adaptation, competition performance, and recovery in young athletes undergoing growth and maturation (3-5). Appropriate nutrition practices have been associated with better performance-related outcomes, whereas insufficient or unbalanced intake may contribute to early fatigue, increased injury risk, and impaired growth (6). Healthy dietary behaviors in this group have also been linked to stronger immune resilience, fewer illness and injury episodes, and more favorable body composition (4).

Nutrition education may represent a practical and scalable intervention during this developmental stage. Evidence indicates that nutrition education in childhood can improve nutrition-related knowledge, attitudes, and behaviors (7). This is especially relevant for young athletes, who often have limited nutrition knowledge and rely on informal sources such as family, coaches, or popular media, which may contribute to non-evidence-based practices. Developmentally appropriate, evidence-based education may therefore help children adopt dietary habits that support both performance and long-term health (8).

However, evidence remains limited regarding the combined effects of nutrition education on self-efficacy, diet quality, eating behaviors, and objectively recorded dietary intake, particularly among amateur youth athletes. In Türkiye, comprehensive intervention studies evaluating nutrition-related self-efficacy, diet quality, eating behaviors, dietary records, and anthropometric measures in school-age amateur football players are scarce. Therefore, as a pilot pre–post study, the present research aimed to explore the preliminary effects and practical feasibility of a structured nutrition education program delivered to school-age boys playing amateur football on nutrition-related self-efficacy, diet quality, eating behaviors, and dietary habits.

We hypothesized that the nutrition education program would be associated with improvements in nutrition-related self-efficacy, Mediterranean diet adherence/diet quality, and selected eating behaviors and dietary intake indicators after the intervention period.

METHODS

Study Design and Participants

This single-group pre–post study included boys aged 8–10 years playing amateur soccer at a sports club in Istanbul, Türkiye. Of 66 eligible children registered at the club, 60 participated with parental informed consent; children with chronic disease, missing consent, or who declined participation were excluded. As this was a pilot study, the sample size was based on feasibility (the number of eligible children available at the club during the study period and logistical capacity to deliver the sessions), rather than on an a priori power calculation.

Ethical Approval

Ethical approval was obtained from the Non-Interventional Scientific Research Ethics Committee of Istanbul Medeniyet University (15/06/2022; No: E-22686390-050.99-24224), and written permission was granted by the sports club.

Registration

This pilot pre–post study was not prospectively registered in a public trial registry due to its exploratory, feasibility-focused nature. Future confirmatory trials will be prospectively registered.

Nutrition Education Program and Procedure

The study comprised baseline assessment, a 4-week education phase, and post-intervention assessment. At baseline, participant characteristics and physical activity were recorded, anthropometric measurements were obtained, and the Children's Healthy Eating Self-Efficacy Scale (CHSE-ES), Mediterranean Diet Quality Index (KIDMED), a food frequency questionnaire (FFQ), and a 3-day dietary record were administered. A food frequency questionnaire (FFQ) tailored to Turkish dietary patterns was used to assess usual consumption frequency over the previous month, structured by food-group categories and ordered frequency response options (e.g., every day, 5–6 times/week, 3–4 times/week, 1–2 times/week, never).

The education program was based on the Turkish Dietary Guidelines (TÜBER) program was developed based on the main themes of the TÜBER (9) and informed by Özcan et al. (10) Four sessions were delivered once weekly; each lasted 20–30 minutes (total ~90 minutes). Children were divided into four groups (~15/group). Sessions were supported with presentations and brochures, and summary leaflets were provided for parents. After a 21-day consolidation period (11-13), post-intervention assessments were repeated using the same procedures.

Measures

Sociodemographic and health information were collected using an 11-item researcher-developed form. Healthy eating self-efficacy was assessed using the CHSE-ES (14, 15), a 9-item, 3-point Likert scale (0–2; total 0–18; higher scores indicate greater self-efficacy). Diet quality was evaluated with KIDMED (16, 17); a 16-item index scored from 0 to 12 (≥8 optimal, 4–7 needs improvement, ≤3 very low).

Body mass (0.1 kg precision; Tanita) and height were measured by the same trained researcher under standard conditions, BMI was calculated (kg/m²), and BMI-for-age Z-scores and percentiles were evaluated using World Health Organization (WHO) AnthroPlus. Dietary intake was assessed using 3-day dietary records analyzed using the BeBiS nutrition information system (BeBiS 7.0; Ebispro for Windows, Stuttgart, Germany; Turkish version) to estimate total energy and nutrient intakes, including macronutrients as well as calcium and vitamin D (Table 5). Usual monthly food-group consumption was assessed via a food frequency questionnaire (FFQ) (Table 4).

Statistical Analysis

Data were analyzed in SPSS v21.0. Normality was assessed using the Kolmogorov–Smirnov test and graphical methods. Continuous variables were summarized as mean ± SD or median (min–max), and categorical variables as n (%). Pre–post comparisons of continuous variables used paired-samples t-tests or Wilcoxon signed-rank tests as appropriate. Pre–post comparisons of paired categorical variables were performed using the marginal homogeneity test. A p value < 0.05 was considered statistically significant. Given the pilot pre–post design and multiple outcomes assessed, analyses were considered exploratory and hypothesis-generating.

RESULTS

Sixty boys aged 8–10 years participated, with most clustered in the 9–10 age range (See Table 1). The highest proportion of children were in the 4th grade (35.0%). The mean number of siblings was 1.9 ± 0.7, with two siblings being the most common category (58.3%).

Table 1. Demographic characteristics of participating children

	n (%)	Mean(SD)	Median [min-max]
Age (years)		9.10(0.80)	9 [8-10]
8	15 (25.00)		
9	22 (36.70)		
10	23 (38.30)		
Grade		4.10(1)	4 [2-6]
2.	5 (8.30)		
3.	11 (18.30)		
4.	21 (35.00)		
5.	20 (33.30)		
6.	3 (5.00)		
Number of Siblings		1.90(0.70)	2 [1-4]
1	14 (23.30)		
2	35 (58.30)		
3	9 (15.00)		
4	2 (3.30)		

As seen in Table 2, weight-for-age and BMI-for-age distributions did not change significantly between the pre- and post-intervention assessments (p = 0.705; p = 0.763), whereas height-for-age categories showed a significant shift (p = 0.046).

Table 2. Comparison of children's anthropometric Z-score classifications and anthropometric measurements before and after the intervention

Z-score classification	Pre-intervention n (%)	Post-intervention n (%)	p
Weight -for- age			
Underweight (≥- 2SD- <- 1SD)	3 (5.00)	3 (5.00)	
Normal (≥- 1 SD- <+ 1SD)	42 (70.00)	41 (68.30)	0.705[a]
Overweight (≥ + 1SD- <+ 2SD)	13 (21.70)	14 (23.30)	
Obese (≥ + 2SD)	2 (3.30)	2 (3.30)	
Height -for-age			
Very Short (<- 2SD)	1 (1.70)	0 (0)	
Short (≥- 2SD- <- 1SD)	7 (11.70)	5 (8.30)	**0.046[a]**
Normal (≥- 1 SD- <+ 1SD)	42 (70.00)	45 (75.00)	
Tall (≥ + 1SD- <+ 2SD)	9 (15.00)	9 (15.00)	
Very Tall (≥ + 2SD)	1 (1.70)	1 (1.70)	
BMI- for -age			
Extremely Underweight (<- 2SD)	3 (5.00)	0 (0)	
Underweight (≥- 2SD- <- 1SD)	4 (6.70)	5 (8.30)	0.763[a]
Normal (≥- 1 SD- <+ 1SD)	36 (60.00)	40 (66.70)	
Overweight (≥ + 1SD- <+ 2SD)	14 (23.30)	12 (20.00)	
Obese (≥ + 2SD)	3 (5.00)	3 (5.00)	
Anthropometric measurements	Mean(SD)	Mean(SD)	
Height (cm)	136.0 (7.4)	136.4 (7.1)	0.001[b]
Body Mass (kg)	32.5 (6.4)	32.9 (5.9)	0.006[b]
BMI (kg/m^2)	17.6 (2.7)	17.7 (2.5)	0.116[b]

[a]Marginal homogeneity test; [b]Paired t-test. p< 0.05.

BMI: Body Mass Index, cm:centimetrer; kg:kilogram

As shown in Table 3, healthy eating self-efficacy did not change significantly (p = 0.072). In contrast, Mediterranean diet adherence improved markedly, with higher diet quality scores (p < 0.001) and a favorable shift from low toward high adherence categories (p = 0.008).

Table 3. Comparison of children's scale score means before and after the intervention

Scales		Pre-intervention	Post-intervention	p
Children's Healthy Eating Self-Efficacy Scale (CHSE-ES)	Median [min-max]	3 [0-14]	3 [0-12]	0.072[a]
Mediterranean Diet Quality Index (KIDMED)	Median [min-max]	5 [0-11]	7 [3-11]	**<0.001[a]**
	Low (≤3),n (%)	12 (20)	4 (6.70)	**0.008[b]**
	Moderate (4-7), n (%)	34 (56.70)	34 (56.70)	
	High (≥8), n (%)	14 (23.30)	22 (36.70)	

[a]: Wilcoxon signed-rank test (pre–post scale scores). [b]: Marginal homogeneity test (pre–post KIDMED categories). KIDMED, Mediterranean Diet Quality Index; CHSE-ES, Children's Healthy Eating Self-Efficacy. Scale. p< 0.05 statistically significant.

Table 4 shows changes in food consumption frequencies before and after the intervention. Post-intervention, consumption frequency increased for several nutrient-dense items (notably vegetables and fish) and decreased for several energy-dense snack items (including ice cream, biscuits/cookies, chips, and sugary products), with statistically significant changes observed across these items (all $p < 0.05$).

Table 4. Changes in food consumption frequencies before and after the intervention

Foods n (%)	Every day	5–6 times/week	3-4 times/week	1-2 times/week	Never	p
Ice cream						
Pre-intervention	10 (16.7)	9 (15)	15 (25)	20 (33.3)	6 (10)	**0.001**
Post-intervention	5 (8.3)	8 (13.3)	12 (20)	25 (41.7)	10 (16.7)	
Cheese and cheese products						
Pre-intervention	18 (30)	7 (11.7)	10 (16.7)	17 (28.3)	8 (13.3)	**0.014**
Post-intervention	23 (38.4)	13 (21.7)	7 (11.7)	11 (18.3)	6 (10)	
Meat and Meat Products						
Pre-intervention	6 (10)	11 (18.3)	14 (23.3)	28 (46.7)	1 (1.7)	**0.029**
Post-intervention	3 (5)	21 (35)	19 (31.7)	17 (28.3)	0 (0)	
Fish						
Pre-intervention	2 (3.3)	1 (1.7)	4 (6.7)	37 (61.7)	16 (26.7)	**0.044**
Post-intervention	2 (3.3)	2 (3.3)	7 (11.7)	42 (70)	7 (11.7)	
Green leafy vegetables						
Pre-intervention	2 (3.3)	8 (13.3)	15 (25)	30 (50)	5 (8.3)	**0.008**

Post-intervention	3 (5)	14 (23.3)	21 (35)	19 (31.7)	3 (5)	
Other vegetables						
Pre-intervention	3 (5)	8 (13.3)	19 (31.7)	26 (43.3)	4 (6.7)	**0.033**
Post-intervention	3 (5)	16 (26.7)	20 (33.3)	18 (30)	3 (5)	
Fresh fruit juice						
Pre-intervention	4 (6.7)	5 (8.3)	13 (21.7)	25 (41.7)	13 (21.7)	**0.019**
Post-intervention	6 (10)	12 (20)	11 (18.3)	24 (40)	7 (11.7)	
Vegetable Oils						
Pre-intervention	24 (40)	7 (11.7)	13 (21.7)	8 (13.3)	8 (13.3)	**0.035**
Post-intervention	15 (25)	11 (18.3)	10 (16.7)	10 (16.7)	14 (23.3)	
Sugar						
Pre-intervention	15 (25)	5 (8.3)	15 (25)	11 (18.3)	14 (23.3)	**0.026**
Post-intervention	2 (3.3)	8 (13.3)	15 (25)	26 (43.3)	9 (15)	
Chocolate, etc.						
Pre-intervention	15 (25)	10 (16.7)	16 (26.7)	15 (25)	4 (6.7)	**0.011**
Post-intervention	9 (15)	11 (18.3)	12 (20)	24 (60)	4 (6.7)	
Biscuits/Cookies						
Pre-intervention	8 (13.3)	9 (15)	11 (18.3)	22 (36.7)	10 (16.7)	**0.029**
Post-intervention	3 (5)	6 (10)	17 (28.3)	16 (26.7)	18 (30)	
Chips						
Pre-intervention	5 (8.3)	4 (6.7)	10 (16.7)	28 (46.7)	13 (21.7)	**0.045**
Post-intervention	2 (3.3)	3 (5)	8 (13.3)	28 (46.7)	19 (31.7)	

Marginal homogeneity test, p<0.05 statistically significant

Table 5. Changes in energy and nutrient intakes before and after the intervention and adequacy relative to TÜBER recommendations

Nutrient	TÜBER recommendation	Pre-intervention Mean) (SD)	Post-intervention Mean (SD)	p	Pre adequacy ratio (%)	Pre category	Post adequacy ratio (%)	Post category
Energy (kcal)	Age-/sex-specific EER	1186.8 (378.1)	1097.3 (291.3)	0.183	NA†	NA	NA†	NA
CHO (%)	45–60%	45.9 (7.2)	45.1 (7.9)	0.554	—	Adequate	—	Adequate
CHO (g/day)	130 g/day	131.8 (54.7)	122.3 (32.5)	0.275	101.4	Adequate	94.1	Adequate
Protein (%)	5–20%	16.9 (4.4)	18.6 (4.1)	0.021	—	Adequate	—	Adequate
Protein (g/day)	23–28 g/day	48.78 (16.6)	51.6 (15.6)	0.316	173.9‡	Excessive	184.3‡	Excessive
Fat (g/day)	No single reference value	49.8 (17.9)	44.9 (14.8)	0.108	NA§	NA	NA§	NA
Fat (%)	20–35%	36.8 (5.6)	36.4 (10.0)	0.379	—	Excessive	—	Excessive
Vitamin D (µg/day)	15/day	2.91 (4.24)	2.05 (1.85)	0.032	19.4	Inadequate	13.7	Inadequate
Calcium (mg/day)	800 mg/day	489.9 (251.2)	533.3 (183.1)	0.044	61.2	Inadequate	66.7	Inadequate

As seen in Table 5, overall, no significant pre–post differences were observed in total energy or most macro-nutrients between baseline and post-intervention (all p > 0.05). However, the percentage of energy from protein increased (p = 0.021) and calcium intake increased (p = 0.044), whereas vitamin D intake decreased (p = 0.032). When interpreted against TÜBER recommendations using mean-based adequacy, CHO% and protein% remained adequate both pre-and post-intervention, whereas fat% persisted above the recommended upper range.

Paired-samples t-test or Wilcoxon signed-rank test. p<0.05 statistically significant.

The adequacy classification reported in this table is mean-based (based on the group mean relative to the TÜBER recommendation). For single-value recommendations, adequacy ratio (%) = (mean intake / reference value) × 100; values may exceed 100%. For range recommendations (e.g., CHO%, protein%, fat%), adequacy ratios were not calculated (shown as "—"); categories were assigned as below/within/above the recommended range. Supplementary Table S1 provides the full three-category display and 95% confidence intervals for adequacy ratios (single-value recommendations). †Energy: NA because inputs required to compute EER were unavailable. ‡Protein (g/day): adequacy ratio computed using the upper bound of the reference range (28 g/day) as the denominator. §Fat (g/day): NA because no single gram-based target value was provided; fat adequacy was evaluated using fat (%). Abbreviations: CHO, carbohydrate; EER, estimated energy requirement; CI, confidence interval; SD, standard deviation; kcal, kilocalorie; g, gram; mg, milligram; µg, microgram; NA, not assessable; TÜBER, Turkey Dietary Guidelines (Türkiye Beslenme Rehberi).

DISCUSSION

This study examined the effects of a structured nutrition education program delivered to school-age boys playing amateur soccer on anthropometric indicators, Mediterranean diet adherence, and healthy eating self-efficacy. Overall, the findings indicate that the intervention was associated with improvements in dietary quality and selected eating behaviors. This is particularly relevant for sports requiring regular training, such as soccer, where adequate nutrition supports healthy growth, training adaptation, recovery, and injury risk management (18). However, given the single-group pre–post design, the findings should be interpreted as exploratory and do not allow causal attribution.

The significant post-intervention increase in KIDMED scores suggests an overall improvement in Mediterranean diet adherence. Following the education program, the proportion of children with low adherence decreased, while the proportion with high adherence increased. Increases in vegetable and fish consumption likely contributed to this improvement. Given the widespread use of the KIDMED index in children and adolescent populations, including youth soccer players, these findings support the role of education-based approaches in improving diet quality among young athletes(19, 20). Nutrition education was also associated with favorable changes in food consumption patterns, with a shift toward more nutrient-dense foods and reduced intake of energy-dense, nutrient-poor snacks. Together, these findings indicate a shift toward healthier food choices following the intervention.

From a growth and sports performance perspective, increased intake of protein- and calcium-rich foods is particularly important, as these nutrients support muscle repair, bone health, and overall growth in young athletes (21). In the present pilot study, the observed increases in calcium intake and in the percentage of energy derived from protein should be viewed as hypothesis-generating, particularly because dietary data were self-reported and no objective biomarkers or performance outcomes were assessed. These findings align with previous school-based nutrition education studies demonstrating improvements in children's dietary patterns, particularly increased fruit and vegetable intake (22). No statistically significant changes were observed in anthropometric indicators following the intervention. Weight-for-age and BMI-for-age Z-score distributions remained similar before and after the education program, suggesting that short-term nutrition education did not translate into measurable changes in body mass status. In growing children, relative body mass stability over short periods may reflect appropriate energy balance, and the absence of marked anthropometric change is therefore not unexpected (23).

Although no change in body mass status was detected, a modest improvement was observed in height-for-age Z-score distribution, with an increase in the proportion of children classified as having normal height. This finding should be interpreted with particular caution, as it may reflect normal growth and maturation over time. Given the short follow-up period and the absence of a control group, it is not possible to attribute this modest shift to the intervention. Accordingly, any linkage between improved diet quality and height-related outcomes should be considered exploratory rather than confirmatory. With respect to psychosocial outcomes, no significant change was found in healthy eating self-efficacy scores. Although a slight decline was observed, this was not statistically significant, suggesting that short-term education alone may be insufficient to strengthen children's confidence in applying healthy eating behaviors. Previous studies have similarly reported low levels of healthy

eating self-efficacy among school-age children (24). According to Bandura's social cognitive framework, self-efficacy requires not only knowledge acquisition but also confidence in one's ability to implement that knowledge. Thus, while diet quality indicators improved, children's perceived ability to independently sustain healthy eating behaviors may not change over a short intervention window without additional behavioral practice and reinforcement**.** Environmental and contextual factors may further influence self-efficacy among young athletes, including food availability, meal planning around training and competition, and guidance from family members and coaches. In line with this, Kasımoğlu and Gürarslan Baş reported an inverse relationship between healthy eating self-efficacy and family support, suggesting that excessive caregiver control over dietary choices may limit opportunities for autonomy and self-efficacy development (24). Accordingly, future interventions that actively involve families coaches, and incorporate behavior change techniques (e.g., goal setting, self-monitoring, and guided practice) may better support children in applying learned behaviors in both home and sports settings.

When energy and nutrient intakes were compared before and after the intervention, no significant differences were observed in total energy intake or in carbohydrate, protein (g), and fat (g and % of energy) intakes. This indicates that changes primarily reflected food quality rather than quantity. Children reduced consumption of packaged snacks and sugary foods while shifting toward more nutrient-dense options, without increasing total caloric intake. According to TÜBER, mean carbohydrate and protein energy shares were within the recommended ranges at both time points, whereas mean fat energy share was above the upper limit. Importantly, the proportion of energy derived from protein increased significantly, alongside a significant increase in calcium intake. These changes are particularly relevant for bone health and tissue repair in physically active children and may contribute to reduced long-term injury risk (21, 23).

Overall, the nutrition education program was associated with positive changes in dietary quality and eating behaviors among school-age children playing amateur soccer. Improvements in Mediterranean diet adherence and nutrient intake profiles suggest that meaningful dietary changes may be achieved even over relatively short periods when education is appropriately structured. To enhance long-term impact, such programs should be sustained and reinforced through coordinated efforts involving schools, families, and sports clubs. Future studies incorporating control groups, larger samples, and longer follow-up periods are needed to more robustly evaluate effects on growth-related and psychosocial outcomes.

Several limitations should be acknowledged. The single-group pre-test/post-test design limits causal inference, dietary assessments relied on self-report and may be subject to recall bias, and the short duration of follow-up, along with unmeasured sport-specific factors, may have constrained interpretation of anthropometric and self-efficacy findings.

Another limitation is that parents were not actively involved beyond take-home leaflets; future interventions should incorporate parent-focused components to better support dietary changes at home.

CONCLUSIONS

In this pilot pre–post study, a brief nutrition education program delivered in a sports club setting was associated with improved Mediterranean diet quality (higher KIDMED scores) and favorable changes in reported dietary patterns. No significant changes were observed in anthropometric indicators or healthy eating self-efficacy over the short follow-up. Given the exploratory pilot design, reliance on self-reported dietary data, and absence of a control group, the findings should be considered hypothesis-generating. Controlled studies with longer follow-up are needed to assess sustained effects.

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AUTHORS' CONTRIBUTIONS

Conceptualization: Ö.U., H.Y-Ö; methodology: Ö.U., H.Y-Ö; formal analysis: E.B., C.A.; investigation: Ö.U.; writing-original draft: Ö.U; supervision: H.Y-Ö.

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CONFLICTS OF INTEREST

The authors state that there are no conflicts of interest when writing the manuscript."

DATA AVAILABILITY

Data available on request to the author of the correspondence.

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