OPEN ACCESS

Middle East Research Journal of Medical Sciences
ISSN: 2789-7699 (Print) & ISSN: 2958-2024 (Online)
Frequency: Bi-Monthly
DOI: https://doi.org/10.36348/merjms.2025.v05i06.004

KUWAIT SCHOLARS PUBLISHER

Website: http://www.kspublisher.com/
Email: office@kspublisher.com

Evaluation of Nutrition and Exercise Opportunities in Schools in Kocaeli Province, Turkey

Sefa Kazancı (MD)[1*], Aysen Uncuoglu (MD Proff)[2], Sükrü Hatun (MD Proff)[3], Canan Baydemir (MD Proff)[4], Alev Keser (MD Proff)[5], Fatma Cakmak Kazancı (MD)[6]

[1]MD. Private Corlu Optimed Hospital Tekirdag, Turkey
[2]Kocaeli University Faculty of Medicine, Internal Medicine, Child Health and Diseases Kocaeli, Turkey
[3]Koç University Faculty of Medicine, Department of Pediatric Endocrinology, Istanbul, Turkey
[4]Kocaeli University Faculty of Medicine Department of Biostatistics and Medical Informatics Kocaeli, Turkey
[5]Hacettepe University, Faculty of Health Sciences, Department of Nutrition and Dietetics Ankara, Turkey
[6]Faculty of Medicine, University of Antwerp, Antwerp, Belgium

Abstract: ***Objective:*** In many countries, children spend a significant portion of their waking hours in school. This makes school settings particularly effective for public health interventions. The present study aims to evaluate the nutrition and exercise opportunities available in a sample of primary and secondary schools. ***Methods:*** A total of 41 primary and secondary schools in Kocaeli were visited to document the foods available for sale. School cafeteria menus were systematically reviewed for compliance with Ministry of Health regulations. Information was also gathered regarding the availability of exercise areas and the existence of school sports teams. A structured survey form was developed to systematically evaluate the nutrition and exercise facilities of the schools. Data collection was conducted during the 2015-2016 academic year at the selected schools, focusing on canteen lists, food menus, and exercise facilities. ***Results:*** Of the schools studied, 17 (41.5%) had a cafeteria and 38 (92.7%) had a canteen. Thirty schools (73%) had a canteen menu. Of the 17 schools (41.5%) with a cafeteria, 16 had a food menu available, and among these, 15 (93.8%) provided menus that complied with Ministry of Health regulations. None of the canteens offered fresh vegetables or dried fruit. However, fresh fruit juice was sold in eight schools (26%), and fresh fruit was available in 13 schools (43.3%). 36 schools (87.8%) offered physical education classes. A significant difference was observed between full-time and part-time schools regarding cafeteria availability ($p<0.001$). ***Conclusion:*** Overall, these findings suggest that regulatory frameworks have contributed to improvements in school nutrition and physical activity infrastructure, but practical adherence remains inconsistent.

Keywords: Nutrition, Exercise Opportunities, Kocaeli, Schools, Canteen, Cafeteria.

Research Paper

***Corresponding Author:**
Sefa Kazancı
MD. Private Corlu Optimed Hospital Tekirdag, Turkey

How to cite this paper:
Sefa Kazancı *et al* (2025). Evaluation of Nutrition and Exercise Opportunities in Schools in Kocaeli Province, Turkey. *Middle East Res J. Med. Sci*, *5*(6): 396-399.

Article History:
| Submit: 29.09.2025 |
| Accepted: 27.10.2025 |
| Published: 19.11.2025 |

1. INTRODUCTION

Childhood and adolescence are crucial periods for lifelong health, and schools serve as a strategic platform to support this through structured environments and policies. In many countries, children spend a significant portion of their waking hours in school. This makes school settings particularly effective for public health interventions [1, 2]. Here, nutrition and exercise opportunities serve as two pillars of school health promotion [1]. This paper argues that while supporting these opportunities is important, systematic evaluation of how schools provide them is essential for effective and equitable impact. "Nutrition opportunities" include formal nutrition education and access to healthier food (e.g., school meals, vending machines, snacks). "Exercise opportunities" include structured and informal physical activity: PE classes, recess, classroom breaks, extracurricular sports, and school design that supports movement [3, 4].

A considerable body of evidence has examined ways to improve both nutrition and physical activity in schools. For example, combining school meal or fruit and vegetable programs with physical activity initiatives can increase activity and improve diets. However, effects are often modest. This is partly due to implementation challenges, contextual barriers, and other competing priorities within schools. A randomized trial involving

both nutrition and exercise found limited effects on child weight. This highlights the difficulty in translating policy into practice [5–7].

Given this, promoting nutrition and physical activity in schools is not enough. We must also evaluate how well schools create opportunities for these behaviors. These opportunities should be equitable, well-resourced, and properly implemented. Systematic monitoring of nutrition and exercise options helps spot areas for improvement. Gaps can include limited PE time, poor food quality, or a lack of teacher training. Monitoring also allows comparisons across schools or regions. By evaluating opportunities, not just outcomes, policymakers can act more effectively and adjust environments before problems escalate. For example, the COM-PASS tool measures teacher capability, opportunity, and motivation to deliver physical activity in schools. Reviews of nutrition education programs from 2014 to 2024 emphasize the evaluation of not only content, but also fidelity, context, and sustainability. Without rigorous evaluation, programs risk being symbolic instead of sparking real change [8, 9].

In summary, the main argument is that pursuing both nutrition and physical activity initiatives in schools is supported by evidence. Yet, with significant variability among schools, a structured evaluation is necessary. This approach enables stakeholders to determine which schools provide effective nutrition and exercise environments and which do not.

The present study aims to evaluate the nutrition and exercise opportunities available in a sample of primary and secondary schools. The goal is to provide actionable insights that can inform tailored policy interventions and school health improvement plans.

2. MATERIAL AND METHODS

A total of 41 primary and secondary schools in Kocaeli were visited to document the foods available for sale. School cafeteria menus were systematically reviewed for compliance with Ministry of Health regulations. Information was also gathered regarding the availability of exercise areas and the existence of school sports teams. A structured survey form was developed to systematically evaluate the nutrition and exercise facilities of the schools.

Data collection was conducted during the 2015-2016 academic year at the selected schools, focusing on canteen lists, food menus, and exercise facilities. The study sample included both private and public schools in Kocaeli, selected through random sampling from a comprehensive list of all primary and secondary schools.

Statistical analyses were performed using IBM SPSS 20.0 software (SPSS Inc., Chicago, IL, USA). Numerical variables were reported as medians with interquartile ranges, as well as frequencies with corresponding percentiles. Differences between groups for categorical variables were assessed using Fisher's exact chi-square test, Yates' chi-square test, and the Monte Carlo chi-square test. A p-value less than 0.05 was considered statistically significant in two-sided tests.

3. RESULTS

Of the schools studied, 17 (41.5%) had a cafeteria and 38 (92.7%) had a canteen. Thirty schools (73%) had a canteen menu. Of 36,716 students, 3,315 (9.2%) used the canteen. Full-time education was offered in 31 schools (75.6%), and 10 (24.4%) offered half-time education.

To further assess school environments, we evaluated schools on their healthy eating practices. Of the 17 schools (41.5%) with a cafeteria, 16 had a food menu available, and among these, 15 (93.8%) provided menus that complied with Ministry of Health regulations.

Of the 38 schools with canteens, 30 provided a canteen list, and 22 (53.7%) offered informational materials and healthy eating buffets. Despite prohibitions, canteens continued to sell carbonated and high-calorie beverages, flavored soda, and fried foods.

Further details from the canteen assessments revealed that all canteens sold high-energy foods, such as toast, pastries, bagels, processed meats, candies, chocolate, cakes, biscuits, and wafers. Despite canteen regulations from the Ministry of National Education specifying conditions for selling these foods, no canteen displayed information confirming compliance with these regulations. Furthermore, none of the canteens offered fresh vegetables or dried fruit. However, fresh fruit juice was sold in eight schools (26%), and fresh fruit was available in 13 schools (43.3%).

In addition to food-related findings, a survey assessed the availability of exercise facilities in the schools. The results indicated that 36 schools (87.8%) offered physical education classes. Furthermore, 22 schools (53.7%) had indoor gyms, 27 (65.4%) provided outdoor sports fields, and 28 (68.3%) offered sports teams and folk dance teams.

Finally, the availability of cafeterias was analyzed by school year. A significant difference was observed between full-time and part-time schools regarding cafeteria availability ($p<0.001$).

4. DISCUSSION

This study evaluated the nutritional environment and physical activity opportunities of 41 primary and secondary schools in Kocaeli Province, Turkey. The results reveal both positive developments and persistent shortcomings in the implementation of health-promoting school environments. The methodology, which included systematic assessments of

canteen menus, cafeteria offerings, and sports facilities, provided a comprehensive perspective on the intersection between policy compliance and practice within school settings. Random sampling across public and private institutions ensured representative coverage, while the use of rigorous statistical analyses strengthened the reliability of the findings.

The high prevalence of canteens (92.7%) compared to cafeterias (41.5%) indicates that short-term food access is the dominant model in Turkish schools. This pattern is consistent with observations in other middle-income countries where space, infrastructure, and cost constraints limit cafeteria operations [10]. Although most cafeterias (93.8%) complied with Ministry of Health guidelines, the continued sale of high-calorie and sugary foods in canteens highlights the challenges of enforcing national nutrition regulations. Similar findings were observed in a cross-sectional analysis of schools in Istanbul, which reported frequent availability of energy-dense snacks despite regulatory bans [11]. These results suggest that effective policy implementation requires routine monitoring, nutrition education for vendors, and behavioral interventions targeting students' food choices.

The lack of vegetables and limited availability of fresh fruit in most canteens indicate a persistent nutritional imbalance. This trend is consistent with findings from school food environment assessments in other European and Mediterranean contexts, where exposure to high-energy snacks is common [12, 13]. The limited provision of fresh produce may result from factors such as higher spoilage risk, increased cost, and insufficient refrigeration, which have been identified as structural barriers in previous research [14]. The presence of fresh fruit or juice in some schools demonstrates incremental progress toward healthier food options.

Physical activity opportunities were well established in the participating schools. A total of 87.8% offered physical education courses, and more than half provided sports facilities or teams. This observation aligns with national data indicating that most Turkish schools allocate time in the curriculum for physical education. However, the quality and frequency of these activities vary [15]. International comparisons indicate that environmental support, such as safe outdoor play areas and gymnasiums, is a strong predictor of students' physical activity levels [16]. The presence of facilities alone does not ensure adequate exercise; active engagement and a supportive school culture are also essential.

Full-time schooling is significantly associated with greater cafeteria availability ($p < 0.001$), as longer school hours necessitate the provision of structured meals. This finding is consistent with results from comparable education systems, where extended school time increases demand for institutional food services (Kracht *et al*., 2020). Full-day programs also present opportunities to promote balanced meals and health education.

Overall, these findings suggest that regulatory frameworks have contributed to improvements in school nutrition and physical activity infrastructure, but practical adherence remains inconsistent. Addressing this issue requires a collaborative approach involving local health authorities, school administrations, parents, and food suppliers to enhance and sustain compliance. Future research should employ qualitative assessments of vendor motivations, student preferences, and parental influences to identify the key factors that affect compliance. Understanding these factors will help address the socio-behavioral reasons underlying compliance gaps.

Funding: None

Conflicts of Interest: There are no conflicts of interest.

REFERENCES

1. Shoesmith A, Hall A, Wolfenden L, Shelton RC, Powell BJ, Brown H, et al. Barriers and facilitators influencing the sustainment of health behaviour interventions in schools and childcare services: a systematic review. Implement Sci. 2021;16(1):62.
2. Mohammadi S, Koo HC. Editorial: School-based nutrition and physical activity interventions among children and adolescents. Front Public Heal [Internet]. 2025;Volume 13. Available from: https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2025.1585511
3. Brunsdon JJ. 'it's about bringing people together': one middle school physical education teacher's attempt at deploying character education. Phys Educ Sport Pedagog. 2025;30(5):508–20.
4. Goodyear VA, Skinner B, McKeever J, Griffiths M. The influence of online physical activity interventions on children and young people's engagement with physical activity: a systematic review. Phys Educ Sport Pedagog. 2023;28(1):94–108.
5. Buchanan LR, Wethington HR, Finnie RKC, Mercer SL, Merlo C, Michael S, et al. A Community Guide Systematic Review: School Dietary and Physical Activity Interventions. Am J Prev Med. 2023 Mar;64(3):441–51.
6. Barnes C, McCrabb S, Stacey F, Nathan N, Yoong SL, Grady A, et al. Improving implementation of school-based healthy eating and physical activity policies, practices, and programs: a systematic review. Transl Behav Med. 2021 Jul;11(7):1365–410.
7. Barnes C, Hall A, Nathan N, Sutherland R, McCarthy N, Pettet M, et al. Efficacy of a school-based physical activity and nutrition intervention on child weight status: Findings from a cluster

randomized controlled trial. Prev Med (Baltim) [Internet]. 2021;153:106822. Available from: https://www.sciencedirect.com/science/article/pii/S0091743521003911

8. Verdonschot A, Beauchamp MR, Brusseau TA, Chinapaw MJM, Christiansen LB, Daly-Smith A, et al. Development and evaluation of the Capability, Opportunity, and Motivation to deliver Physical Activity in School Scale (COM-PASS). Int J Behav Nutr Phys Act [Internet]. 2024;21(1):93. Available from: https://doi.org/10.1186/s12966-024-01640-4
9. Muzzioli L, Gimbo C, Pintavalle M, Migliaccio S, Donini LM. Evaluation of the Influence of Intervention Tools Used in Nutrition Education Programs: A Mixed Approach. Vol. 17, Nutrients. 2025.
10. Swinburn BA, Kraak VI, Allender S, Atkins VJ, Baker PI, Bogard JR, et al. The Global Syndemic of Obesity, Undernutrition, and Climate Change: The Lancet Commission report. Lancet [Internet]. 2019 Feb 23;393(10173):791–846. Available from: https://doi.org/10.1016/S0140-6736(18)32822-8
11. Yalçın B. Nutritional Assessment of Primary School Menus in Istanbul. Aydın Sağlık Derg. 2025;11(1):75–85.
12. Storcksdieck Genannt Bonsmann S, Kardakis T, Wollgast J, Nelson M, Caldeira S. Mapping of National School Food Policies across the EU28 plus Norway and Switzerland. 2014.
13. Fernández-Alvira JM, De Bourdeaudhuij I, Singh AS, Vik FN, Manios Y, Kovacs E, et al. Clustering of energy balance-related behaviors and parental education in European children: the ENERGY-project. Int J Behav Nutr Phys Act. 2013 Jan;10:5.
14. Merlo C, Smarsh BL, Xiao X. School Nutrition Environment and Services: Policies and Practices That Promote Healthy Eating Among K-12 Students. J Sch Health. 2023 Sep;93(9):762–77.
15. Temiz G, Kaya ÇA, Bahadır AE. Evaluation of Physical Activity, Nutrition Habits and Obesity Rates in the Students of Nutrition-Friendly Schools. Anatol J Fam Med. 2018;1(1):26.
16. Verloigne M, Van Lippevelde W, Maes L, Yıldırım M, Chinapaw M, Manios Y, et al. Levels of physical activity and sedentary time among 10- to 12-year-old boys and girls across 5 European countries using accelerometers: an observational study within the ENERGY-project. Int J Behav Nutr Phys Act. 2012 Mar;9:34.