Barriers to the Implementation of Healthy Food Policies in School Cafeterias: A Systematic Review

Muhammad Iqbal[1], Lutfiyah Rizqulloh[2], Firmansyah Kholiq Pradana[3]

{muhammadiqbal@dsn.dinus.ac.id[1], lutfiyah.rizqulloh@gmail.com[2], firmansyah.kholiq@dsn.dinus.ac.id[3]}

Public Health Program, Faculty of Health, Universitas Dian Nuswantoro, Indonesia[1,3]
Medical Records and Health Information Study Program, Politeknik Bina Trada[2], Semarang, Indonesia

Abstract. The school environment shapes children's dietary preferences and nutritional status. However, implementing healthy food policies in school cafeterias globally still faces various challenges. This systematic review aims to synthesize the latest evidence on the factors hindering these policies' implementation. Following the PRISMA protocol, this review analyzes 10 research articles identified from the PubMed and Scopus databases (2019-2025). The analysis results reveal that non-compliance with national guidelines is a persistent problem in various countries. The main barriers are multidimensional, including economic aspects such as the lower price of unhealthy foods, limited school capacity and human resources, the non-mandatory and complex nature of policies, the lack of monitoring and enforcement systems, student preferences, and external environmental influences. It was concluded that a systemic approach encompassing mandatory policies, resource support, pricing strategies, and nutrition education is necessary to create an effective and sustainable school food environment.

Keywords: school food policy, healthy cafeteria, implementation, obstacles

1 Introduction

The school environment plays a vital role in shaping children's food preferences and nutritional status. Recent research has shown that students spend about 30 hours per week at school and consume a large amount of food in the school environment, such as the cafeteria [1]. In Brazil, a longitudinal study revealed that exposure to school cafeterias dominated by ultra-processed foods was associated with a significant increase in body mass index (BMI) among adolescents over three years [2]. These findings are consistent with evidence from India, indicating that approximately 78% of foods sold in school cafeterias fall into the high-fat, high-sugar, and high-salt categories [3].

Many governments have implemented various school food regulations in response to this crisis. The European Union launched the EU School Fruit and Vegetables Scheme, while the United States updated its Smart Snacks Standards. However, an evaluation study of school food programs across all European Union (EU) countries found that the acceptance rate of school meals was low,

ICoPHI 2025, November 01, Padang, Indonesia

DOI 10.4108/eai.1-11-2025.2362921

as the reformulated menus did not meet nutritional standards and were poorly accepted due to issues related to taste, quality, and differing food preferences among students [4]. Research has found that, despite the presence of school food policies, their implementation was constrained by inadequate infrastructure, limited funding, insufficient capacity, and commercial pressures [5]. Studies conducted in Southeast Asia on creating a healthy food environment were influenced by various factors, with food prices and affordability most consistently identified as the main barriers to achieving healthy diets [6]. Research in Africa shows that single interventions that only provide nutritionally regulated snacks in schools cannot promote a healthy school food environment. A multisectoral approach and awareness building among all stakeholders, including parents, are needed. In addition, systematic evidence emphasizes that the lack of consistent monitoring and enforcement constitutes a significant obstacle in most schools [8].

Therefore, this systematic review is crucial for synthesizing the latest evidence on barriers to implementing healthy school food policies. A comprehensive understanding of these multidimensional challenges will provide an evidence-based foundation for developing effective and sustainable intervention strategies, which can ultimately create a school food environment that supports the younger generation's health and breaks the cycle of childhood obesity.

2 Method

2.1 Research Design

This study is a systematic literature review to identify, evaluate, and synthesize scientific evidence on factors that hinder the implementation of healthy food policies in school canteens. To ensure a comprehensive process, this systematic review was conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol.

2.2 Search Strategy

The literature search was conducted on two indexed electronic databases, PubMed and Scopus, with a publication time range from 2019 to 2024. The keywords used were grouped into three main categories using Boolean operators (AND, OR): ("healthy canteen" OR "school canteen policy" OR "school food policy" OR "healthy school policy" OR "school-based nutrition policy") AND ("secondary school" OR "high school" OR "senior high school" OR "adolescent") AND ("nutrition" OR "healthy eating" OR "food environment" OR "health promotion")

2.3 Inclusion and Exclusion Criteria

Inclusion criteria were empirical studies (observational, survey, or policy evaluation, focusing on implementing healthy food policies in schools, published in English, available in full text). Exclusion criteria were studies that did not focus on healthy food policies in schools.

2.4 Data Selection and Extraction Process

The selection process follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. After removing duplicates, articles were screened based on their titles and abstracts, and then eligibility was assessed through a full-text review.

Analysis of Results

The extracted data were analyzed narratively and presented in a synthesis table. Barriers were grouped into main themes based on conceptual similarities to facilitate interpretation and discussion. Figure 1 shows the PRISMA flow diagram summarizing the eligibility and selection process.

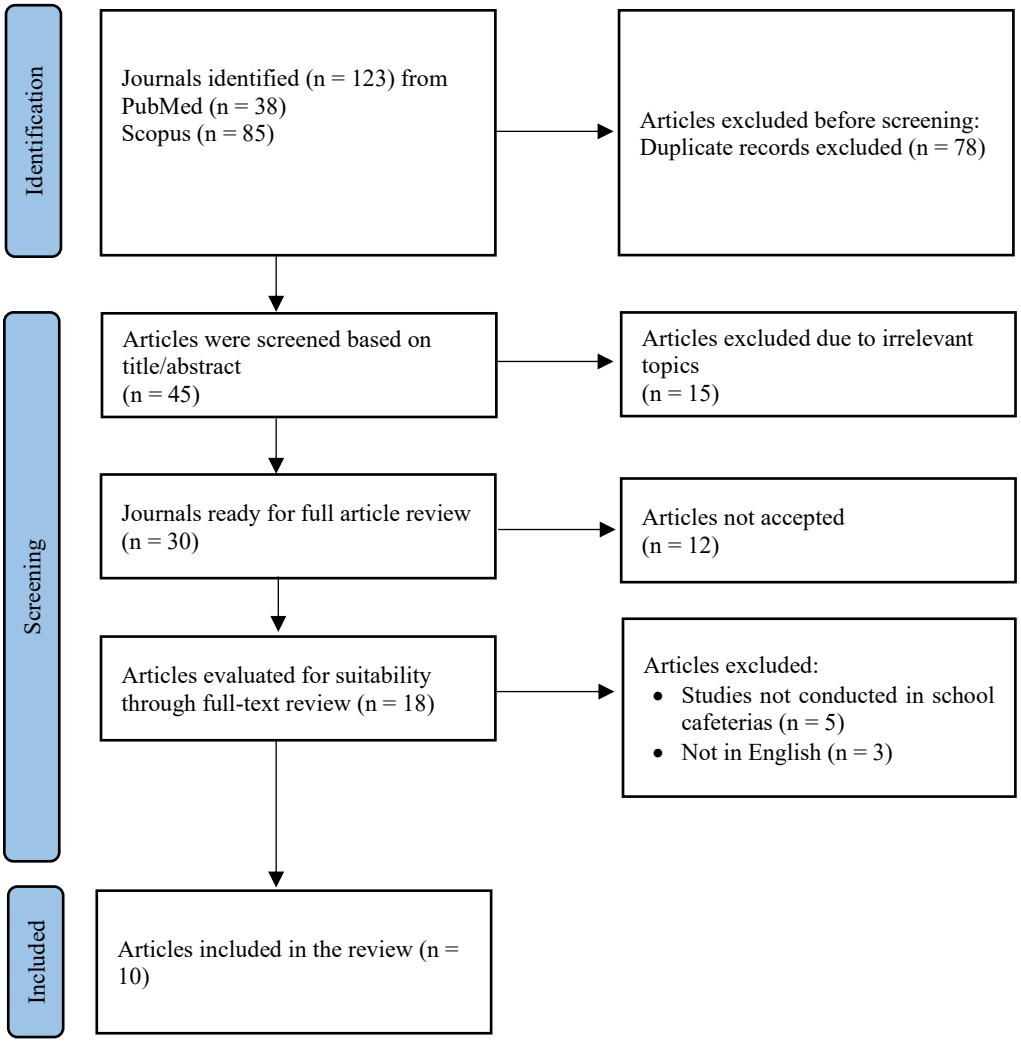

Figure 1. PRISMA diagram

3 Results

Based on a systematic analysis of ten journal articles on healthy food policies in school cafeterias, the main findings reveal that non-compliance with national guidelines is a common problem in various countries, regardless of their economic status. Almost all studies report low availability of healthy food options and a high proportion of foods and beverages classified as "unhealthy" or "prohibited" in school settings [9], [10], [11]. In Australia, for example, two separate studies found that almost all schools offered "red" (unhealthy) items, and very few met the target of having a majority of their menu consist of "green" (healthy) items [9], [10]. A similar pattern was seen in the UK, where compliance with School Food Standards (SFS) averaged only 63.9%, with the lowest compliance rates for standards limiting foods high in fat, sugar, and salt [11]. A summary of the studies can be seen in Table 1.

Table 1. Study Summary

No	Author	Title	Country	Method	Research Subject	Results
1.	Cohen et al., 2024 [12]	Nutritional Quality of Competitive Foods and Compliance with Smart Snacks Standards: An Analysis of a National Sample of U.S. Middle and High Schools	United States	Cross-sectional observational study	The subjects of the study were middle and high schools in the United States, consisting of 90 randomly selected schools.	Overall, 75% of all competitive food and beverage products offered in schools comply with Smart Snacks standards. The highest compliance was found in fruits and vegetables (100%), yogurt and cheese (89%), and ice cream and frozen foods (78%), while salty foods (41%) and sweet foods (43%) had the lowest compliance. Compliance was significantly higher when competitive foods were supervised by the school food service department (77% compliant) compared to when supervised by other parties such as student organizations or outside vendors (59% compliant).
2.	Pallan et al, 2024 [11]	National school food standards in England: a cross-sectional study to explore compliance in secondary schools and impact on	England	Cross-sectional study using observational and quantitative survey approaches	36 secondary schools in the Midlands region (23 non-compulsory and 13 compulsory) meet the School Food Standards (SFS) with a total	This study evaluates the level of compliance of secondary schools with School Food Standards (SFS) and the relationship between the level of compliance and

No	Author	Title	Country	Method	Research Subject	Results
		pupil nutritional intake			of 2,273 students aged 11–15 years old.	students' nutritional intake. The average compliance with SFS was only 63.9%, with the highest level of compliance being for school lunch standards (81.3%) and the lowest for standards for the entire school day (41.7%). Schools were more compliant with standards that encouraged healthy food variety (92.3%) than with those that restricted foods high in fat, sugar, and energy (26.1%). Stronger support and monitoring systems are needed for school food policies to be effective in improving adolescent nutritional intake.
3.	Park et al, 2023 [13]	The frequency of convenience food consumption and attitude of sodium and sugar reduction among middle and high school students in Seoul: a descriptive study	South Korea	Descriptive study using an online questionnaire	75 junior high and high school students in Seoul (14 junior high school students and 61 high school students)	Most students visit convenience stores 3–5 times per week, especially on weekdays during lunch and dinner. Although students are aware of the importance of reducing sugar and salt intake, they rarely check the sodium and sugar information on food labels. Groups with high consumption frequency tend to consume more high-sugar foods such as chocolate and soda. Compliance with the Ministry of Health's dietary guidelines remains low
4.	Hill et al., 2023 [10]	How healthy and affordable are foods and beverages sold in school canteens? A cross-sectional	Australia	Cross-sectional study	The research subjects were canteen menus from primary schools. The sample consisted	The results of the study show that the average composition of cafeteria menus is 21% green, 53% yellow, 25% red, and

No	Author	Title	Country	Method	Research Subject	Results
		study comparing menus from Victorian primary schools			of 48 primary schools in Victoria. A total of 1,818 menu items were analyzed.	2% black. Not a single school meets the government guidelines for having a majority (>50%) of green items. Red (unhealthy) items are significantly cheaper than green items for the main food category (on average $0.48 cheaper). About half of the schools offer red items at lower prices or do not offer green alternatives at all. These findings highlight widespread non-compliance with guidelines and price barriers to healthy food choices in Victoria primary school cafeterias.
5.	Chote et al., 2022 [14]	Culture of Healthy Eating and Food Environments, Policies, and Practices in Regional New Zealand Schools	New Zealand	A cross-sectional study using the School-FERST online survey and policy analysis with the Policy-FANS tool. The survey measured food policies, food provision, and healthy eating culture in schools	51 schools (primary and secondary) in the Hawke's Bay region	A total of 58.8% of schools have healthy food policies, but most are still weak in their implementation. Schools with the "Ka Ora, Ka Ako" free lunch program demonstrate a stronger healthy eating culture. The main obstacles to implementing a healthy eating culture are the presence of fast food outlets around schools and student resistance to change. Secondary schools face more challenges than primary schools. This study emphasizes the need for stronger school policies ( ), detailed implementation guidelines, and periodic evaluations to create a healthy food environment in schools.

No	Author	Title	Country	Method	Research Subject	Results
6.	Evenhuis et al, 2022 [15]	The Effect of Supportive Implementation of Healthier Canteen Guidelines on Changes in Dutch School Canteens and Student Purchase Behavior	Netherlands	Quasi-experimental study over 6 months (10 intervention schools and 10 control schools)	Students aged 13–15 years (approximately 1,376 students) from secondary schools in western and central Netherlands	Schools that received implementation support showed a significant increase in the provision of healthy foods and beverages in the cafeteria (77.2%) and ease of access to healthy options (59.0%) compared to the control group (60.1% and 50.0%). However, no significant changes were found in students' purchasing behavior toward healthy foods during the intervention period. Nevertheless, the intervention succeeded in improving the healthiness of school cafeterias and strengthening the implementation of the Guidelines for Healthier Canteens
7.	Okeyo et al, 2020 [16]	The Food and Nutrition Environment at Secondary Schools in the Eastern Cape, South Africa as Reported by Learners	South Africa	Cross-sectional design	A total of 1360 students from 16 public secondary schools in three health districts in the Eastern Cape	The findings revealed a double burden of malnutrition, with 36.1% of adolescent girls and 9.9% of boys being overweight or obese, while 13.3% of boys and 5.5% of girls were underweight. Students' nutritional knowledge was generally poor, and most teachers had no formal nutrition training and were unfamiliar with the national Food-Based Dietary Guidelines (FBDGs). Although the National School Nutrition Program (NSNP) reached 96% of students, the quality of food and implementation of

No	Author	Title	Country	Method	Research Subject	Results
						nutrition education needed improvement. The overall school food environment was not conducive to healthy eating.
8.	Haynes et al, 2021 [9]	Secondary school cafeterias in Australia: analysis of cafeteria menus from a repeated cross-sectional national survey	Australia	Repeated cross-sectional survey design	The research subjects were secondary school canteen menus. The sample consisted of 244 Australian secondary schools that participated in two waves of national surveys (148 schools in 2012-2013 and 96 schools in 2018).	The results of the study show that, on average, 50.7% of menu items are classified as green, 30.2% as yellow, and 19.1% as red. Almost all schools (98.5%) offer at least one red item, which is contrary to the national guidelines. Snacks and drinks have the least healthy nutritional profiles compared to other product sectors. Red items are significantly cheaper than green items. These findings highlight the need for significant improvements in the availability, pricing, and promotion of healthier options, as well as the need for stronger policy support and enforcement.
9.	Vine et al, 2021 [17]	Secondary School Nutrition Policy Compliance in Ontario and Alberta, Canada: A Follow-Up Study Examining Vending Machine Data from the COMPASS Study	Canada	Longitudinal study	The subjects of the study were secondary schools (grades 9-12) in Ontario and Alberta that participated in the COMPASS study. The sample consisted of 50 schools in Ontario and 5 schools in Alberta that had complete data for longitudinal analysis from Year 4 to Year 7.	Longitudinal results show that most vending machines for snacks and beverages remained non-compliant between 2015/2016 and 2018/2019 in both provinces. The study concluded that non-compliance with school nutrition policies remained common years after implementation, highlighting the need for policy simplification, training, enforcement,

No	Author	Title	Country	Method	Research Subject	Results
						and better monitoring to improve compliance, particularly in Alberta where the policy is voluntary.
10.	Marro et al, 2019 [18]	School Food Policies Related to Soft Drink and Fruit Juice Consumption as a Function of Education Type in Flanders, Belgium	Belgium	Cross-sectional design with a quantitative approach	The research subjects were secondary schools in Flanders, namely 69 high schools and 91 vocational schools	Overall, only 44% of schools had written policies related to soft drink consumption. Policies that explicitly prohibited or restricted acidic beverages (soft drinks and fruit juices) were significantly more common in high schools than in vocational schools. Factor analysis (MFA) confirmed the existence of two distinct clusters: one dominated by high schools with higher socioeconomic status and stricter policies, and another dominated by vocational schools with lower socioeconomic status and more lenient policies.

The factors that influence the implementation of this healthy food policy can be grouped into several categories, namely:

1. Policy and Systemic Factors
   The existence and nature of the policy itself are determining factors. Mandatory policies have higher implementation rates than voluntary ones [11], [17]. For example, persistent noncompliance with school nutrition policies in Alberta, Canada, has been linked to the voluntary nature of the policy [17]. In addition, the complexity of the policy is also an obstacle, where schools are more compliant with standards that encourage healthy variety than standards that restrict unhealthy foods, which are considered more complicated to implement [11]. The lack of effective monitoring and enforcement systems is also consistently cited as a significant obstacle in ensuring long-term compliance [11], [14], [16].
2. Economic and Market Factors
   Economic aspects play a critical role. Price is a significant barrier, with unhealthy food items consistently cheaper than healthy alternatives in school canteens [9], [10]. This makes healthy choices less affordable for students. In New Zealand, the presence of fast

food outlets near schools has been reported as a significant obstacle to creating a culture of healthy eating in schools [14]. Studies in South Africa also highlight that although national lunch programs reach many students, the food quality still needs to be improved [16].

3. School Capacity and Human Resources
   School capacity and resources greatly influence the success of implementation. Active implementation support, such as guidance from public health officers or supporting organizations, has significantly improved compliance and the quality of food offered [12], [15]. Conversely, a lack of training and knowledge about nutrition among school staff and cafeteria managers is a common obstacle [14], [16]. School level also plays a role, with secondary schools often facing more challenges than elementary schools, including greater student resistance [14].
4. Social and Behavioral Factors
   Social and behavioral factors within the school community, particularly among students, cannot be ignored. Students' preferences and demand for unhealthy foods pressure cafeterias to continue offering these products to remain attractive and profitable [9], [13]. Students' knowledge, attitudes, and behaviors are also necessary. A study in South Korea found that although students recognize the importance of reducing sugar and salt, this is rarely translated into the behavior of checking food labels [13]. Support from the entire school community, including the involvement of principals, teachers, parents, and students, is a key element in creating a sustainable, healthy eating culture [14].
5. Socioeconomic and Geographic Factors
   Socioeconomic and geographic disparities are also reflected in the school food environment. Several studies have found that schools in less affluent areas tend to have lower compliance with healthy guidelines and are more likely to offer unhealthy foods [10], [18]. In Belgium, vocational schools (SMK) with lower socioeconomic status have more lenient policies on sugary drinks than general schools (SMA) [18]. In addition, schools in specific regional centers are reported to have a higher proportion of "prohibited" items [10].

4 Discussion

The synthesis of ten research articles reveals that non-compliance with healthy school food policies is a systemic and persistent problem transcending geographical boundaries and national income levels. These findings are consistent with previous literature showing that policies alone are not sufficient to ensure the transformation of the school food environment [19]. This study reinforces the evidence that the gap between policy and practice is vast, with the majority of schools in Australia, the United Kingdom, Canada, and Belgium failing to meet their national standards fully [9], [11], [17], [18].

More deeply, this analysis identifies several key interrelated factors that hinder effective implementation. Economic and commercial aspects emerge as particularly significant barriers. Consistent with previous findings, unhealthy foods are significantly cheaper than healthy foods [20]. This price disparity creates perverse incentives for price-sensitive students and cafeterias operating under financial pressure to maintain profitability. This is exacerbated by a competitive external food environment, where fast food outlets near schools, as reported in New Zealand [14], make it difficult for schools to compete and maintain their commitment to nutritional standards.

In addition, limited school capacity and resources have proven to be critical determining factors. Findings that active implementation support can significantly improve compliance and food quality [12], [15] are consistent with evidence highlighting the critical role of multi-component external support in the successful implementation of public health policies [21]. Conversely, the lack of formal nutrition training for school staff and cafeteria managers [16], as in South Africa, reflects a common capacity gap. These challenges are often greater in secondary schools, which may face greater operational complexities and higher student resistance [14], indicating the need for different approaches according to school level.

Policy and systemic factors themselves also contribute to implementation challenges. Evidence from Canada [17] and the United Kingdom [11] shows that mandatory policies are associated with higher levels of compliance, although not perfect. However, the complexity of policies, especially those involving restrictions on certain foods, can be a barrier, as seen in the United Kingdom, where schools are more compliant with standards that promote healthy foods than those that restrict unhealthy foods [11]. This shows that guidelines need to be strict, practical, and easy to implement. Furthermore, the lack of strong and sustained monitoring and enforcement systems reported in some jurisdictions is a major systemic weakness [11], [16], allowing non-compliance to continue without consequences.

In addition, social dimensions and disparities cannot be ignored. Schools in disadvantaged areas and vocational schools have lower compliance and less healthy food environments [10], [18], potentially exacerbating health inequalities. These findings are consistent with research highlighting disparities in school food environments based on socioeconomic characteristics [22]. Students' established preferences for foods high in sugar, salt, and fat, as seen in Korea [13], create a challenging demand environment for cafeterias seeking to shift to healthier options, emphasizing the need for nutrition education interventions and behavioral change alongside food supply reforms.

Overall, this discussion emphasizes that the success of school food policies depends on an integrated systemic approach. Mandatory and clear guidelines must be supported by adequate resource allocation for implementation support, strategies to address price disparities (such as subsidies for healthy foods), capacity building through training, and strong monitoring and accountability systems. Without addressing these interrelated factors, school food policies will continue to struggle to change the food environment and, ultimately, school children's consumption patterns and nutritional status.

5 Conclusions

Based on a synthesis of ten research articles, it was concluded that implementing healthy food policies in school cafeterias globally is still ineffective, with non-compliance with national guidelines being a persistent problem. The main challenges are multidimensional, including economic factors such as the lower price of unhealthy foods, limited school capacity, lack of implementation support and training, the non-mandatory nature of the policy, as well as student preferences and socioeconomic disparities. Therefore, the future success of this policy requires a systemic approach that includes mandatory policies with strong monitoring, adequate resource support, pricing strategies that support healthy foods, and ongoing nutrition education to create a school food environment that genuinely supports student health.

References

[1] S. B. Aychiluhm, U. K. Mondal, V. Isaac, A. G. Ross, and K. Y. Ahmed, "Interventions for Childhood Central Obesity," *JAMA Netw Open,* vol. 8, no. 4, p. e254331, Apr. 2025, doi: 10.1001/jamanetworkopen.2025.4331.

[2] S. B. Mescoloto, G. Pongiluppi, and S. M. Á. Domene, "Ultra-processed food consumption and children and adolescents' health," J *Pediatr (Rio J),* vol. 100, pp. S18–S30, Mar. 2024, doi: 10.1016/j.jped.2023.09.006.

[3] B. P. Singh and M. Sharma, "Nutritional Status of School Going Children in India: A Review," *International Journal of Medical Research & Health Sciences*, vol. 10, no. 10, pp. 130–138, 2021, [Online]. Available: www.ijmrhs.com

[4] N. Blecha *et al.*, "Evaluation of school food policies for secondary schools in Europe: Results for health, acceptance, and affordability from a scoping review," *Obesity Reviews*, vol. 26, no. 7, Jul. 2025, doi: 10.1111/obr.13911.

[5] R. Ronto, N. Rathi, A. Worsley, T. Sanders, C. Lonsdale, and L. Wolfenden, "Enablers and barriers to implementation of and compliance with school-based healthy food and beverage policies: a systematic literature review and meta-synthesis," *Public Health Nutrition*, vol. 23, no. 15, pp. 2840–2855, Oct. 2020, doi: 10.1017/S1368980019004865.

[6] J. Gaupholm, A. Papadopoulos, A. Asif, W. Dodd, and M. Little, "The influence of food environments on dietary behavior and nutrition in Southeast Asia: A systematic scoping review," *Nutr Health*, vol. 29, no. 2, pp. 231–253, Jun. 2023, doi: 10.1177/02601060221112810.

[7] F. Bekker, M. Marais, and N. Koen, "The provision of healthy food in a school tuck shop: Does it influence primary-school students' perceptions, attitudes and behaviors towards healthy eating?," *Public Health Nutr*, vol. 20, no. 7, pp. 1257–1266, May 2017, doi: 10.1017/S1368980016003487.

[8] D. C. Lee *et al.*, "Strategies for enhancing the implementation of school-based policies or practices targeting diet, physical activity, obesity, tobacco or alcohol use," *Cochrane Database of Systematic Reviews*, vol. 2024, no. 12, Dec. 2024, doi: 10.1002/14651858.CD011677.pub4.

[9] A. Haynes *et al.*, "Secondary school canteens in Australia: Analysis of canteen menus from a repeated cross-sectional national survey," *Public Health Nutr*, vol. 24, no. 4, pp. 696–705, Mar. 2021, doi: 10.1017/S1368980020003535.

[10] A. Hill *et al.*, "How healthy and affordable are foods and beverages sold in school canteens? A cross-sectional study comparing menus from Victorian primary schools," *Public Health Nutrition,* vol. 26, no. 11, pp. 2559–2572, Nov. 2023, doi: 10.1017/S136898002300126X.

[11] M. Pallan *et al.*, "National school food standards in England: a cross-sectional study to explore compliance in secondary schools and impact on pupil nutritional intake," *International Journal of Behavioral Nutrition and Physical Activity*, vol. 21, no. 1, Dec. 2024, doi: 10.1186/s12966-024-01672-w.

[12] J. F. W. Cohen *et al.*, "Competitive Foods' Nutritional Quality and Compliance with Smart Snacks Standards: An Analysis of a National Sample of U.S. Middle and High Schools," *Nutrients*, vol. 16, no. 2, Jan. 2024, doi: 10.3390/nu16020275.

[13] S. Park, Y. Shin, S. Lee, and H. Park, "The frequency of convenience food consumption and attitude of sodium and sugar reduction among middle and high school students in Seoul: a descriptive study," *Korean Journal of Community Nutrition,* vol. 28, no. 4, pp. 269–281, Aug. 2023, doi: 10.5720/kjcn.2023.28.4.269.

[14] B. Chote, P. McKelvie-Sebileau, B. Swinburn, D. Tipene-Leach, and E. D'souza, "Culture of Healthy Eating and Food Environments, Policies, and Practices in Regional New Zealand Schools," *Int J Environ Res Public Health,* vol. 19, no. 11, Jun. 2022, doi: 10.3390/ijerph19116729.

[15] I. J. Evenhuis *et al.*, "The effect of supportive implementation of healthier canteen guidelines on changes in Dutch school canteens and student purchase behavior," *Nutrients*, vol. 12, no. 8, pp. 1–16, Aug. 2020, doi: 10.3390/nu12082419.
[16] A. P. Okeyo, E. Seekoe, A. de Villiers, M. Faber, J. H. Nel, and N. P. Steyn, "The food and nutrition environment at secondary schools in the Eastern Cape, South Africa as reported by learners," *Int J Environ Res Public Health*, vol. 17, no. 11, pp. 1–18, Jun. 2020, doi: 10.3390/ijerph17114038.
[17] M. M. Vine *et al.*, "Secondary school nutrition policy compliance in Ontario and Alberta, Canada: A follow-up study examining vending machine data from the compass study," *Int J Environ Res Public Health*, vol. 18, no. 7, Apr. 2021, doi: 10.3390/ijerph18073817.
[18] F. Marro, P. Bottenberg, W. Jacquet, and L. Martens, "School food policies related to soft drink and fruit juice consumption as a function of education type in Flanders, Belgium," *Int J Environ Res Public Health*, vol. 16, no. 15, Aug. 2019, doi: 10.3390/ijerph16152718.
[19] C. Brown, S. Shaibu, S. Maruapula, L. Malete, and C. Compher, "Perceptions and attitudes towards food choice in adolescents in Gaborone, Botswana," *Appetite,* vol. 95, pp. 29–35, Dec. 2015, doi: 10.1016/j.appet.2015.06.018.
[20] N. Billich *et al.*, "The relative price of healthy and less healthy foods available in Australian school canteens," *Health Promot Int*, vol. 34, no. 4, pp. 677–686, Aug. 2019, doi: 10.1093/heapro/day025.
[21] L. Wolfenden *et al.*, "Strategies to improve the implementation of healthy eating, physical activity and obesity prevention policies, practices or programmes within childcare services," *Cochrane Database of Systematic Reviews*, vol. 2020, no. 2, Feb. 2020, doi: 10.1002/14651858.CD011779.pub3.
[22] M. Story, L. Miller, and M. Lott, "The School Nutrition and Meal Cost Study-I: Overview of Findings Related to Improving Diet Quality, Weight, and Disparities in US Children and Policy Implications," *Nutrients,* vol. 13, no. 4, p. 1357, Apr. 2021, doi: 10.3390/nu13041357.