



Implementation of vegetable consumption education in the Elementary School curriculum: A case study G7KAIH program

Implementasi edukasi konsumsi sayur dalam kurikulum Sekolah Dasar: Studi kasus program G7KAIH

Deris Aprianty¹, Drajat Martianto^{2*}, Ali Khomsan³, Yayuk Farida Baliwati⁴

¹ Department of Nutrition, Faculty of Medicine and Nutrition, Institut Pertanian Bogor, West Java, and Department of Nutrition, Tasikmalaya Health Polytechnic, West Java, Indonesia. E-mail: derisaprianty@apps.ipb.ac.id

² Department of Nutrition, Faculty of Medicine and Nutrition, Institut Pertanian Bogor, West Java, Indonesia. E-mail: dmartianto@apps.ipb.ac.id

³ Department of Nutrition, Faculty of Medicine and Nutrition, Institut Pertanian Bogor, West Java, Indonesia. E-mail: khomsanali@apps.ipb.ac.id

⁴ Department of Nutrition, Faculty of Medicine and Nutrition, Institut Pertanian Bogor, West Java, Indonesia. E-mail: baliwati@apps.ipb.ac.id

*Correspondence Author:

Department of Nutrition, Faculty of Medicine and Nutrition, Institut Pertanian Bogor, West Java, Indonesia. E-mail: dmartianto@apps.ipb.ac.id

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Abstract

Low vegetable consumption among elementary school students in Indonesia persists despite the national policy implemented through the “Gerakan 7 Kebiasaan Anak Indonesia Hebat (G7KAIH).” Previous studies have primarily examined nutritional intake outcomes, whereas limited attention has been paid to how vegetable consumption education policies are translated into classroom practice. This study aimed to analyze the integration of vegetable consumption education into the elementary school curriculum through G7KAIH and identify the implementation factors affecting learning practices and vegetable consumption habituation. A descriptive qualitative case study was conducted at a public elementary school in Tasikmalaya City, Indonesia, from October to December 2025. Data were collected through in-depth interviews and focus group discussions with education officials, school principals, teachers, and a nutritionist. Plate waste was identified through student consumption monitoring and simple recording of food waste at school. Data were analyzed thematically using Edward III’s policy-implementation framework. The findings indicate that policy communication was formally conducted but was not supported by operational guidelines, teacher capacity, or a clear implementation structure. Consequently, vegetable consumption education remained largely administrative and was not fully operationalized in daily learning processes. In conclusion, plate waste may serve as a behavioral indicator reflecting the translation of educational policy messages into classroom practice and students’ eating behaviors.

Keywords: Curriculum integration, G7KAIH, plate waste, policy implementation, vegetable consumption education

Abstrak

Rendahnya konsumsi sayur pada siswa sekolah dasar di Indonesia masih terjadi meskipun telah terdapat kebijakan nasional melalui Gerakan Tujuh Kebiasaan Anak Indonesia Hebat (G7KAIH). Penelitian sebelumnya lebih banyak berfokus pada luaran konsumsi gizi, sedangkan kajian tentang penerjemahan kebijakan edukasi konsumsi sayur ke dalam praktik pembelajaran di sekolah dasar masih terbatas. Penelitian bertujuan menganalisis integrasi edukasi konsumsi sayur dalam kurikulum sekolah dasar melalui program G7KAIH serta mengidentifikasi faktor implementasi yang memengaruhi praktik pembelajaran dan pembiasaan konsumsi sayur. Penelitian menggunakan desain studi kasus deskriptif kualitatif di salah satu sekolah dasar negeri di Kota Tasikmalaya, Indonesia, pada Oktober–Desember 2025. Data dikumpulkan melalui wawancara mendalam dan diskusi kelompok terarah dengan pejabat dinas pendidikan, kepala sekolah, guru, dan ahli gizi. *Plate waste* diidentifikasi melalui pemantauan konsumsi siswa dan pencatatan sederhana sisa makanan di sekolah. Data dianalisis secara

tematik menggunakan kerangka implementasi kebijakan Edward III. Hasil, komunikasi kebijakan telah berlangsung secara formal, tetapi belum didukung pedoman operasional, kapasitas guru, dan struktur implementasi yang jelas. Akibatnya, integrasi edukasi konsumsi sayur cenderung berhenti pada tingkat administratif dan belum sepenuhnya dioperasionalkan dalam pembelajaran sehari-hari. Kesimpulan, *plate waste* dapat menjadi indikator perilaku yang merefleksikan penerjemahan pesan kebijakan ke dalam praktik pembelajaran dan perilaku makan siswa.

Kata Kunci: Edukasi konsumsi sayur, G7KAIH, implementasi kebijakan, integrasi kurikulum, *plate waste*

Introduction

Vegetable consumption among elementary school children remains below the balanced nutrition recommendations, both globally and in Indonesia. This pattern is concerning because inadequate vegetable intake has been associated with an increased risk of overweight and obesity among children (Elsahoryi et al., 2025; Poelman et al., 2022; Tambalis et al., 2025). In Indonesia, most school-aged children do not meet the recommended fruit and vegetable intake. This problem is also evident in Tasikmalaya City, where the average vegetable intake among children has been reported to be only 30.90 ± 63.87 g/day (Kementerian Kesehatan Republik Indonesia, 2023; Nuraeni et al., 2023). Low vegetable consumption is shaped by individual and environmental factors, including children's knowledge of and attitudes toward vegetables and support from school and family environments (Fadilah & Ekayanti, 2023; Silva et al., 2021; Steen et al., 2018).

Schools have increasingly been recognized as strategic settings for promoting healthy eating behaviors, particularly through integrating vegetable consumption education into the curriculum. Evidence from several countries indicates that curriculum-based nutrition education, cooking classes, and school-based interventions can improve students' nutrition knowledge, food preferences, and healthy eating behaviors (Horst et al., 2024; Ili et al., 2022; Muzaffar et al., 2018; Wang & Young, 2021; Yazew et al., 2024). The elementary school context is especially important because school age is a formative period for the development of eating habits and food preferences that may persist into adolescence and adulthood. At this stage, schools function not only as academic learning environments but also as social settings in which eating behaviors are shaped through

instruction, habituation, and food provision. These findings underscore the role of schools as critical arenas for implementing health policies and vegetable consumption education, where interactions among classroom learning, the school environment, and students' eating practices occur directly at the implementation level.

In Indonesia, the government has introduced the Seven Habits of Great Indonesian Children Movement (Gerakan 7 Kebiasaan Anak Indonesia Hebat [G7KAIH]) in alignment with the Merdeka Curriculum, which emphasizes contextual learning and character development. One of the key focuses of this program is the habituation of healthy and nutritious food consumption in students' daily activities. In addition, the Free Nutritious Meal Program (Makan Bergizi Gratis [MBG]) was developed to strengthen the habituation of healthy food consumption within the school environment. Operationally, these two programs intersect because both position schools as environments for shaping students' healthy eating behaviors through learning activities and daily practices.

Previous studies have shown that the implementation of G7KAIH at the school level contributes to character formation and habituation of healthy behaviors among students, although challenges remain regarding implementation consistency and stakeholder engagement (Insani & Taufiq, 2025; Zuliana & Sumanto, 2025). However, most prior studies have focused primarily on nutritional intake outcomes and changes in student behavior, while limited attention has been given to how national policies are translated into formal learning practices in elementary schools. Moreover, previous implementation studies have generally treated schools as intervention sites rather than policy implementation arenas involving implementers' interpretation,

organizational capacity, and school bureaucratic structures (Bagus et al., 2024).

This gap indicates that the implementation of vegetable consumption education is influenced not only by the existence of formal policy but also by how such policy is translated into learning practices and healthy eating habits at the school level. Therefore, this study applies Edward III's policy implementation framework, which emphasizes communication, resources, implementer disposition, and bureaucratic structure as key factors influencing policy implementation (Edwards III, 1980; Setyawan et al., 2021). This framework is appropriate for explaining the relationship between policy design, organizational capacity, and implementation practices at the level of school-based implementers.

Unlike previous studies, this study positions vegetable consumption education as part of the policy implementation process in the elementary school curriculum. It also contributes to the literature by conceptualizing plate waste not only as a nutritional or food leftover indicator but also as an implementation indicator that reflects the extent to which vegetable consumption education messages are translated into classroom practice and students' eating behavior at schools. In this context, high plate waste may indicate a gap among policy communication, instructional practice, and students' acceptance of vegetable consumption. Plate waste has been used in various school-based studies as an evaluation indicator to assess the extent to which nutrition interventions and school meal programs are translated into students' actual consumption behavior (Adjapong et al., 2024; Kropp et al., 2017).

This study aimed to analyze the implementation of vegetable consumption education integration into the elementary school curriculum through the G7KAIH program and identify the implementation factors that influence learning practices and habituation of vegetable consumption in elementary schools.

Methods

Study Design and Setting

This study employed a qualitative approach with a descriptive case study design to explore the implementation of integrated vegetable consumption education within the elementary

school curriculum through the Seven Habits of Great Indonesian Children Movement (Gerakan 7 Kebiasaan Anak Indonesia Hebat [G7KAIH]).

The study was conducted at the Gunung Pereng 1 Public Elementary School in Tasikmalaya City, West Java, Indonesia. The school was selected purposively because it represented an urban public elementary school that actively implemented G7KAIH and was one of the target schools for the Free Nutritious Meal Program (Makan Bergizi Gratis [MBG]) in the city. In addition, the school had characteristics relevant to exploring the integration of vegetable consumption education into classroom learning and healthy eating habituation practices in the school environment. Data will be collected from October to December 2025.

Participants

Seven participants were involved in this study, comprising one key official from the Tasikmalaya City Education Office, namely the Head of the Elementary School Development Division; one school principal; four subject teachers responsible for Natural and Social Sciences (Ilmu Pengetahuan Alam dan Sosial [IPAS]), Indonesian Language, Physical Education, Sports, and Health (Pendidikan Jasmani, Olahraga dan Kesehatan [PJOK]), and Islamic Religious Education (Pendidikan Agama Islam [PAI]); and one nutritionist from the Nutrition Fulfillment Service Unit (Satuan Pelayanan Pemenuhan Gizi [SPPG]).

Participants were selected using purposive sampling based on their direct involvement in program implementation and integration of vegetable consumption education at the school level. The number of participants was considered adequate because the data showed repetition of information, and no new themes emerged in the final stage of data collection, indicating data saturation, particularly regarding policy communication, implementation capacity, and learning integration in schools.

Data Collection

Data were collected through in-depth interviews and focus group discussions (FGDs). An in-depth interview was conducted with a key official from the Education Office to represent the perspective of local policymakers.

The FGD involved the school principal, teachers, and a nutritionist to explore the program's implementation experiences at the

school level. The FGD was facilitated by the principal investigator as the moderator and supported by one research assistant who served as a note-taker and documentation coordinator. The discussion lasted 45–60 minutes and was conducted offline using a semi-structured discussion guide covering policy communication, learning integration, resources, healthy eating habituation practices, and student consumption monitoring mechanisms implemented at the school, including simple recording practices for food leftovers by the teachers and school staff. All interviews and FGDs were audio- and video-recorded and transcribed verbatim for analysis.

Research Instruments

The research instruments consisted of an interview and FGD guides. Both instruments underwent content validation by experts in public policy and nutrition using a structured academic review process. To minimize interpretive bias, the researchers applied reflexivity by maintaining reflective notes throughout the data collection and analysis. These memos documented the initial assumptions, participant responses, and interpretive considerations related to the study findings.

Data Analysis

Data were analyzed thematically in three stages: open coding, axial coding, and selective coding.

During open coding, the researchers identified keywords, meaningful phrases, and core meanings from the interview and FGD transcripts. Axial coding was then conducted by grouping conceptually related codes into policy implementation categories, including communication, resources, implementer disposition and bureaucratic structure. Selective coding was performed by integrating the main categories into overarching themes that explained the relationship between policy implementation, learning practices, and students' vegetable consumption behavior.

The analysis was conducted manually without qualitative data analysis software because the number of participants and the volume of data were considered manageable for in-depth analysis through repeated reading and direct interpretation by the researchers. The analytical process was guided by Edward III's policy implementation framework, which comprises four main variables: communication, resources, implementer disposition, and bureaucratic structure (Edwards III, 1980; Mubarak et al., 2020). The study themes were developed through the synthesis of the coding results and interpretation of the relationships among the implementation categories. To enhance analytical transparency, the researchers developed a thematic framework that mapped the relationships among the initial codes, categories, and main study themes.

Table 1. Thematic framework for the analysis of vegetable consumption education implementation

Data (Informant Quotation)	Code	Category	Main Theme
"The program exists, but the intervention has not been emphasized."	Implementation has not been operationalized	Policy communication is not yet specific	Communication
"Teachers do not yet have guidelines."	Limited teaching tools	School implementation capacity	Resources
"The school tries to monitor students' meals."	School commitment	Support from school implementers	Implementer disposition
"The school develops it independently."	Absence of standardized SOPs	Unclear implementation mechanism	Bureaucratic structure

Trustworthiness

Data trustworthiness was maintained through methodological and source triangulation, member checking with key informants, and interpretive discussions among the research team to minimize analytical subjectivity.

Theme validation was conducted by comparing the consistency of the findings across participants and assessing the alignment of the

interpretations with the policy implementation framework used in this study.

Ethical Considerations

This study was approved by the Ethics Committee of the Faculty of Medicine and Health, Universitas Muhammadiyah Jakarta (approval number 169/PE/KE/FKK-UMJ/X/2025). All the participants provided

written informed consent before participating in the study.

Data confidentiality was maintained by storing all recordings and transcripts on password-protected digital devices with restricted access, limited to the researchers.

Result and Discussion

Data collection in the field was supported by nutritionists. As presented in Table 2, this study involved seven key informants. In-depth interviews were conducted with the Head of the Elementary School Development Division at the Tasikmalaya City Education Office, while focus group discussions (FGDs) were carried out at the intervention school with the participation of the school principal, two homeroom teachers (IPAS and Indonesian Language), the Physical Education, Sports, and Health (PJOK) teacher,

the Islamic Religious Education (PAI) teacher, and the SPPG nutritionist. All informants were considered key stakeholders in establishing and implementing school policies related to integrating vegetable consumption education into the curriculum, as reinforced by the national G7KAIH program. The fourth habit of the program, promoting healthy and nutritious eating, is closely linked to reducing plate waste and increasing vegetable consumption.

The findings were analyzed using Edward III's policy implementation framework. Overall, the results indicate that policy communication has been formally conducted; however, limitations in technical guidelines and resources have resulted in the integration of vegetable consumption education into the curriculum being implicit and inconsistent. Consequently, implementation tends to be symbolic and has not yet produced sustained improvements in students' vegetable consumption behavior.

Table 2. Informant characteristics and data collection methods

Code	Occupation	Method
P1	Head of Elementary School Development Division	In-Depth Interview
P2	School Principal	Focus Group Discussion
P3	Homeroom Teacher 5A	Focus Group Discussion
P4	Homeroom Teacher 5B	Focus Group Discussion
P5	PJOK Teacher	Focus Group Discussion
P6	PAI Teacher	Focus Group Discussion
P7	SPPG Nutritionist	Focus Group Discussion

Policy Communication

The communication of the G7KAIH policy from the Ministry of Education to the Tasikmalaya City Education Office and subsequently to schools has been formally conducted through socialization and official assignment letters. The Head of the Elementary School Development Division explained that the policy was communicated simultaneously to all school principals and followed up with assignment letters for program implementation at the school level: "For G7KAIH, the Ministry of Education conducted simultaneous socialization to all school principals since February, the Head of Education issued assignment letters to disseminate the movement" (P1).

Despite this formal communication, at the school level, policy guidance remained general and did not specifically direct the integration of vegetable consumption education into the classroom. One informant noted that while the program had been administratively established,

learning interventions related to vegetable consumption had not been prioritized: "The program exists, but the intervention has not been emphasized" (P2).

Within schools, vegetable consumption content is typically incorporated into IPAS, PJOK, and PAI lessons without a structured instructional design. IPAS teachers identified opportunities for integration within the digestive system material, while PJOK teachers reported that nutrition topics could only be "slipped in" because of limited class time (P3; P5). Religious values in PAI were also viewed as potential entry points for vegetable consumption education (P6). However, the absence of focused instructional emphasis limited students' understanding of vegetables, as reflected in plate waste observations: "The broth and meatballs were finished... but the caisim was left uneaten... they understand vegetables as just the broth" (P4). These findings suggest that policy messages have not yet fully

translated into learning experiences that consistently shape students' understanding and vegetable consumption behavior. From a community nutrition perspective, this reflects low food literacy and limited exposure to the consumption of whole vegetables. Taste preference theory explains that children tend to select foods based on flavor and texture preferences rather than vegetables, which are often perceived as less appealing. Family food parenting practices also play a role in shaping children's perceptions and acceptance of vegetables through daily eating experiences (Silva et al., 2021).

A discrepancy was noted between the perceptions of the education office officials and school implementers. While the education office considered the program 'socialization adequate, schools perceived a lack of clear technical guidance. This gap highlights the divergence between administrative-level policy communication and school-level implementation practices. Edward III (1980) emphasizes that policy communication requires not only formal dissemination but also clear, consistent, and operational messaging to ensure uniform interpretation by implementers in the field (Bangham et al., 2023; Guuru & Adede, 2022). The absence of technical guidelines for integrating vegetable content, learning objectives, and student monitoring mechanisms resulted in a gap between national policy design and classroom practice. These findings also demonstrate the interrelation between policy communication, curriculum integration, and students' eating experiences in shaping vegetable consumption education in schools. Strengthening policy communication should focus on developing actionable operational guidelines, including the illustrative integration of vegetable content into lessons and simple monitoring based on leftover vegetables as feedback on program implementation. Although formal communication mechanisms exist, effective implementation also depends on the availability of resources that support the execution of school-level programs.

Resources

Resource limitations emerged as a major barrier to implementing vegetable consumption education in elementary schools in the present study. Informants reported that "budget constraints impede program implementation

and follow-up," and that teachers require teaching tools and training to deliver vegetable education more effectively (P1). Student acceptance of vegetable menus was also low, particularly for certain dishes, leaving substantial vegetable leftovers.

In response, schools adopted adaptive strategies involving parental engagement, student meal supervision, and the simple monitoring of leftover food. The school principal noted that students were asked to bring food containers, and parents were encouraged to oversee their child's food consumption at home. A simple monitoring system was implemented, categorizing leftovers as "finished," "partially eaten," and "uneaten" (P2). Nevertheless, field data indicate that students continue to select preferred components over vegetables. For example, regarding a meatball menu, "only the broth and meatballs were eaten, but the caisim was left uneaten, because they think vegetables are just the broth" (P4). These observations suggest that low vegetable consumption is influenced not only by availability, but also by taste preferences and established eating habits. School-aged children tend to favor familiar and preferred flavors, such as broth or meatballs, over vegetables with bitter tastes or undesirable textures. This aligns with the taste preference theory, which posits that repeated exposure, sensory experience, and early eating learning influence vegetable acceptance. Furthermore, the perception that "vegetables are broth" reflects an incomplete understanding of the forms and functions of vegetables in the diet.

Additionally, differences in the focus of program implementers were observed. The Education Office emphasized socialization and cross-sector collaboration: "The Education Office also conducts cross-sector collaboration through joint nutrition socialization with the Health Office and Poltekkes" (P1). However, schools face practical challenges regarding teacher capacity and student acceptance of vegetable menus. This disparity indicates that administrative-level policy implementation has not fully aligned with operational needs at the school level in the study area. From Edward III's perspective (1980), resources encompass not only budget availability but also implementer capacity, facility support, and the quality of the supporting policy resources. In this study, limited teacher capacity and low menu acceptance demonstrated that vegetable

consumption education implementation lacked sufficient resources to achieve consistent changes in students' eating behaviors. Successful school policy implementation depends not only on program existence but also on the school's ability to translate policy into learning experiences and healthy eating practices in the school environment.

This study also highlights the link between teacher capacity, menu quality, and student consumption behavior in determining program effectiveness. Resource limitations have prompted teachers to adapt their teaching and monitoring practices independently (Guuru & Adede, 2022). In the context of policy implementation, this indicates interpretive latitude among implementers due to the absence of specific guidelines. Previous studies have shown that ambiguous and underspecified policies can lead to variability in implementation across institutions according to organizational capacity (Chang & Brewer, 2022; Elken & Borlaug, 2024; Lotta et al., 2022; OECD, 2021). Therefore, strengthening implementation requires enhancing teacher capacity, providing simple teaching tools, and operational support to improve menu acceptance and reinforce the integration of vegetable education into classroom practice. In addition to resource availability, successful implementation is influenced by the implementers' attitudes and commitment.

Implementer Disposition

Implementer disposition in vegetable consumption education implementation exhibited variations in commitment and responses among school personnel. Education office informants emphasized the importance of integrating vegetable content into the school curriculum and linking it to the development of healthy eating habits: "Integration of vegetable content is important in the school curriculum," referencing personal parental experiences with challenges in children consuming vegetables (P1). At the school level, adaptive efforts included meal supervision, parental involvement, regulations on bringing food containers, and the development of menu variation to enhance student acceptance (P2, P7). Edward III (1980) emphasizes that implementer disposition includes acceptance, commitment, and readiness to execute policy.

In this study, positive teacher and school dispositions did not automatically translate into consistent vegetable consumption education implementation, as they were still constrained by structural and resource limitations. This underscores that successful school policy implementation depends not only on implementer support but also on clear implementation guidance and systemic support that allows the operational translation of policy into classroom practices (Idris & Nazara APM, 2024; Yudithia et al., 2024). Therefore, strengthening implementation should focus not only on enhancing implementer commitment but also on developing instructional strategies and institutional support that facilitate the internalization of vegetable consumption behaviors among elementary students. Nevertheless, positive implementer disposition alone is insufficient to ensure successful implementation in the absence of clear bureaucratic structures and operational mechanisms.

Bureaucratic Structure

The bureaucratic structure of G7KAIH implementation remains top-down, supported by formal documentation and socialization from the Education Office to schools. Informants indicated that program execution was driven by assignment letters and administrative directives from the education office to school principals: "Since February, the Head of Education issued assignment letters..." (P1). However, schools independently developed program implementation due to the absence of standardized technical guidelines and operational procedures. One informant noted, "There are guidelines... but the school develops them independently" (P1).

At the school level, the integration of vegetable consumption education into intra- and extracurricular activities lacked a clear definition. School informants stated, "The program exists, but the intervention has not been emphasized, and its placement in learning activities is unclear" (P2). Schools began simple monitoring using teachers' "small notes" (P2) and attempted to integrate vegetable consumption content into IPAS and PJOK lessons (P3–P5); however, these practices were not formalized into standardized instructional procedures.

These findings indicate a gap between formal policy structures and school-level implementation practices. While the education office considered the program operational through socialization and administrative instructions, schools still faced unclear role distribution, coordination mechanisms, and instructional standards issues. Thus, implementation relied heavily on school-level interpretation and initiative, resulting in variations across classes and schools. According to Edward III (1980), bureaucratic structures maintain implementation consistency through clear standard operating procedures (SOPs), task allocation, and policy coordination chains. In this study, the lack of specific operational guidelines led schools to adapt independently when integrating vegetable consumption education into their lessons. While school autonomy allows for flexibility, implementation quality may vary among schools without clear structural support. These findings suggest that policy implementation is influenced not only by formal instructions but also by organizational capacity, implementer interpretation, and institutional support at the implementation level (Chang & Brewer, 2022; Eboreime et al., 2017; Martin et al., 2025; Oliveira et al., 2021; Rossi et al., 2025; Widiastuti, 2025).

This study also highlights the interrelationship among bureaucratic structure, instructional practice, and students' vegetable consumption behavior. Unclear implementation mechanisms resulted in the inconsistent integration of vegetable consumption education into lessons and healthy eating habituation at school. Successful school policy implementation requires a strong alignment among policy communication, organizational structure, implementer capacity, and students' learning experiences within the school environment. Strengthening program implementation necessitates a minimum uniform operational structure, including SOPs for integrating vegetable content into the curriculum, designating responsible personnel for vegetable education at schools, and simple monitoring mechanisms based on students' consumption categories, enabling policy translation into more consistent learning practices. Such structures ensure that implementation extends beyond administrative levels to become tangible learning experiences and habituation of healthy eating at the elementary-school level.

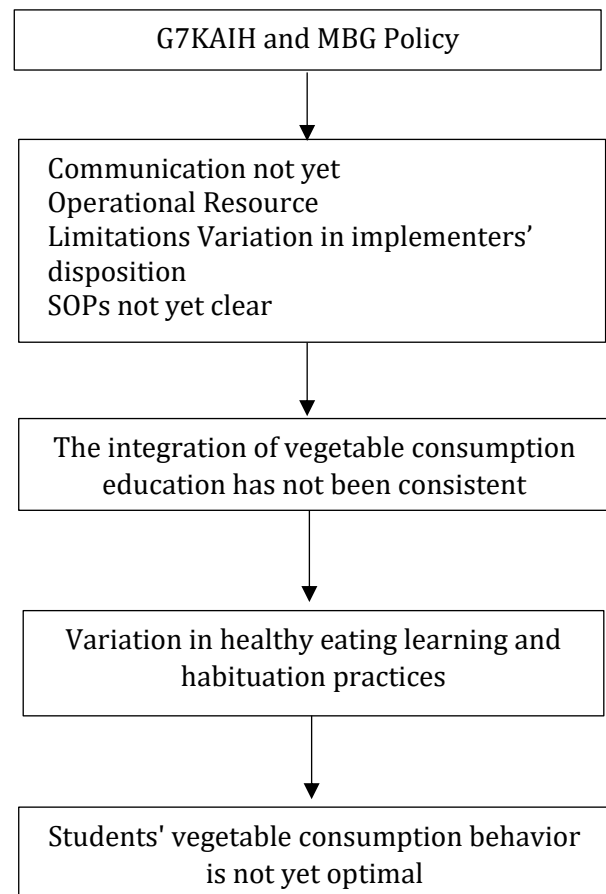


Figure 1. Conceptual model of vegetable consumption education implementation in elementary schools

Based on the synthesis of interviews, FGDs, and thematic analysis using Edward III's policy implementation framework, this study demonstrates that vegetable consumption education implementation in elementary schools is influenced by the interplay among policy communication, resource capacity, implementer disposition, and the school bureaucratic structure. These four factors collectively affect the consistency of integrating vegetable consumption education into lessons and healthy eating habits, ultimately impacting students' vegetable consumption behavior. The relationships among the study findings are summarized in the conceptual model (Figure 1).

The study is limited by its conduct at a single public elementary school; therefore, the generalization of the findings should be approached cautiously. Future research should involve schools with diverse characteristics and regional contexts to obtain a more comprehensive understanding of implementation.

Conclusion

The implementation of integrated vegetable consumption education within the elementary school curriculum through the G7KAIH program in Tasikmalaya City has been formally established but remains suboptimal at the classroom-practice level. Limitations in operational guidelines, teacher capacity, resource support, and monitoring mechanisms have resulted in predominantly administrative implementation of the program.

This study demonstrates that successful school-based policy implementation of vegetable consumption education depends not only on policy communication and structure but also on how the policy is translated into learning experiences and students' eating behaviors in the school environment. Plate waste can serve as a behavioral indicator of the quality of policy implementation in classroom practice. To enhance effectiveness, the standardization of curriculum integration guidelines, teacher capacity development, and strengthened formal collaboration among the Education Office, Health Office, and health education institutions are recommended to develop integrated SOPs for vegetable consumption education and plate waste-based monitoring in elementary schools.

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