

Stunting Policy Implementation in Indonesia: A Primary Health Care Perspective

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ABSTRACT

Introduction: Stunting remains a persistent public health challenge in Indonesia despite comprehensive national policies and multisectoral strategies. The primary issue lies not only in policy design but in its implementation at the primary health care level. This study aimed to examine how stunting policies are communicated, interpreted, and implemented, and to identify factors influencing implementation effectiveness within primary health care settings.

Research Methodology: A qualitative, theory-informed design was employed using Edwards III's policy implementation framework. Data were collected through semi-structured in-depth interviews with 25 purposively selected health workers, including nurses, midwives, nutritionists, and public health officers. Additional data sources included document reviews and observational notes. Thematic analysis was conducted to explore patterns related to communication, resources, implementer disposition, and bureaucratic structure.

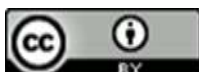
Results: Findings indicate that policy communication is predominantly top-down, with variable clarity and limited feedback mechanisms. Interpretation of policies is highly context-dependent, shaped by workload and local conditions. Implementation is largely integrated into routine maternal and child health services, with limited emphasis on preventive and multisectoral approaches. Key barriers include human resource constraints, insufficient funding, and rigid bureaucratic procedures. Despite these challenges, strong professional commitment among health workers emerged as a critical enabling factor supporting policy execution.

Conclusion: The effectiveness of stunting policy implementation depends on strengthening communication clarity, resource allocation, and intersectoral coordination. Enhancing frontline engagement and reducing bureaucratic rigidity are essential to align policy intent with practice. A process-oriented approach to implementation improvement is necessary to achieve sustainable reductions in stunting.

Keywords: Child Health Services; Communication; Growth Disorders; Health Policy; Primary Health Care.



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INTRODUCTION

Stunting remains a persistent quality problem within child health and nutrition services in many low- and middle-income countries, including Indonesia (Arief et al., 2025). Despite sustained national commitment, comprehensive policy frameworks, and multisectoral strategies, the prevalence of stunting has declined unevenly, with substantial variation across regions and communities (Arqam et al., 2026). This situation indicates that the core challenge is not limited to policy formulation or scientific knowledge about nutrition, but rather relates to the quality and effectiveness of policy implementation at the frontline of service delivery (Asefa et al., 2024). In particular, gaps between policy intent and everyday practice within primary health care systems continue to undermine optimal outcomes for children during the critical early stages of life (Suprpto et al., 2025).

The quality problem in stunting prevention is closely linked to how health policies are translated into routine services. National stunting strategies in Indonesia emphasize early detection, preventive nutrition interventions, maternal and child health services, and coordinated action across sectors such as health, education, sanitation, and social protection (Askari et al., 2026). However, at the operational level, these strategies are often implemented in fragmented and procedural ways. Frontline health workers frequently prioritize administrative compliance, reporting, and routine clinical tasks, while preventive, promotive, and community-based actions receive limited attention (Astuti et al., 2025). As a result, the quality of stunting prevention services is often defined by coverage and outputs rather than by continuity of care, responsiveness to local needs, and integration across sectors (Aswi et al., 2025).

Indonesia provides a particularly relevant context for examining this quality problem, given its decentralized health system (Ataullahjan et al., 2025). While decentralization aims to enhance responsiveness and local innovation, it also creates variability in institutional capacity, resource allocation, and governance arrangements across districts (Behrman & Vazquez, 2025). Primary health care facilities, especially community health centers, operate as the main interface between national policy and household-level behavior (Bhutta et al., 2025). These facilities are responsible for delivering a wide range of stunting-related services, including antenatal and postnatal care, growth monitoring, nutrition counseling, supplementation, and community outreach (Busey et al., 2024). In practice, however, primary health care providers work within complex organizational environments characterized by limited staffing, competing program priorities, and rigid bureaucratic procedures (Caraka et al., 2025). These conditions shape how stunting policies are interpreted, adapted, and implemented in daily work (Chakma et al., 2024).

Within this context, the quality of stunting policy implementation is influenced not only by resource availability but also by communication processes, professional discretion, and organizational culture (Deshpande & Ramachandran, 2025). Policy directives are typically communicated through formal, top-down mechanisms such as regulations, technical guidelines, and coordination meetings (Garina et al., 2024). While these mechanisms ensure policy dissemination, they do not always guarantee shared understanding or consistent interpretation at the frontline level (Gusweni et al., 2025). Health workers often receive policy updates without sufficient explanation or opportunity for feedback, leading to uncertainty and varied interpretations. Consequently, implementation practices differ across facilities, even when guided by the same national policy framework (Hamzah et al., 2025).

Recognizing these challenges, the present initiative focuses on strengthening the quality of stunting policy implementation within primary health care by addressing the processes through which policies are enacted, rather than solely emphasizing outcomes (Jalloh et al., 2025). The

intervention is grounded in the assumption that improving implementation quality requires systematic attention to how policies are communicated, how resources are mobilized, how frontline workers perceive and enact their roles, and how organizational structures support or constrain coordinated action (Koomson et al., 2024). Rather than introducing new technical interventions, this initiative emphasizes improving the functioning of existing systems and practices (Kelly et al., 2025).

The intervention is conceptualized as a policy-informed quality improvement initiative that enhances alignment between policy intent and frontline practice. It operates through four interrelated mechanisms (Lara-Arevalo et al., 2025). First, it seeks to improve the clarity and consistency of policy communication by encouraging structured dialogue, shared interpretation, and practical guidance for frontline providers (Lawes et al., 2025). Clear communication is expected to reduce ambiguity, support consistent prioritization of preventive actions, and strengthen accountability for quality implementation. Second, the initiative emphasizes optimizing the use of available resources by identifying gaps in human capacity, logistics, and data systems, and by promoting more efficient task allocation within primary health care teams. While resource constraints cannot be fully eliminated, better organization and prioritization are expected to improve service quality (Mchau et al., 2024).

The initiative emphasizes frontline health workers as active policy actors by strengthening motivation, ownership, and professional engagement through supportive leadership, reflective practice, and recognition mechanisms. It also addresses bureaucratic and coordination challenges by clarifying roles, streamlining procedures, and enhancing intersectoral collaboration. Implemented through iterative cycles of assessment, reflection, and adaptation, the approach promotes context-sensitive solutions embedded in routine primary health care practice. The initiative aims to improve implementation quality, align policy intent with service delivery, and enhance preventive focus. Ultimately, it supports sustainable and equitable reductions in stunting by optimizing systems, processes, and frontline capacity.

RESEARCH METHODOLOGY

The quality improvement intervention was designed to strengthen the implementation quality of stunting prevention policies within primary health care by improving the operationalization of existing policies and programs at the frontline level. Rather than introducing new clinical or nutritional interventions, the initiative focused on optimizing implementation processes through structured reflection, enhanced communication, and system-level support. The intervention targeted key implementation gaps in policy communication, resource utilization, frontline engagement, and intersectoral coordination, widely recognized as determinants of service quality in decentralized health systems.

The initiative adopted a qualitative, theory-informed quality improvement design, guided by a policy implementation framework that emphasizes communication, resources, implementer disposition, and bureaucratic structure. This design allowed for an in-depth examination of implementation processes while supporting iterative learning and adaptation within routine primary health care services. The intervention was implemented over a defined period through a series of facilitated activities, including structured discussions with health workers, review of existing service workflows, and reflection on barriers and enabling factors affecting stunting prevention practices. These activities were embedded within regular primary health care operations to ensure feasibility and sustainability.

Data collection used multiple qualitative methods to capture changes in implementation processes and perceived service quality. Semi-structured in-depth interviews were the primary data collection method and were conducted with frontline health care providers and health managers before and during the implementation period. Interviews explored experiences of policy communication, interpretation, service delivery practices, coordination mechanisms, and perceived changes resulting from the initiative. In addition, document reviews of local guidelines, service reports, and routine monitoring records were undertaken to contextualize interview findings and assess alignment between policy directives and practice. Observational notes from meetings and routine service activities were also used to enrich the analysis and support triangulation.

The sample was purposively selected to ensure representation of key professional roles involved in stunting prevention. Participants included nurses, midwives, nutritionists, and public health officers working in primary health care facilities, as well as selected managers at district health offices. Sample size was determined based on qualitative research principles, with an initial target of approximately 20–30 participants to capture diverse perspectives across roles and settings. Recruitment continued until thematic saturation was reached, defined as the point at which no new substantive insights emerged from successive interviews. This approach ensured adequate depth and credibility rather than statistical representativeness, which is appropriate for quality improvement evaluation focused on processes and mechanisms.

The intervention was implemented in primary health care settings, specifically community health centers operating at the district and sub-district levels. These facilities were selected because they represent the frontline of stunting policy implementation and are responsible for delivering maternal and child health services, nutrition counseling, growth monitoring, and community outreach. The decentralized governance context meant that facilities operated under varying resource and organizational conditions, providing a realistic setting for examining implementation quality. The initiative engaged multiple stakeholders within this setting. Healthcare providers were the primary participants and agents of change, as they were directly responsible for implementing stunting-related services. Health managers and policymakers at the district level were involved to support alignment with local regulations, facilitate coordination, and address structural constraints. While patients and community members were not directly involved as study participants, the intervention indirectly aimed to improve service quality and continuity, which affects mothers, caregivers, and children receiving care.

The main outcomes and key performance indicators used to evaluate impact focused on implementation quality rather than clinical endpoints. Key indicators included improvements in perceived clarity and consistency of policy communication, enhanced alignment between national guidelines and local practice, increased emphasis on preventive and promotive stunting-related activities within routine services, and strengthened coordination among health and non-health sectors. Additional indicators included frontline health workers' reported confidence, motivation, and sense of ownership in implementing stunting prevention activities, as well as perceived reductions in administrative burden and workflow inefficiencies. These indicators were assessed qualitatively through thematic analysis of interview data and, where available, supported by documentary evidence.

Table 1. Interview Guide: Themes and Essential Questions

Theme	Focus Area	Essential Questions
Policy Communication	Transmission and clarity of the stunting policy	How are stunting policies communicated from the national and district levels to primary health care facilities? How clear and consistent are the policy guidelines that health workers receive?
Policy Interpretation	Understanding and adaptation at the frontline level	How do primary health care providers interpret stunting policy guidelines in their daily work? What adjustments are made to align policies with local contexts?
Policy Implementation	Execution within primary health care services	How are stunting policies implemented through routine maternal and child health services? What activities are prioritized in stunting prevention and control?
Resources	Human, financial, and logistical capacity	What resources are available to support the implementation of the stunting policy at the primary health care level? What resource constraints affect implementation effectiveness?
Implementer Disposition	Attitudes, commitment, and motivation	How do health workers perceive their role in implementing stunting policies? What factors influence their motivation and commitment?
Bureaucratic Structure	Organizational procedures and coordination	How do organizational structures and SOPs influence stunting policy implementation? How is coordination conducted across sectors involved in stunting reduction?

RESULT

Analysis of the interview data revealed several interrelated themes describing how stunting policies are communicated, interpreted, and implemented within primary health care settings, as well as the institutional, organizational, and human factors that influence implementation effectiveness. The findings are presented in accordance with the two research questions.

Communication, Interpretation, and Implementation of Stunting Policies

Participants reported that stunting policies are primarily communicated through formal channels, including ministerial regulations, technical guidelines, circular letters, and coordination meetings at district and facility levels. However, the clarity and consistency of policy communication varied across settings. Several participants noted that policy directives were often delivered in a top-down manner, with limited opportunities for clarification or feedback at the primary health care level. As one nurse explained:

“We receive the guidelines during meetings or through official letters, but sometimes the instructions are not very detailed, so we rely on our own understanding.”

This uneven communication affected how policies were interpreted and prioritized in daily practice.

Interpretation Depends on Local Context and Professional Judgment

Participants emphasized that local conditions, workload, and professional background strongly influenced interpretations of stunting policies. Health workers often adapted policy

guidelines to fit local realities, such as limited staff, high patient volumes, or community characteristics.

A midwife stated:

“The policy is clear at the national level, but in practice, we have to adjust it to what is possible in the field.”

This adaptive interpretation enabled service continuity but also led to variations in implementation across facilities.

Implementation Focuses on Routine Services Rather Than Integrated Action

Most participants described stunting policy implementation as embedded in routine maternal and child health services, including growth monitoring, antenatal care, nutrition counseling, and supplementary feeding programs. However, integrated and preventive approaches were often constrained.

A nutritionist noted:

“We mostly focus on weighing and counseling, but broader prevention activities require coordination with other sectors, which is not always easy.”

As a result, implementation tended to be service-oriented rather than fully multisectoral.

Factors Influencing the Effectiveness of Policy Implementation

Limited human resources, time constraints, and insufficient funding were consistently identified as key barriers to effective implementation. Participants reported that stunting programs often had to compete with other priority health programs.

A public health officer explained:

“One staff member handles several programs, so stunting cannot always receive full attention.”

Inadequate data systems and logistical support also hindered monitoring and follow-up activities.

Bureaucratic Structure and Coordination Challenges

Participants highlighted challenges related to bureaucratic procedures and intersectoral coordination. While multisectoral collaboration is mandated by policy, coordination mechanisms were often unclear or weakly institutionalized.

A participant stated:

“Coordination meetings exist, but responsibilities between sectors are not always clearly defined.”

These structural issues limited the effectiveness of integrated stunting interventions at the community level.

Implementer Disposition and Commitment as Key Enablers

Despite structural constraints, participants expressed strong personal commitment to stunting prevention. Professional motivation, sense of responsibility, and prior training influenced the extent to which health workers implemented policies.

A nurse remarked:

“Even with limitations, we try to do our best because stunting affects the future of children.”

Facilities with motivated staff and supportive leadership were perceived as more successful in implementing stunting-related activities. Overall, the findings indicate that stunting policies in Indonesia are communicated through formal mechanisms but are interpreted and implemented flexibly within primary health care settings. A complex interaction of institutional resources, organizational structures, and human factors shapes the effectiveness of

implementation. While frontline health workers demonstrate strong commitment, limitations in communication clarity, resources, and intersectoral coordination continue to constrain the full realization of stunting policy objectives.

Table 2. Summary of Themes, Subthemes, and Illustrative Quotes

Theme	Subtheme	Illustrative Quotes
Policy Communication	Formal top-down communication	“We usually receive the stunting policy through official letters and coordination meetings from the district health office.”
	Lack of clarity and consistency	“Sometimes the guidelines change, but the explanation is not detailed, so we are unsure which version to follow.”
Policy Interpretation	Context-based interpretation	“The policy is clear nationally, but we have to adjust it to the situation in our area.”
	Professional discretion	“Each profession focuses on different parts of the policy based on our roles.”
Policy Implementation	Integration into routine services	“Stunting prevention is mostly implemented through routine services like growth monitoring and counseling.”
Resources	Limited preventive focus	“We do the weighing and reporting regularly, but preventive activities need more time and staff.”
	Human resource constraints	“One staff member handles several programs, including stunting.”
	Limited financial and logistical support	“Funding exists, but it is not always sufficient for outreach and follow-up activities.”
Implementer Disposition	Professional commitment	“We feel responsible because stunting affects children’s future.”
	Fatigue and workload pressure	“The workload is heavy; sometimes it affects our motivation.”
Bureaucratic Structure	Rigid administrative procedures	“Reporting requirements take a lot of time that could be used for field activities.”
	Weak intersectoral coordination	“Coordination meetings are held, but roles between sectors are not clearly defined.”

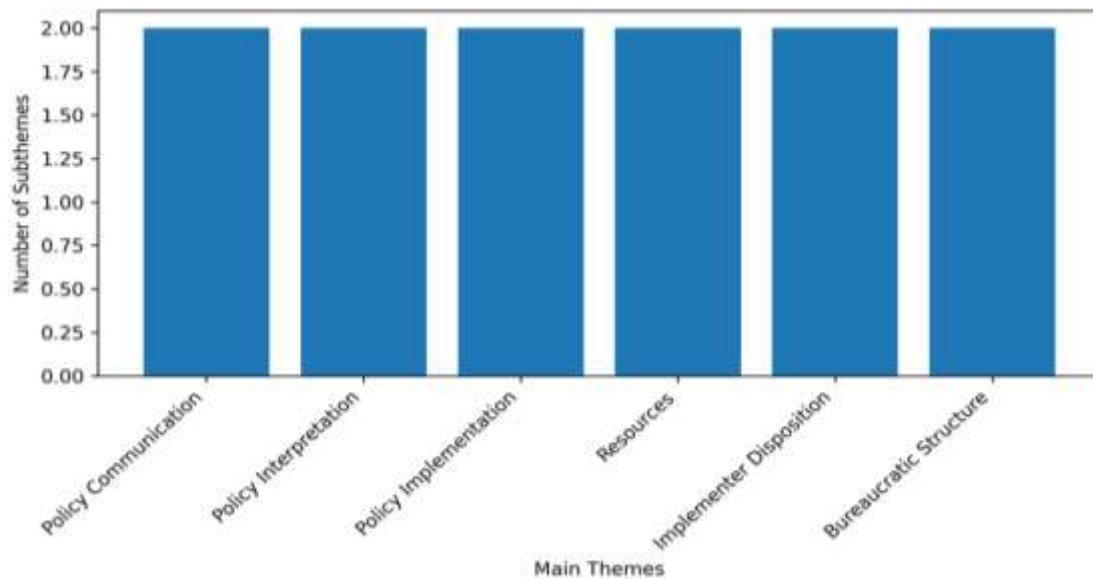


Figure 1. Distribution of Subthemes Across Main Themes

The bar chart illustrates the distribution of subthemes across six main themes related to stunting policy implementation. Each theme comprises two subthemes, indicating a balanced analytical emphasis across policy communication, policy interpretation, policy implementation, resource availability, implementer disposition, and bureaucratic structure. This distribution suggests that challenges in policy implementation are multidimensional and systemic rather than concentrated within a single domain. The thematic distribution demonstrates that barriers and enabling factors in stunting policy implementation are evenly spread across organizational, professional, and structural dimensions. This finding highlights the need for integrated policy interventions that simultaneously address communication mechanisms, frontline discretion, resource constraints, and bureaucratic processes.

DISCUSSION

This study examined the implementation of stunting policies in Indonesia from a primary health care perspective, focusing on how policies are communicated, interpreted, and enacted at the frontline level, as well as the institutional, organizational, and human factors that shape implementation effectiveness. The findings reveal that while Indonesia has established a strong policy framework for stunting reduction, the success of these policies largely depends on implementation dynamics within primary health care settings.

Consistent with policy implementation theory, the results demonstrate that implementation is not a linear process but a complex interaction between policy design, organizational structures, and human agency. Using Edwards III's framework, this discussion interprets the findings across four key dimensions: communication, resources, implementer disposition, and bureaucratic structure.

Policy Communication and Interpretation

The findings indicate that stunting policies are primarily communicated through formal, top-down mechanisms such as official letters, technical guidelines, and coordination meetings. While these channels ensure policy transmission, variations in clarity and consistency affect how policies are understood at the primary health care level. Frequent policy updates without adequate explanation contribute to uncertainty among frontline health workers, echoing previous studies

that emphasize the importance of clear, consistent communication in policy implementation (Mgomezulu et al., 2025).

Reliance on formal communication alone may be insufficient in complex health systems, where frontline providers face diverse contextual challenges. Effective policy communication requires not only dissemination but also interactive processes that allow clarification, feedback, and shared understanding (Nduwayezu et al., 2025). The absence of such mechanisms may partially explain the variability in policy interpretation observed across primary health care facilities. Interpretation of stunting policies was found to be highly context-dependent. Health workers adapted national guidelines to local realities, drawing on professional judgment and experience (Otoo et al., 2025). While this adaptive approach reflects the flexibility inherent in primary health care, it also introduces variability in implementation practices (Oyenubi & Rossouw, 2024). Similar findings have been reported in decentralized health systems, where frontline discretion plays a significant role in shaping policy outcomes. This underscores the need for policy frameworks that balance standardization with contextual adaptability (Prayitno et al., 2025).

Policy Implementation in Primary Health Care

The study found that stunting policy implementation is largely embedded within routine maternal and child health services, such as growth monitoring, nutrition counseling, and antenatal care. This integration aligns with the principles of primary health care, which emphasize continuity, accessibility, and preventive care (Yet et al., 2024). However, participants reported that implementation often prioritizes routine activities and reporting requirements over comprehensive preventive and promotive interventions (Rahardianto et al., 2024). The emphasis on programmatic compliance rather than integrated prevention suggests that implementation may be driven more by administrative accountability than by holistic child development goals (Rahut et al., 2024). Preventive activities, including intensive counseling, home visits, and community engagement, were constrained by time limitations and competing program demands. This finding is consistent with previous research highlighting the tension between service delivery and prevention in resource-constrained primary health care settings (Richi & Alam, 2025).

Moreover, limited integration across health and non-health sectors further constrained implementation. Although multisectoral collaboration is a central component of Indonesia's stunting reduction strategy, coordination at the local level remains weak. This gap between policy intent and operational reality highlights the challenges of translating multisectoral policies into practice within existing bureaucratic structures.

Resource Constraints and Institutional Capacity

Resource availability emerged as a dominant factor influencing implementation effectiveness. Participants consistently reported shortages in human resources, funding, and logistical support. Health workers frequently managed multiple programs simultaneously, limiting their capacity to focus on stunting prevention. These findings align with earlier studies demonstrating that inadequate resources undermine even well-designed health policies (Rosyada et al., 2025).

Financial constraints further limited outreach, monitoring, and follow-up activities, particularly in hard-to-reach communities. Although funding for stunting programs exists, its allocation is often rigid, reducing flexibility to address local priorities (Saputra et al., 2025). In addition, weaknesses in data systems and infrastructure hindered effective monitoring and

evaluation, limiting primary health care providers' ability to identify and respond to at-risk children in a timely manner (Seferidi et al., 2025).

These findings underscore that policy effectiveness is contingent on institutional capacity. Without adequate resources and supportive systems, primary health care providers are unable to fully operationalize policy objectives, regardless of their commitment or competence (Sentika et al., 2024).

Implementer Disposition and Human Factors

Despite structural and resource constraints, frontline health workers demonstrated strong professional commitment to stunting prevention. Participants expressed a sense of responsibility to improve child health outcomes and recognised the long-term consequences of stunting. This intrinsic motivation served as a critical enabling factor, sustaining implementation efforts under challenging conditions (Soofi et al., 2024).

However, high workloads and administrative burdens contributed to fatigue and reduced morale among some participants. Over time, such pressures may erode motivation and compromise service quality (Sharma et al., 2025). The findings suggest that implementer disposition is shaped not only by individual attitudes but also by organizational environments (Wanka et al., 2025). Supportive leadership, training opportunities, and recognition of staff efforts were identified as factors that enhanced motivation and commitment (Supranoto et al., 2025).

These results reinforce the importance of viewing frontline health workers as active policy actors rather than passive implementers. Their perceptions, motivations, and coping strategies significantly influence how policies are enacted in practice.

Bureaucratic Structure and Intersectoral Coordination

Bureaucratic structures played a dual role in stunting policy implementation. On one hand, standard operating procedures and reporting systems provided administrative guidance and accountability. On the other hand, rigid procedures and extensive reporting requirements consumed valuable time and limited flexibility for field-based activities.

Intersectoral coordination, although formally mandated, was often weakly institutionalized. Participants described coordination mechanisms as fragmented and focused primarily on reporting rather than collaborative problem-solving (Wand et al., 2024). Unclear roles and overlapping responsibilities across sectors further impeded integrated action. These findings reflect broader challenges in multisectoral governance, particularly in decentralized systems where authority and accountability are distributed across multiple actors (Suprpto et al., 2024). Strengthening bureaucratic structures to support coordination, rather than merely compliance, may enhance the effectiveness of stunting policies. Clear role definitions, shared performance indicators, and regular joint planning could improve multisectoral collaboration at the primary health care level (Tabunga et al., 2025).

Implications for Policy and Practice

Collectively, the findings suggest that improving stunting policy outcomes in Indonesia requires attention to implementation processes within primary health care systems. Enhancing communication clarity, strengthening resource allocation, supporting frontline workers, and improving bureaucratic coordination are critical areas for intervention (Tonelli et al., 2025). Policies should incorporate mechanisms for feedback and learning, allowing adaptation based on frontline experiences (Taofik et al., 2026).

From a theoretical perspective, this study reinforces the relevance of Edwards III's policy implementation framework in analyzing complex public health policies. The findings illustrate how communication, resources, disposition, and bureaucratic structure interact dynamically to

shape implementation outcomes. Integrating this framework into stunting policy analysis provides a more nuanced understanding of implementation challenges and opportunities (Tawde et al., 2025).

Study Limitations

While this study provides valuable insights, it has limitations. The qualitative design limits generalizability, and findings reflect the perspectives of selected primary health care providers. Future research could incorporate perspectives from policymakers, community members, and non-health sectors to provide a more comprehensive understanding of stunting policy implementation. This study highlights that the effectiveness of stunting policies in Indonesia is determined not only by policy design but by how policies are communicated, interpreted, and implemented within primary health care settings. Addressing institutional, organizational, and human factors is essential for translating policy commitments into meaningful improvements in child nutrition and development outcomes.

CONCLUSION

This study demonstrates that complex interactions between communication processes, resource availability, implementer disposition, and bureaucratic structures shape the implementation of stunting policies in Indonesian primary health care. While policies are formally disseminated through top-down mechanisms, variations in clarity and limited feedback channels result in diverse interpretations and inconsistent implementation across settings. Frontline health workers adapt policies to local contexts, ensuring service continuity but also contributing to variability in practice. Implementation remains largely embedded in routine maternal and child health services, with insufficient emphasis on preventive and multisectoral approaches. The findings directly address the study objective by confirming that systemic constraints, including limited human resources, inadequate funding, and rigid administrative procedures, primarily drive gaps between policy intent and practice. At the same time, strong professional commitment among health workers is a key enabling factor for policy implementation.

Policy and practice should therefore prioritize improving communication clarity, strengthening resource allocation, and enhancing intersectoral coordination. Interventions that support frontline engagement, reduce administrative burden, and institutionalize collaborative governance mechanisms are essential. A process-oriented approach to implementation improvement is recommended to ensure sustainable, equitable, and effective stunting reduction in decentralized health systems.

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board of Politeknik Sandi Karsa (Approval No. B-382/PT19/IX/2025). All participants provided informed consent before data collection. Confidentiality and anonymity were maintained throughout the study, and participants had the right to withdraw at any time without consequences.

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Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

Authors' Contributions

Suprpto conceptualized the study, developed the research design, and led its overall implementation. He conducted data collection, analyzed the data, and interpreted the findings. Suprpto also drafted the initial manuscript, critically revised the content for intellectual quality, and approved the final version for publication. He is accountable for all aspects of the work and ensures the integrity and accuracy of the study.

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