

Health Education Management Strategies to Achieve Stunting Reduction Targets in Minahasa Regency

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ABSTRACT

This article analyzes health education management strategies for accelerating the reduction of stunting in Minahasa Regency. The study is positioned within educational management because stunting reduction is not only a biomedical intervention but also a managed learning process that requires planning, role distribution, community education, inter-sector coordination, monitoring, and sustainability. A qualitative design was used through in-depth interviews, focus group discussions, and document review involving health workers, posyandu cadres, and affected community members. The findings show that health services for stunting reduction have been implemented through primary health care channels such as puskesmas, posyandu, and referral services. The services include antenatal care, iron supplementation, supplementary feeding, immunization, growth monitoring, nutrition education, and follow-up for children with nutritional problems. However, the target has not been fully achieved because stunting remains a multidimensional problem shaped by socioeconomic conditions, cultural practices, incomplete behavior change, limited human resources, fragmented data, and weak cross-sector integration. The article proposes an integrated health education management model consisting of Division of Work, Promotive Education, Preventive Action, Life-Cycle Approach, Community-Based Action, Integrated Services, and Sustainability. The model contributes to educational management by framing stunting reduction as a coordinated system of learning, behavior change, and public health governance.

Keywords: community-based education, health education management, integrated services, Minahasa, promotive preventive strategy, stunting.

INTRODUCTION

Stunting is a chronic growth failure condition that occurs when children experience inadequate nutrition and repeated infections, especially during the first one thousand days of life. It is commonly measured through height-for-age standards, but its meaning extends beyond physical stature. Stunting reflects long-term deprivation in nutrition, care, health services, sanitation, and social protection. For this reason, it has become a strategic indicator of human development, public health performance, and social equity. In the Indonesian context, stunting reduction has been placed as a national priority, yet the persistence of target gaps at provincial and district levels indicates that the problem cannot be solved only through medical services or food distribution. It requires a comprehensive management approach that connects health education, community behavior, institutional coordination, and evidence-based monitoring.

The national trend demonstrates that policy commitment has produced progress, but the pace of reduction has not always aligned with the expected targets. The prevalence of stunting declined from 30.8 percent in 2018 to around 21.6 percent in 2022 and 21.5 percent in 2023, yet the 2024 target of 14 percent remained difficult to reach. Such a pattern suggests that policy availability does not automatically produce policy effectiveness. Programs may be formally designed, but results depend on how well local systems translate policy into service delivery, family education, inter-sector action, and continuous follow-up. This is where educational management becomes relevant: public health messages must be converted into learning experiences that families can understand, remember, and practice.

In Minahasa Regency, the urgency is reinforced by local data and program realities. The prevalence of stunting increased from 16.5 percent in 2022 to 23.1 percent in 2023, before later showing improvement in local program records. This fluctuation indicates that the problem is not simply about the presence or absence of interventions, but about the consistency, quality, integration, and monitoring of those interventions. A district may have health centers, posyandu services, cadres, antenatal care, supplementary feeding, and policy instruments, yet the target may remain unreached if education does not change household behavior, if data systems are fragmented, if cadres are not consistently trained, or if local actors work without clear role distribution. See figure 1.

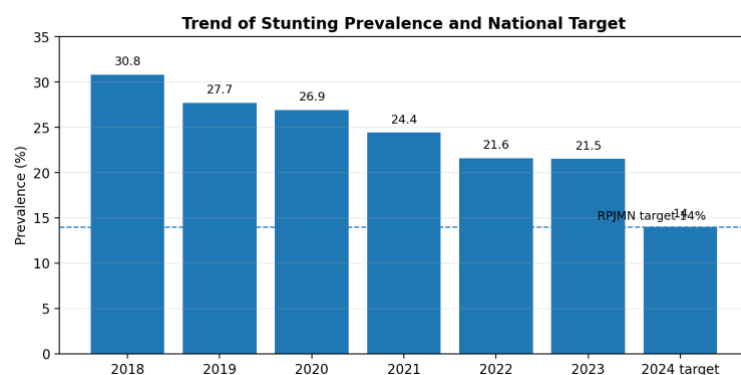


Figure 1. Trend of stunting prevalence and national target

The starting point of this article is the assumption that stunting reduction is a managed educational process. Families must learn about pregnancy nutrition, exclusive breastfeeding, complementary feeding, child growth monitoring, hygiene, immunization, and care-seeking behavior. Cadres must learn how to communicate risk, measure children accurately, use data, and guide families. Health workers must manage education as a professional function, not as a side activity. Local government must ensure that health education is connected with sanitation, social

welfare, food security, family planning, and village governance. These linkages make the issue suitable for analysis through educational management theory and public health management practice.

The article therefore aims to transform empirical findings on health services, causal factors, policy implementation, and strategy formulation into a journal article that can be used for academic publication. The article does not treat stunting only as a nutritional deficiency. It interprets it as a multidimensional public problem that requires health education management strategies based on clear division of work, promotive and preventive orientation, life-cycle services, community participation, integrated service delivery, and sustainability. The discussion is organized in the style of an academic journal, with theory, method, findings, discussion, model visualization, and practical implications.

LITERATURE REVIEW

Educational management provides an important theoretical lens for examining stunting reduction because health education is a structured effort to change knowledge, attitudes, and behavior. In classical management theory, organizational effectiveness depends on planning, organizing, implementation, coordination, and control. In education, these functions are translated into needs assessment, learning design, resource organization, instructional delivery, monitoring, and evaluation. In community health education, the learner is not only a student in a classroom; the learner may be a pregnant woman, a young mother, a family member, a village cadre, or a community leader. Therefore, education management must be flexible, contextual, and oriented toward behavior change.

Contemporary educational management emphasizes that program success is influenced by leadership commitment, organizational culture, stakeholder involvement, and the capacity of managers to maintain an effective learning environment. Umbase and Wua (2020) argue that child-friendly organizational culture is important in shaping a supportive educational environment. This idea is relevant to stunting reduction because family and community environments must be made supportive for child growth. Umbase et al. (2023) further show that classroom management skills involve the ability to create, maintain, and restore optimal learning conditions; in health education, similar management ability is needed to organize counseling, posyandu learning sessions, and home-based mentoring. Umbase et al. (2024) also highlight that limited managerial knowledge and implementation capacity can become barriers in child protection management, a lesson that is applicable to stunting programs that depend heavily on frontline actors and community-based coordination.

Human resource competence is another key dimension. Kambey, Evinita, and Kewo (2022) emphasize that organizational performance is shaped by competence and independence, while Kambey et al. (2024) underline that job characteristics, individual characteristics, and work motivation contribute to employee performance. These arguments support the view that stunting reduction requires trained and motivated health workers and cadres. A program that depends on growth monitoring, family education, data reporting, and follow-up cannot be effective if local implementers lack technical skills, communication capacity, or motivation. In health education management, competence is not limited to clinical knowledge; it also includes communication skills, cultural sensitivity, problem-solving, and documentation.

Katuuk and Kowal (2024) demonstrate that learning outcomes depend on carefully designed educational instruments and measurable competencies. Katuuk and Tarusu (2024) show that project-based technology-supported learning can improve understanding when methods match

learner needs. Katuuk et al. (2025) emphasize the role of policy and politics in educational programs, including the importance of governance, stakeholder integration, and institutional support. In the context of stunting, these ideas point to the need for education that is not merely informational but strategically designed. Families should receive messages using appropriate media, cadres should be trained through practical learning, and district policies should integrate health education with other sectors.

Health education management is also rooted in public health theory. Health education seeks to strengthen health literacy, which is the ability of people to access, understand, evaluate, and use information for health decisions. Nutbeam and Muscat (2021) describe health literacy as a multidimensional resource for health promotion, while WHO and UNICEF frameworks emphasize primary health care as a foundation for equitable health improvement. Stunting reduction requires health literacy at multiple levels: mothers must understand feeding and care practices; fathers and family members must support household decisions; cadres must interpret growth monitoring results; and program managers must use data for targeted intervention.

The life-cycle approach is essential because stunting is shaped by risks before birth, during pregnancy, infancy, toddlerhood, and adolescence. Health education must therefore begin with adolescent girls, continue through premarital and pregnancy education, support breastfeeding and complementary feeding, and maintain growth monitoring during early childhood. A purely curative approach is inadequate because the most critical causes of stunting are often formed long before a child is diagnosed. Preventive and promotive education must operate across the life cycle so that risks are reduced before growth failure becomes visible.

Policy implementation theory also informs the analysis. A policy may be well formulated, but the outcome depends on implementation capacity, resources, communication, bureaucratic structure, and the responsiveness of target groups. The concept of policy-implementation gap is highly relevant to stunting reduction. Local governments may adopt national regulations and prepare action plans, but if cross-sector roles are unclear, if monitoring systems are fragmented, or if community participation is weak, the policy may not produce the intended reduction. Therefore, the effectiveness of stunting policy must be evaluated not only by the existence of regulations but also by the quality of execution.

Community-based education is particularly important because stunting reduction occurs in daily household practices. Posyandu cadres, village actors, and community leaders are close to families and can translate formal messages into local language and practical routines. Community-based education helps overcome cultural barriers, builds trust, and enables repeated reinforcement. When communities become active partners rather than passive recipients, health education becomes more sustainable. The challenge is to manage community participation so that it is coordinated, evidence-based, and connected with professional health services. See table 1.

Table 1. Theoretical Foundations Used in the Article

Theory / Source	Core idea	Relevance to stunting health education management
Educational management (Fayol; Suyudi & Prasetyo, 2023)	Planning, organizing, implementation, coordination, and evaluation	Provides the management cycle for designing and monitoring health education programs.
Umbase & Wua (2020); Umbase et al. (2023, 2024)	Learning environments, organizational culture, and managerial capability	Supports the need for supportive community learning and stronger implementer capacity.
Kambey et al. (2022, 2024)	Competence, independence, motivation, and performance	Explains why trained and motivated health workers and cadres are critical.

Katuuk & Kowal (2024); Katuuk & Tarusu (2024); Katuuk et al. (2025)	Educational instruments, technology-supported learning, and policy governance	Supports structured, method-sensitive, and policy-integrated health education.
Health literacy and primary health care (Nutbeam & Muscat, 2021; WHO & UNICEF, 2020)	People need to understand and use health information in daily decisions	Frames stunting education as a literacy-building process.
Policy implementation theory	Policy outcomes depend on communication, resources, structure, and local execution	Explains the gap between regulation and target achievement.

METHOD

This article is based on a qualitative design with descriptive-analytical orientation. The qualitative design is appropriate because the research problem requires understanding of process, meaning, implementation barriers, and strategy formulation. Stunting reduction is not a variable that can be understood only through prevalence data. It is also shaped by how services are organized, how health messages are delivered, how communities respond, how cadres work, how local policy is translated into action, and how cross-sector institutions coordinate. Qualitative inquiry allows these dimensions to be explored in depth.

Data were gathered through in-depth interviews, focus group discussions, and document review. Informants included health workers, posyandu cadres, and community members affected by stunting-related risks. The focus group discussion was used to identify causal factors, program strengths and weaknesses, root problems, and strategy priorities. Document review was used to examine policy targets, local regulations, prevalence reports, program records, and strategic action documents. This combination of sources enabled triangulation between policy documents, implementer perspectives, and community experience.

The analytical process followed qualitative steps consisting of data condensation, data display, conclusion drawing, and verification. Interview and discussion data were grouped according to four research questions: health service conditions, factors causing target non-achievement, effectiveness of policy implementation, and strategy formulation. The analysis also used thematic matrices, SWOT interpretation, regulatory gap analysis, and logical framework mapping. These tools were used not as statistical procedures but as qualitative management instruments for organizing evidence and formulating practical strategy.

Trustworthiness was strengthened through triangulation of sources and methods. Health service data were compared with interview evidence, focus group results, and relevant literature. Policy statements were compared with implementation realities. Community perspectives were used to verify whether formal programs were understood and practiced at household level. The article maintains an anonymized presentation of the source study by focusing only on the research problem, findings, and academic interpretation. See table 2.

Table 2. Data Sources and Analytical Focus

Research focus	Data source	Analytical output
Condition of health services	Interviews, FGD, program documents, service records	Description of ANC, posyandu, immunization, supplementary feeding, and referral services.
Causes of target non-achievement	FGD, community interviews, literature synthesis	Identification of socioeconomic, behavioral, cultural, service, and monitoring factors.

Policy implementation effectiveness	Regulatory documents, program reports, implementer interviews	Evaluation of policy-implementation gap and cross-sector coordination.
Strategy formulation	SWOT, problem tree, logical framework, FGD synthesis	Integrated management model: division of work, promotive, preventive, life-cycle, community-based, integrated, sustainable.

RESULTS AND DISCUSSION

The findings show that health services for stunting reduction in Minahasa Regency are already present through the primary health care network. The system includes puskesmas, posyandu, referral hospitals, and district-level coordination mechanisms. Services cover antenatal care for pregnant women, iron supplementation, supplementary feeding for pregnant women and toddlers, growth monitoring at posyandu, complete basic immunization, and management of children with severe nutritional problems. These services demonstrate that the district has adopted a primary health care orientation with promotive, preventive, and curative elements.

However, the existence of services does not automatically guarantee target achievement. Several limitations were identified in the quality, consistency, and integration of services. Growth monitoring depends heavily on cadres, and differences in measurement skills may influence data accuracy. Community participation remains uneven, especially attendance of pregnant women and toddlers in scheduled services. Nutrition education is available, but not always sufficient to transform household practices related to feeding, parenting, hygiene, and care-seeking behavior. These findings indicate that the service system has a structural foundation but needs stronger educational management. See table 3, and figure 2.

Table 3. Summary of Local Health Service Conditions.

Aspect	Main evidence	Management interpretation
Service network	Puskesmas, posyandu, and referral hospitals provide maternal-child and nutrition services.	The institutional foundation exists, but service quality and follow-up require strengthening.
Specific interventions	ANC, iron tablets, supplementary feeding, immunization, growth monitoring, and management of severe malnutrition.	Interventions are available but must be integrated into a sustained education cycle.
Cross-sector structure	Thirteen regional organizations are involved in specific and sensitive interventions.	Coordination needs operational role clarity and shared accountability.
Data trend	16.5% in 2022; 23.1% in 2023; 19.3% in 2024; 98 children detected in February 2025; 437 at-risk families.	Progress remains unstable; data-driven targeting is necessary.
Measurement coverage	Approximately 95% participation in measurement activities.	Coverage is relatively strong but measurement quality and data harmonization remain important.
Innovation	Stunting ambassadors and adolescent stunting ambassadors.	Youth-based education can strengthen life-cycle prevention.

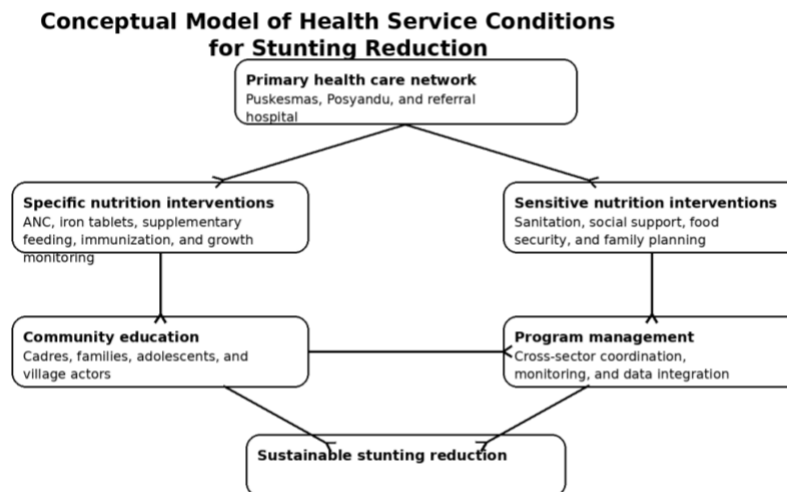


Figure 2. Conceptual model of health service conditions

The local prevalence pattern illustrates both challenge and opportunity. The district prevalence was reported at 16.5 percent in 2022, increased to 23.1 percent in 2023, and later decreased to 19.3 percent in 2024 according to local presentation data. The 2025 measurement found 98 children with stunting, while 437 families were identified as at risk. Measurement participation reached approximately 95 percent, which suggests relatively strong program coverage. Yet the gap between local data and national survey data indicates the need for better data harmonization, clearer interpretation, and a stronger monitoring system.

The causes of target non-achievement are multidimensional. Socioeconomic factors limit household access to diverse and nutritious food. Behavioral factors influence breastfeeding, complementary feeding, hygiene, health service utilization, and compliance with health advice. Cultural factors shape beliefs about pregnancy, child feeding, and care. Service factors include limited human resources, uneven capacity of cadres, equipment constraints, and insufficient follow-up. Governance factors include coordination challenges across sectors and the absence of a fully integrated monitoring system. The evidence indicates that stunting is not a single-sector problem.

Focus group discussion results showed that participants understood stunting as a problem with roots in poor nutrition, limited parenting knowledge, sanitation problems, poverty, and weak coordination. Participants also recognized that policy instruments already exist, including district regulations and action plans. The core issue is that policy translation into continuous community learning remains incomplete. Programs tend to be implemented as activities rather than as a managed cycle of education, behavior change, monitoring, and feedback.

The evaluation of implementation shows a policy-implementation gap. Policies for accelerating stunting reduction have been adopted, and the district has established an acceleration team involving multiple sectors. Yet implementation still faces fragmentation. Health services handle specific nutrition interventions, while other regional organizations are expected to support sensitive interventions such as sanitation, social assistance, food security, and family planning. When role clarity, data sharing, and accountability are not strong enough, cross-sector collaboration becomes formal rather than operational.

An important finding is the need for clearer division of work. The health center level should coordinate program monitoring, nutrition education, maternal care, medical diagnosis, sanitation education, and public health promotion. The posyandu level should conduct weighing, height measurement, family education, parenting support, and early identification of risk. The village level should assist in data collection, family follow-up, and local mobilization. Without clear role distribution, some tasks may overlap while other tasks may be neglected. See table 4, and figure 3.

Table 4. Factors Causing the Stunting Target Gap

Factor category	Empirical indication	Implication for education management
Policy implementation gap	Regulations and action plans exist, but local translation is uneven.	Education programs must be planned with clear targets, actors, and feedback mechanisms.
Human resource limitation	Health workers and cadres face capacity and workload constraints.	Continuous training and division of work are required.
Community behavior	Feeding, hygiene, and care-seeking practices do not always follow health recommendations.	Messages must be repeated, practical, culturally sensitive, and family-centered.
Socioeconomic barriers	Some families face limited access to diverse food and supportive services.	Health education must be connected with social and food-security interventions.
Data fragmentation	Differences appear between survey data and local monitoring records.	Monitoring must integrate local measurement, survey interpretation, and risk-family tracking.
Cross-sector coordination	Specific and sensitive interventions involve many agencies.	Operational coordination must move beyond formal meetings into joint action plans.

Problem Tree of Stunting Target Gap in Minahasa

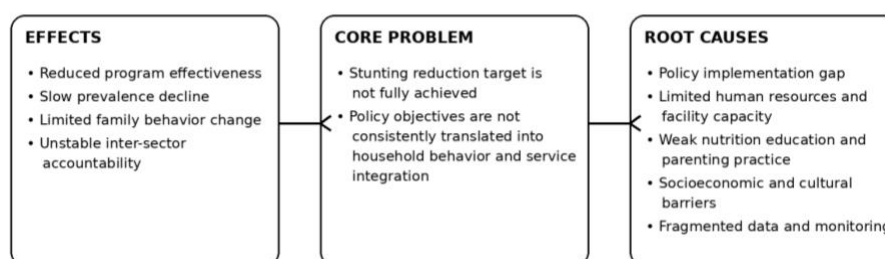


Figure 3. Problem tree of the stunting target gap

The findings also emphasize the importance of promotive and preventive education. Promotive education aims to increase awareness of balanced nutrition, breastfeeding, hygiene, maternal care, and family support. Preventive action focuses on early detection, growth monitoring, anemia screening, iron supplementation, immunization, sanitation, and referral. These two strategies must be integrated. Education without screening may fail to identify risk, while screening without education may fail to change behavior. Therefore, the model must combine health messages, practical demonstration, risk identification, and follow-up.

The life-cycle approach emerged as a strategic principle. Stunting prevention should not begin only when a child is already short. It must begin with adolescents, prospective brides, pregnant women, infants, toddlers, and families. The education system should provide continuous messages that follow the biological and social cycle of risk. Adolescents need anemia prevention and reproductive health education. Pregnant women need nutrition and antenatal care education.

Mothers of infants need breastfeeding support. Families of toddlers need complementary feeding, growth monitoring, and hygiene education.

Community-based action was also identified as a crucial strategy. Cadres and local community actors are not merely volunteers; they are the frontline educators who translate health policy into household practice. Their role is essential because they repeatedly interact with families and understand local context. However, cadres need regular training, supportive supervision, simple educational media, and recognition. Community-based strategy will be weak if cadres are expected to perform complex tasks without capacity support. See table 5, and figure 4.

Table 5. Strategic Interventions for Stunting Reduction

Strategy component	Main action	Expected result
Division of Work	Clarify responsibilities of health centers, nutrition officers, midwives, doctors, sanitarians, health promotion officers, posyandu cadres, village cadres, and district actors.	Reduced overlap, better service coverage, and clearer accountability.
Promotive Education	Provide family-centered nutrition, breastfeeding, complementary feeding, hygiene, and parenting education.	Improved knowledge and health literacy among families.
Preventive Action	Conduct early detection, anemia screening, immunization, growth monitoring, sanitation follow-up, and referral.	Earlier risk identification and reduced chronic growth failure.
Life-Cycle Approach	Target adolescents, prospective brides, pregnant women, infants, toddlers, and families.	Prevention begins before stunting becomes visible.
Community-Based Action	Strengthen cadres, village actors, family mentoring, and local education forums.	Greater participation and local ownership.
Integrated Services	Connect specific nutrition interventions with sanitation, social support, agriculture, family planning, and village governance.	Multidimensional causes are addressed through coordinated action.
Sustainability	Use routine monitoring, capacity building, digital archives, and policy continuity.	Program gains are maintained over time.

Integrated Health Education Management Strategy Model

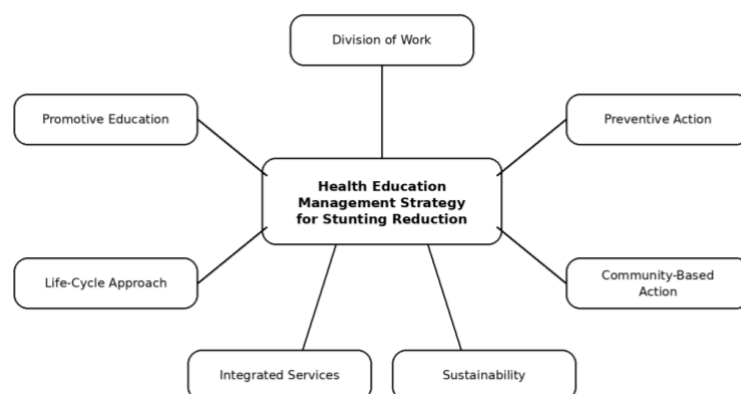


Figure 4. Integrated health education management strategy model

The findings confirm that stunting reduction must be understood as a multidimensional educational management problem. The district has established health services and policy structures, but the target gap persists because the educational and managerial components are not yet strong enough to produce consistent behavior change across families and communities. In management terms, the problem lies not only in input availability but also in process integration. Programs exist, but the connection between planning, role distribution, implementation, monitoring, evaluation, and feedback remains inconsistent.

The first major discussion point concerns the condition of health services. The presence of puskesmas, posyandu, and referral services demonstrates a primary health care foundation. This is aligned with WHO and UNICEF (2020), which emphasize that primary health care is a strategic platform for universal access, health promotion, prevention, and community participation. However, the findings show that primary health care must be strengthened as a learning system. Health services are not only places where children are measured or mothers receive supplements. They are also spaces where families learn how to prevent risk and sustain healthy practices at home.

The second discussion point concerns the gap between service availability and household behavior. Many stunting determinants are located at household level: feeding practices, breastfeeding, hygiene, parenting, care-seeking behavior, and food choices. These behaviors are influenced by knowledge, habit, culture, economic constraints, and family support. Therefore, education should not be delivered only as short counseling during service visits. It should be organized as a continuous learning process using repeated messages, visual media, demonstrations, home visits, and community dialogue. Theoretical support comes from Katuuk and Tarusu (2024), who show that learning effectiveness increases when methods are aligned with learners and supported by appropriate media.

The third discussion point is human resource capacity. The program depends heavily on health workers and cadres. Kambey, Evinita, and Kewo (2022) link competence to organizational performance, while Kambey et al. (2024) emphasize the role of work motivation in performance. This means that the effectiveness of stunting programs depends not only on policy instructions but also on whether implementers understand their roles, possess technical skills, and remain motivated. Cadres need training in accurate measurement, risk communication, family education, and reporting. Health workers need capacity in data-driven planning, supervision, and community engagement.

The fourth discussion point is organizational culture and learning environment. Umbase and Wua (2020) argue that a supportive organizational culture contributes to child-friendly education. In stunting reduction, a supportive culture means that families are not blamed but guided, cadres are not left unsupported, and cross-sector actors are encouraged to collaborate. Umbase et al. (2023) emphasize the importance of managing the learning environment; in community health, this means ensuring that posyandu sessions, family visits, and village forums become safe and constructive spaces for learning. Umbase et al. (2024) further show that managerial capacity and child protection require integrated approaches, reinforcing the need for cross-sector governance in child-centered health programs.

The fifth discussion point is policy implementation. The study found that regulations and action plans are present, but implementation effectiveness is limited by coordination and monitoring challenges. A policy-implementation gap occurs when formal policy objectives are not fully translated into routine practice. This gap is visible when multiple agencies are officially involved but work separately; when data are collected but not used for targeted follow-up; or when education sessions occur but do not produce measurable behavior change. Katuuk et al. (2025) highlight the importance of policy and governance in educational programs. Applied to stunting,

this means that educational management must include clear policy alignment, inter-sector division of labor, and accountability for results.

The sixth discussion point is the need for division of work. Division of work does not merely mean distributing tasks administratively. It means matching tasks with competence, ensuring that each actor understands responsibilities, and establishing coordination pathways. The health center head coordinates and supervises. Nutrition officers manage nutrition education and growth data. Midwives support pregnant women and maternal risk detection. Doctors diagnose developmental complications. Sanitarians provide hygiene and sanitation education. Health promotion officers design communication activities. Cadres conduct weighing, measurement, family reminders, and village-level education. Village actors support data and mobilization. When this system is clear, family education becomes more consistent.

The seventh discussion point is the promotive-preventive balance. Promotive education builds awareness, motivation, and literacy. Preventive action identifies risk and reduces exposure before harm occurs. The findings indicate that both are needed. If services focus only on treatment, stunting will be detected after growth failure occurs. If education focuses only on general messages without measurement and screening, risk families may be missed. The model therefore integrates education with detection: families learn why practices matter, and implementers use screening to prioritize follow-up.

The eighth discussion point is the life-cycle approach. Stunting is often visible in toddlers but begins earlier. Adolescent girls may enter pregnancy with anemia or poor nutrition. Pregnant women may lack antenatal care or dietary support. Infants may not receive exclusive breastfeeding. Toddlers may receive inadequate complementary feeding. Thus, the strategy must cover adolescents, prospective brides, pregnant women, infants, toddlers, and families. Youth ambassadors and adolescent stunting ambassadors can become a strategic innovation because they expand prevention before pregnancy.

The ninth discussion point is integration. The causes of stunting are not only medical. Sanitation, poverty, food security, parenting, education, and social protection are also involved. Therefore, integrated services must connect health offices with social services, family planning, agriculture, village government, schools, and community organizations. Integration should not be limited to ceremonial coordination. It should include shared data, joint targeting of at-risk families, coordinated home visits, integrated village plans, and common evaluation indicators.

The tenth discussion point concerns sustainability. Many programs fail because they depend on short-term campaigns. Sustainable stunting reduction requires institutionalization: annual planning, routine training, monitoring dashboards, standard educational materials, budget continuity, and periodic evaluation. Sustainability also requires community ownership. Families and communities should not only receive assistance; they should participate in identifying risks, maintaining posyandu attendance, improving sanitation, and supporting healthy feeding practices. Sustainability is achieved when stunting prevention becomes a routine social practice, not a temporary project. See table 6, and figure 5.

Table 6. Logical Framework of the Proposed Strategy

Objective level	Indicator	Main activity	Responsible actors
Impact	Lower stunting prevalence and improved child growth outcomes.	Integrated implementation of specific and sensitive interventions.	District government and cross-sector acceleration team.
Outcome	Improved family health literacy and preventive behavior.	Promotive education, preventive screening,	Puskesmas, posyandu cadres,

Output 1	Clear roles across service levels.	family mentoring, and referral. Prepare division-of-work matrix and supervision schedule.	village actors, and families. Health office, puskesmas heads, village government.
Output 2	Better early detection and follow-up.	Growth monitoring, anemia screening, risk-family mapping, and home visits.	Nutrition officers, midwives, cadres, sanitarians.
Output 3	Stronger community participation.	Cadre training, family education, youth ambassadors, and village learning forums.	Cadres, community leaders, schools, youth groups.
Output 4	Improved monitoring and accountability.	Data integration, dashboard review, quarterly evaluation, and feedback meetings.	Health office, OPD partners, data managers.

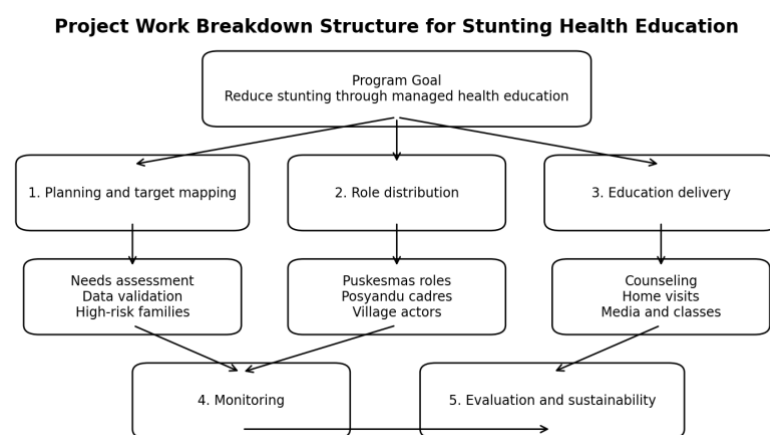


Figure 5. Project work breakdown structure

Proposed Practical Model

The proposed model begins with division of work. Clear division of work is the foundation because stunting reduction involves many actors and tasks. Without role clarity, the program may suffer from duplication, neglected responsibilities, delayed reporting, and weak follow-up. The model places the health office as the coordinator of technical strategy, puskesmas as the manager of primary health services, posyandu cadres as frontline educators, village government as mobilizer and data supporter, and cross-sector OPD as providers of sensitive interventions. The division of work should be documented in a practical matrix that can be used during planning and evaluation meetings.

The second component is promotive education. Promotive education should be designed as a family learning package. It includes messages on maternal nutrition, iron consumption, antenatal care, exclusive breastfeeding, complementary feeding, sanitation, immunization, and child stimulation. The education should use simple language, visual aids, demonstrations, and local examples. It should be delivered not only in health facilities but also in homes, villages, schools, and digital channels. The aim is to build health literacy that families can translate into daily behavior.

The third component is preventive action. Prevention includes early detection, routine measurement, anemia screening, immunization, sanitation assessment, and referral for children with nutrition problems. Preventive action should be linked with data management. When a child

or family is identified at risk, the system should trigger follow-up: counseling, supplementary feeding, home visit, sanitation advice, and referral if needed. Prevention becomes effective when risk information leads to concrete action.

The fourth component is life-cycle orientation. The model treats adolescents, prospective brides, pregnant women, infants, toddlers, and families as connected targets. Education for adolescent girls can reduce anemia before pregnancy. Education for prospective parents can prepare nutrition and parenting readiness. Maternal services can detect pregnancy risks. Breastfeeding support protects infants. Complementary feeding education supports toddlers. This life-cycle chain prevents the program from reacting too late.

The fifth component is community-based implementation. The model assumes that health behavior is shaped in communities. Cadres, village leaders, religious leaders, teachers, and youth ambassadors can reinforce health messages. Community-based action also helps address cultural beliefs and practical barriers. For example, if a family cannot attend posyandu because of work schedules, cadres and village actors can arrange reminders or alternative follow-up. If a family lacks food diversity, village-level support can connect education with food security initiatives.

The sixth component is integrated services. Stunting cannot be solved by the health sector alone. Integrated services connect nutrition with sanitation, water access, social assistance, agriculture, family planning, early childhood education, and village development. Each sector should contribute to a common target and share data on families at risk. Integration also avoids the problem of disconnected programs where different agencies visit the same village without coordination.

The seventh component is sustainability. Sustainability requires budget support, institutional policy, routine training, monitoring systems, and community ownership. The model recommends periodic capacity building for health workers and cadres, digital archiving of growth data and education materials, routine cross-sector evaluation, and continuous improvement based on field feedback. Sustainability means that stunting reduction becomes embedded in the district health education management system. See table 7.

Table 7. Division of Work in the Proposed Model

Level / actor	Core responsibility	Health education function
District health office	Policy coordination, planning, budgeting, monitoring, and evaluation.	Prepare education standards, training modules, and integrated indicators.
Puskesmas head	Coordinate programs, supervise health workers, and ensure service continuity.	Organize local learning sessions and supervise cadres.
Nutrition officer	Monitor nutritional status, analyze growth data, and provide nutrition counseling.	Teach balanced nutrition, complementary feeding, and risk follow-up.
Midwife	Provide antenatal care, maternal education, and pregnancy risk detection.	Educate pregnant women on nutrition, anemia prevention, and early care.
Doctor	Diagnose growth and developmental complications and manage referral.	Explain clinical risks and the importance of timely treatment.
Sanitarian	Assess household sanitation and promote hygiene.	Educate families on clean water, latrines, and infection prevention.
Health promotion officer	Develop health communication and community campaigns.	Design simple media and message reinforcement.

Posyandu cadre	Weighing, measurement, family reminders, local education, and home visits.	Translate health messages into practical household actions.
Village government	Support data collection, mobilization, and local resource allocation.	Integrate stunting education into village forums and development plans.

Extended Implications for Educational Management

The first implication is that health education must be managed as a program, not treated as incidental counseling. In many health programs, education is attached to services but not systematically designed. A mother may receive advice during an antenatal visit, a toddler may be weighed at posyandu, or a cadre may remind a family about feeding. These actions are useful, but they become stronger when organized into a coherent program with objectives, materials, schedules, responsible actors, monitoring indicators, and feedback loops. Educational management provides this structure.

The second implication is that training for cadres and health workers should be continuous. One-time training is insufficient because stunting programs require repeated measurement, updated policy knowledge, communication skills, and problem-solving capacity. Continuous professional development should include measurement practice, counseling simulations, case discussions, family mentoring techniques, data reporting, and use of educational media. Kambey et al. (2024) suggest that work motivation and individual characteristics influence performance, implying that training should be supported by recognition, supervision, and meaningful role design.

The third implication concerns learning materials. Health education materials should be adapted to local language, culture, and literacy levels. Families need practical guidance rather than abstract messages. For example, instead of only saying “provide balanced nutrition,” materials should show affordable local food combinations, meal frequency by child age, breastfeeding techniques, and hygiene steps. Katuuk and Kowal (2024) highlight the importance of instruments that enable measurable learning. In stunting education, modules and media should therefore be linked to specific competencies such as identifying diverse food groups or reading a growth chart.

The fourth implication is that data should be used pedagogically. Data are often treated as administrative reports, but they can also guide education. If data show that a village has many at-risk families, education can be intensified there. If many mothers miss antenatal visits, messages can focus on pregnancy care. If measurement errors are suspected, cadres can receive targeted retraining. Data-driven education enables the program to move from general campaigns to targeted learning interventions.

The fifth implication is that community participation should be managed. Participation is not automatically effective. Communities need roles, information, motivation, and feedback. Village leaders can support attendance, cadres can conduct home visits, schools can educate adolescents, and families can monitor feeding practices. Educational management must coordinate these roles and ensure that community action remains aligned with health evidence. Umbase et al. (2024) emphasize the need for integrated child-focused management, which is highly relevant because stunting prevention is part of child protection and human development.

The sixth implication is that policy evaluation should include education indicators. Many evaluations focus on prevalence and service coverage. These indicators are important, but they do not fully explain whether families understand and practice recommended behaviors. Evaluation should therefore include family knowledge, breastfeeding practice, complementary feeding diversity, hygiene behavior, posyandu attendance, cadre counseling quality, and satisfaction with education. Such indicators help determine whether the education management system is functioning.

The seventh implication is that cross-sector integration should be translated into shared work plans. Coordination meetings are useful, but they are not enough. Each sector should have defined outputs: social services identify vulnerable families, agriculture supports food diversity, sanitation programs improve hygiene infrastructure, education institutions support adolescent awareness, family planning supports reproductive preparation, and health services coordinate nutrition-specific interventions. Shared work plans reduce fragmentation and make accountability visible.

The eighth implication is that technology can support monitoring and learning. Digital tools can store growth data, remind families of posyandu schedules, archive education materials, and help managers identify risk clusters. However, technology should not replace human interaction. It should support cadres and health workers in delivering more consistent education. Technology is most useful when combined with community trust and direct mentoring.

The ninth implication is that sustainability depends on institutional memory. Programs often change when leaders change or when funding cycles end. To avoid this, the model should be documented in standard operating procedures, local regulations, training manuals, and annual planning documents. Cadre training records, family-risk databases, educational materials, and evaluation reports should be archived so that new implementers can continue the program.

The tenth implication is that the proposed model can be adapted to other districts with similar problems. The model is rooted in Minahasa conditions, but its logic is transferable. Many districts face the same combination of health service availability, behavior-change challenges, data fragmentation, and cross-sector coordination barriers. The model offers a practical framework that can be adjusted to local culture, administrative structure, and resource availability.

Recommendations for Implementation and Research Contribution

The first recommendation is to institutionalize a district health education management team for stunting reduction. This team should not duplicate the role of existing acceleration structures, but should function as the technical engine that converts policy into educational action. Its duties should include preparing annual education plans, designing standardized counseling materials, coordinating cadre training, managing monitoring data, and facilitating cross-sector evaluation. Such a team would help ensure that health education is not fragmented across programs but managed as one coherent strategy.

The second recommendation is to develop a district-level curriculum for family stunting education. The curriculum should be simple, practical, and modular. Modules can include adolescent anemia prevention, pregnancy nutrition, antenatal care, exclusive breastfeeding, complementary feeding, sanitation and hygiene, immunization, child stimulation, and growth chart interpretation. Each module should contain learning objectives, key messages, visual media, practice activities, and indicators for evaluation. This curriculum would help health workers and cadres deliver consistent messages across villages and service points.

The third recommendation is to strengthen posyandu as a community learning center. Posyandu should not only function as a place for weighing and measuring children. It should become a monthly learning forum where families receive short, practical, and repeated education. Cadres can demonstrate age-appropriate food preparation, teach mothers how to read growth monitoring results, and discuss common misconceptions about child feeding. This approach aligns with community-based education because learning occurs within the social setting where behavior is practiced.

The fourth recommendation is to create a risk-family mentoring system. Families identified as at risk should receive more intensive follow-up than the general population. Follow-up may include home visits, tailored counseling, referral support, sanitation assessment, and connection with social or food security programs. A simple risk register can record household risk status,

interventions received, and follow-up schedule. This recommendation responds to the finding that data exist but must be connected more directly with educational and service actions.

The fifth recommendation is to integrate education with sensitive interventions. Families may understand nutrition messages but still face barriers such as poverty, food access, water, and sanitation. Therefore, educational management must be connected with social assistance, village food gardens, clean water programs, latrine improvement, and family planning. In practice, this means that cross-sector meetings should begin from a list of at-risk families and villages, then assign specific responsibilities to each sector. Integration becomes meaningful when it changes the conditions that families face.

The sixth recommendation is to use digital tools carefully. Digital tools can assist with reminders, data storage, educational materials, and reporting. However, digitalization should be appropriate to local capacity. A simple shared dashboard, WhatsApp-based reminder system, or digital folder of approved education materials may be more useful than complex systems that cannot be maintained. Technology should serve learning and follow-up, not create additional administrative burden for cadres and health workers.

The seventh recommendation is to evaluate the program through both prevalence and learning indicators. Prevalence is the final outcome, but it changes slowly. Learning indicators can show whether the management system is improving before prevalence changes appear. These indicators may include maternal knowledge, cadre counseling competence, posyandu attendance, exclusive breastfeeding practice, complementary feeding diversity, household hygiene practice, and completion of follow-up for at-risk families. Such indicators help managers identify which part of the education chain requires improvement.

The final recommendation is to maintain policy continuity through local regulations, budget allocation, and routine reporting. Stunting reduction requires a long time horizon, while government programs often operate within annual budget cycles. To avoid discontinuity, the strategy should be embedded in district planning documents, puskesmas work plans, village development planning, and cross-sector evaluation forums. This will help ensure that the educational management model remains active even when program personnel change.

The research contribution of this article is the formulation of a practical bridge between educational management and public health action. It shows that stunting reduction is not only a matter of nutrition input but also a matter of managing learning, behavior, and coordination. The article contributes to theory by applying educational management concepts to district-level health education. It contributes to practice by offering an operational model that combines division of work, promotive education, preventive action, life-cycle orientation, community-based implementation, integrated services, and sustainability.

CONCLUSION

This article concludes that health services for stunting reduction in Minahasa Regency have been implemented through primary health care mechanisms involving puskesmas, posyandu, referral services, and cross-sector coordination. The services include antenatal care, iron supplementation, supplementary feeding, immunization, growth monitoring, nutrition counseling, and management of children with nutritional problems. However, the target has not been fully achieved because service availability has not yet been matched by fully integrated educational management, consistent behavior change, sufficient human resource capacity, and strong data-based coordination. The factors causing the target gap are multidimensional. They include socioeconomic vulnerability, limited food access, cultural and behavioral practices, insufficient

family nutrition literacy, human resource constraints, measurement challenges, fragmented monitoring, and weak operational integration across sectors. These factors show that stunting reduction requires more than medical intervention. It requires a managed education system that builds knowledge, changes practices, supports families, and coordinates institutions. The proposed model consists of seven strategic components: Division of Work, Promotive Education, Preventive Action, Life-Cycle Approach, Community-Based Action, Integrated Services, and Sustainability. The model reframes stunting reduction as a structured learning and governance process. It emphasizes that each actor must have clear responsibilities, health education must be practical and continuous, prevention must begin before risk becomes visible, communities must be actively involved, services must be integrated, and monitoring must support sustainable improvement.

The article contributes to educational management by applying concepts of planning, organization, implementation, monitoring, and evaluation to a public health problem. The theoretical contribution lies in connecting educational management, health literacy, primary health care, community-based education, and policy implementation. The practical contribution is a model that can guide district governments, health offices, puskesmas, posyandu cadres, and cross-sector actors in strengthening stunting reduction efforts through health education management.

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