

# Implementation of the Holistic Integrative Early Childhood Education Program in Preventing Stunting in Aceh Tamiang Regency

Ulfa Rismaya Putri<sup>1\*</sup>, Diana<sup>1</sup>, Ali Formen<sup>1</sup>

<sup>1</sup>Early Childhood Education, Faculty of Education and Psychology, Universitas Negeri Semarang, Semarang, Indonesia

Received: December 21, 2025

Revised: March 09, 2026

Accepted: March 25, 2026

Published: March 31, 2026

Corresponding Author:

Ulfa Rismaya Putri

[ulfarismayaputriunnes96@gmail.com](mailto:ulfarismayaputriunnes96@gmail.com)

DOI: [10.29303/jppipa.v12i3.14024](https://doi.org/10.29303/jppipa.v12i3.14024)

 Open Access

© 2026 The Authors. This article is distributed under a (CC-BY License)



**Abstract:** Stunting remains a major public health issue in Indonesia due to its long-term effects on children's growth, cognitive development, and future productivity. Despite government efforts, the implementation of integrated stunting prevention programs at the early childhood education level remains inconsistent. This study aims to analyze the implementation of the Holistic Integrative Early Childhood Education (HI-ECE) program in preventing stunting in Aceh Tamiang Regency. A qualitative case study approach was employed involving 30 participants consisting of early childhood educators, principals, health workers, village officials, and parents from two early childhood education centers. Data were collected through in-depth interviews, observations, and document analysis. The data were analyzed using the interactive model of data reduction, data display, and conclusion drawing, supported by triangulation to ensure data credibility. The results show that educational services are the most consistently implemented component, particularly through the integration of hygiene, health, and nutrition awareness into daily learning activities. However, health, nutrition, caregiving, and child protection services remain limited and depend largely on external programs. Weak cross-sectoral coordination, limited human resources, and inconsistent parental participation hinder effective implementation. The study concludes that strengthening institutional capacity, formalizing intersectoral collaboration, and increasing parental engagement are essential to optimize early childhood education institutions as convergence points for sustainable stunting prevention.

**Keywords:** Cross sectoral coordination; Early childhood education; Holistic integrative approach; Implementation; Stunting prevention

## Introduction

Stunting remains a serious challenge in human resource development due to its long-term impact on health, cognitive capacity, and productivity in adulthood. This condition of impaired growth in early childhood is associated with chronic nutritional deficiencies as well as inadequate caregiving, health, and educational environments. Evidence shows that stunting is closely related to disruptions in brain development and cognitive functioning that may persist throughout the life course (Sideropoulos et al.,

2025; Suryawan et al., 2022; Wijekumar et al., 2023). Research also indicates that children who experience stunting tend to have lower cognitive performance and educational outcomes later in life, highlighting the long-term consequences of early nutritional deprivation (Lestari et al., 2024; Suryawan et al., 2022).

Early childhood represents a critical period for establishing optimal growth and development. Physical, cognitive, social, and emotional development progresses rapidly during this stage and is highly sensitive to environmental stimulation. Evidence indicates that the quality of nutrition, caregiving, and

## How to Cite:

Putri, U. R., Diana, D., & Formen, A. (2026). Implementation of the Holistic Integrative Early Childhood Education Program in Preventing Stunting in Aceh Tamiang Regency. *Jurnal Penelitian Pendidikan IPA*, 12(3), 100-112. <https://doi.org/10.29303/jppipa.v12i3.14024>

early stimulation during the first years of life plays a decisive role in shaping brain architecture and long-term developmental outcomes (Black et al., 2017; Britto et al., 2017; Richter et al., 2017). Disruptions in these foundational conditions during early childhood may therefore lead to long-term consequences for children's health, learning capacity, and overall well-being (Jeong et al., 2021; World Health Organization et al., 2018).

Stunting remains one of the major challenges affecting child development in many developing countries. This condition is closely associated with chronic nutritional deficiencies, inadequate health services, poor sanitation, and suboptimal caregiving practices. Stunting prevention therefore requires an integrated multisectoral approach because its determinants are multidimensional. Nutritional intake, health services, sanitation, caregiving practices, and educational stimulation interact to influence child growth and development. Recent studies indicate that integrated and multisectoral interventions addressing nutrition, health, sanitation, and early childhood stimulation are more effective in reducing stunting prevalence compared to single-sector approaches (Bhutta et al., 2020; Hoddinott et al., 2021; Prendergast & Humphrey, 2019).

Early childhood education institutions hold strategic potential in supporting stunting prevention efforts. These institutions operate in close proximity to children and families and function not only as learning environments but also as platforms for promoting health, nutrition, caregiving, and child protection. Through daily learning activities and interactions with families, early childhood education units can facilitate the integration of developmental stimulation and healthy behavioral practices. Evidence indicates that early childhood education programs that integrate health promotion, nutrition education, and family engagement contribute significantly to improving child development and well-being. A holistic and integrative approach enables early childhood institutions to support the comprehensive fulfillment of children's developmental needs through coordinated services across sectors (Neuman & Devercelli, 2019; UNESCO, 2022; UNICEF, 2023).

The Holistic Integrative Early Childhood Education program was developed to integrate education, health, nutrition, caregiving, and protection services into a unified system of child development services. Effective implementation of this program requires collaboration among multiple stakeholders, including educators, health professionals, parents, and local governments. Such collaboration reflects the principles of collaborative governance in public policy implementation, where coordination across sectors is essential for achieving shared development goals and

improving service effectiveness (Emerson & Nabatchi, 2018; Sørensen & Torfing, 2018). (Jeong et al., 2021)

Previous studies indicate that integrated early childhood development programs contribute positively to stunting prevention and overall child development outcomes. Programs that combine early learning stimulation, nutrition interventions, health services, and family engagement have been shown to improve children's developmental outcomes and health status. Nevertheless, the implementation of integrated programs often faces institutional challenges such as limited human resources, insufficient educator capacity, weak intersectoral coordination, and limited policy support (Jeong et al., 2021; Vaivada et al., 2020).

Educator competence and parental involvement play critical roles in determining the success of holistic integrative program implementation. Early childhood educators are required to possess pedagogical and professional competencies as well as interdisciplinary knowledge related to health, nutrition, and caregiving in order to support integrated child development services (Kulaksız & Toran, 2022; Siraj et al., 2022). Parental engagement is equally important because caregiving practices and nutrition literacy within the household strongly influence the sustainability of interventions delivered through early childhood education programs (Bruening et al., 2022; Levickis et al., 2022). Local socio-cultural conditions and policy contexts also influence program implementation across different regions (Levickis et al., 2022; Rusdi et al., 2024).

Previous studies have discussed the importance of the Holistic Integrative Early Childhood Education approach in supporting child development and stunting prevention outcomes. Most existing research focuses on conceptual discussions, policy frameworks, or general program outcomes. Empirical studies examining how holistic integrative services are implemented in practice at the institutional level of early childhood education units remain limited, particularly in specific local contexts where coordination among sectors and community participation may vary (Kulaksız & Toran, 2022; Lestari et al., 2024; Levickis et al., 2022; Rusdi et al., 2024). This limitation highlights the need for in-depth research that examines the dynamics of program implementation and stakeholder collaboration in real educational settings.

Aceh Tamiang Regency is one of the regions that continues to face challenges related to stunting among young children. Early childhood education units in this region have the potential to function as frontline institutions for implementing holistic integrative services to support stunting prevention. Therefore, this study aims to examine the implementation of the

Holistic Integrative Early Childhood Education program in preventing stunting in Aceh Tamiang Regency. The novelty of this research lies in its focus on analyzing the practical implementation of integrated services at the institutional level by exploring the perspectives of multiple stakeholders, including educators, health workers, village officials, and parents. Through a qualitative approach, this study provides empirical insights into cross-sectoral coordination, community involvement, and institutional practices that influence the effectiveness of holistic integrative early childhood education in supporting sustainable stunting prevention. Qualitative case studies on cross-sector coordination in stunting reduction show that collaborative governance involving local government, health agencies, community groups, and informal networks plays a key role in shaping policy implementation at the local level, affecting how services are delivered and sustained (Agustiani et al., 2025; Putri et al., 2024; Saleh et al., 2024). Evidence from related qualitative research indicates that community-based support structures and integrated service mechanisms improve coordination outcomes and strengthen multi-stakeholder engagement in stunting prevention efforts (Kinayungan et al., 2022; Saleh et al., 2024).

## Method

### Conceptual Framework of the Study



Figure 1. Conceptual Framework

Stunting in early childhood is a multidimensional challenge shaped by the interaction of nutrition, health, caregiving, and educational stimulation. The Holistic Integrative Early Childhood Education approach is relevant for early stunting prevention because it integrates education, health, nutrition, caregiving, protection, and welfare services within a convergent system. This framework assumes that effective prevention depends not only on nutrition specific interventions but also on sensitive interventions delivered through education and caregiving, with early childhood education units serving as key convergence points. Program effectiveness is determined by the quality of implementation, which is influenced by actor understanding, resource availability, intersectoral coordination, and institutional commitment.

### Research Design and Procedure

This study employed a qualitative approach aimed at gaining an in depth understanding of the implementation of the Holistic Integrative Early Childhood Education program in preventing stunting in early childhood education units in Aceh Tamiang Regency. A qualitative approach was chosen because it allows for the exploration of meanings processes and program dynamics in a contextual manner based on the experiences perceptions and practices of actors involved in the field. This approach enables researchers to obtain a comprehensive understanding of social realities that cannot be adequately explained through quantitative measurement alone.

The research design adopted was a case study. This design was selected because the study focused on a specific phenomenon namely the implementation of Holistic Integrative Early Childhood Education within a particular regional context. The case study design allowed for an in-depth examination of various aspects of program implementation including planning execution intersectoral coordination and the involvement of parents and the community in stunting prevention efforts within early childhood education units. This design also provided opportunities to identify gaps between policy formulation and field level practice.

The research procedure began with a preparation stage that included a literature review formulation of research focus and obtaining necessary permissions from relevant authorities. The subsequent stage involved data collection through in depth interviews observations and document analysis. Interviews were conducted with early childhood education center principals' educators administrative staff health workers and village government representatives involved in the implementation of the Holistic Integrative Early Childhood Education program.

Observations were carried out to directly examine integrated service practices within early childhood education units while documentation was reviewed to analyze relevant policies programs and activity reports.

Data analysis was conducted simultaneously from the initial stage of data collection using an interactive analysis technique that included data reduction data display and conclusion drawing. Collected data were categorized based on research themes to facilitate the identification of patterns and relationships among phenomena. The analysis process was carried out continuously until data saturation was achieved.

Data trustworthiness was ensured through source technique and time triangulation. Triangulation was conducted by comparing findings from interviews observations and document analysis to ensure consistency of information. In addition, researchers performed member checking by reconfirming data with informants to enhance the accuracy and credibility of the research findings.

#### *Research Subjects and Research Site*

The research subjects consisted of individuals directly involved in the implementation of the Holistic Integrative Early Childhood Education program for stunting prevention in Aceh Tamiang Regency. Participants were selected using purposive sampling to ensure the inclusion of information rich cases relevant to the objectives of qualitative research (Creswell, 2018). The participants included early childhood education teachers' principals' health workers or community health volunteer's village government representatives and parents who played active roles in planning implementing and supporting holistic integrative services at the early childhood education unit level. Participant selection was based on criteria including active involvement in the program a minimum of one year of experience in early childhood education or related services adequate understanding of stunting prevention activities and willingness to provide open and reflective information. A total of thirty participants from two early childhood education units were involved in the study with the final number determined by the principle of data saturation rather than numerical representation.

The research was conducted in two early childhood education units located in Aceh Tamiang Regency Aceh Province. The sites were selected purposively based on their relevance to the focus of the study on the implementation of the Holistic Integrative Early Childhood Education program in stunting prevention. Aceh Tamiang Regency was chosen because stunting among young children remains a public health concern and multisectoral programs involving early childhood education units' health

services and village governments have been implemented in the area. The selected sites met specific criteria including the implementation of holistic integrative services in accordance with established guidelines collaboration with health service providers such as community health centers or integrated health posts and active parental involvement in child caregiving health and nutrition related activities.

#### *Data and Data Sources*

The study employed qualitative data consisting of in-depth descriptions of the implementation of the Holistic Integrative Early Childhood Education program in stunting prevention at early childhood education units in Aceh Tamiang Regency. The data focused on understanding implementation processes meanings and integrated service practices within real life contexts. Primary data were derived from in depth interviews observations and documentation that captured the integration of education health nutrition caregiving and child protection services as well as stakeholder roles in program implementation. Supporting documents such as activity plans child development records collaboration reports and village policy archives related to stunting prevention were used to strengthen and validate the findings through triangulation (Moleong, 2019).

Data sources comprised primary and secondary sources. Primary data were obtained directly from teacher's principals health workers village officials and parents involved in the Holistic Integrative Early Childhood Education program through interviews observations and documentation. Secondary data were collected from official guidelines policies institutional reports integrated health post records village planning documents and relevant academic literature. The use of multiple data sources enabled a comprehensive and credible analysis of program implementation through source and method triangulation as recommended by Miles Huberman and Saldaña (2018).

#### *Data Collection Techniques*

Data collection in this study was conducted qualitatively to obtain an in depth understanding of the implementation of the Holistic Integrative Early Childhood Education program in stunting prevention at early childhood education units in Aceh Tamiang Regency. Data were collected through moderate participant observation in depth semi structured interviews and document analysis to ensure comprehensive and complementary findings through method triangulation. Observations focused on integrated educational health nutrition caregiving and child protection practices including child growth monitoring healthy behavior habituation parental

involvement and intersectoral coordination. In depth interviews were conducted with teachers' principals' health workers village officials and parents to explore their experiences perceptions and views regarding program implementation integrated services collaboration and supporting and inhibiting factors. Document analysis involved the review of institutional activity plans child development records integrated health post reports collaboration documents and relevant village and institutional policies to verify consistency between planning and field practices. Data collection and analysis were conducted simultaneously and iteratively until data saturation was achieved indicated by repetitive information and the absence of new significant findings.

#### *Data Validity Techniques*

Data validity in this qualitative study was ensured through the application of trustworthiness criteria, including credibility, transferability, dependability, and confirmability. Credibility was enhanced through source and method triangulation by comparing data obtained from multiple participants and across observations, in depth interviews, and document analysis, supported by member checking to confirm the accuracy of interpretations. Transferability was addressed by providing rich contextual descriptions of the research setting, participants, and implementation processes, enabling readers to assess the applicability of the findings to similar contexts. Dependability was ensured through a clear and systematic documentation of the research procedures, while confirmability was strengthened through researcher reflexivity and the preservation of empirical evidence to ensure that the findings were grounded in the data rather than personal bias.

#### *Data Collection Techniques*

Data were collected through tests, observations, and documentation. Tests were used to measure Hijaiyah letter recognition skills through pretest and posttest instruments. Observations were conducted to assess the implementation of the Al-Bayan method and children's engagement during learning activities. Documentation was used to obtain supporting data, including school profiles, lesson plans, and relevant administrative records.

#### *Data Analysis Techniques*

Data analysis in this study followed the interactive analysis model proposed by Miles, Huberman, and Saldaña (2014), which consists of data reduction, data display, and conclusion drawing and verification. Data reduction involved selecting, focusing, simplifying, and organizing raw data obtained from observations, in

depth interviews, and document analysis to ensure relevance to the research focus on the implementation of the Holistic Integrative Early Childhood Education program in stunting prevention. This process included coding and categorizing data into key themes such as educational services caregiving health and nutrition child protection and intersectoral collaboration to identify patterns actor roles and supporting and inhibiting factors. Reduced data were then presented through descriptive narratives thematic tables matrices and direct quotations to facilitate systematic interpretation and to examine relationships across categories and variations in practice. Conclusion drawing was conducted iteratively throughout the research process with emerging interpretations continuously verified through additional data collection cross source comparison peer debriefing and member checking. The analysis was carried out simultaneously with data collection until data saturation was reached ensuring that the final conclusions accurately reflected empirical conditions and were grounded in robust evidence.

#### *Research Ethics*

This study adhered to established research ethics to ensure respect for participants' rights dignity and wellbeing in accordance with the ethical guidelines of the American Educational Research Association (AERA, 2011) and Indonesian academic standards. Informed consent was obtained through clear explanations of the research purpose procedures and voluntary nature of participation with the right to withdraw at any time. Confidentiality and anonymity were maintained through the use of pseudonyms and secure data handling. The study upheld the principle of nonmaleficence by minimizing potential physical psychological or social risks and ensuring that research activities did not disrupt educational practices. Academic integrity and social responsibility were maintained through honest reporting accurate citation and the constructive dissemination of findings to support improvements in Holistic Integrative Early Childhood Education and stunting prevention efforts.

#### *Conceptual Research Methodology*

The research methodology of this study is designed to systematically explore the implementation of the Holistic Integrative Early Childhood Education program in preventing stunting among young children. This study employs a qualitative approach with a case study design to obtain an in-depth understanding of processes practices and interactions occurring at the institutional and community levels.

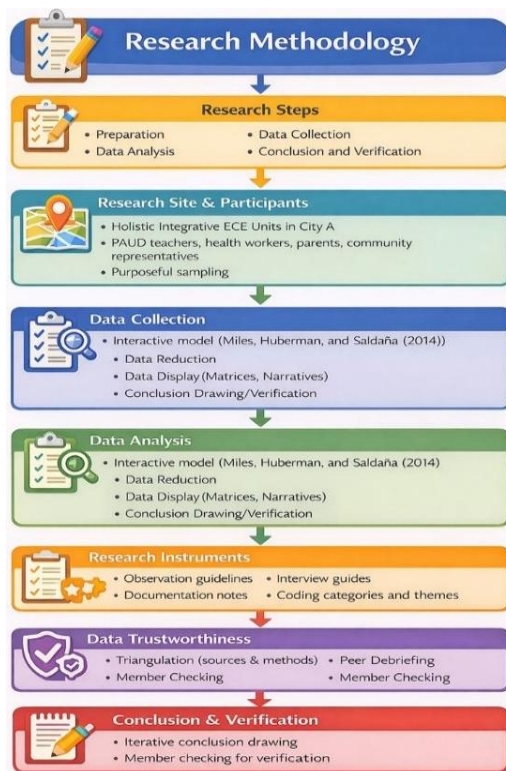


Figure 2. Research Methodology

Data are collected through observations in-depth interviews and document analysis involving key stakeholders including early childhood educators health workers parents and local government representatives. An interactive data analysis model is

applied to interpret the data through data reduction data display and conclusion drawing supported by strategies to ensure data trustworthiness. This methodological framework enables a comprehensive and contextual examination of how holistic integrative services are implemented and how they contribute to stunting prevention efforts.

## Results and Discussion

### Results

#### Implementation of Holistic Integrative Early Childhood Education Services

The findings on the implementation of Holistic Integrative Early Childhood Education services were obtained through in-depth interviews with key informants and direct observations conducted in early childhood education units. The analysis focused on how integrated services covering education health nutrition caregiving and child protection were implemented in daily practices. The triangulation of interview data and observational evidence allows for a comprehensive understanding of the extent to which holistic integrative principles have been translated from policy into practice. The results are presented in Table 1 to illustrate the alignment and discrepancies between stakeholder perspectives and actual implementation in the field.

Table 1. Implementation of Holistic Integrative Early Childhood Education Services Based on in Depth Interviews and Observations

Service Component	Informant Statements in Depth Interviews	Observation Findings
Educational Services	“In learning activities, we always include habits like washing hands brushing teeth and talking about healthy food because it is related to children’s growth and development.” (Teacher)	Daily routines included handwashing before and after activities clean classroom arrangements and learning themes related to health and hygiene.
Health Services	“Health checks are usually conducted together with the community health post but not regularly at school because it depends on the schedule from the health center.” (Principal)	Growth monitoring and immunization activities were observed only during scheduled health service visits and not as routine ECE activities.
Nutrition Services	“We give information to parents about nutritious food but the school does not provide additional meals due to limited funds.” (Teacher)	No regular supplementary feeding programs were observed and nutrition services were mainly delivered through counseling and posters.
Caregiving and Parenting Services	“Parents are invited to parenting sessions but not all parents can attend because of work and other responsibilities.” (Parent)	Parenting activities were observed during specific meetings with varying levels of parental attendance and participation.
Child Protection Services	“We try to make the school safe and comfortable for children although there is no specific written child protection procedure.” (Principal)	The school environment appeared safe and child friendly but formal child protection guidelines were not visibly displayed.
Integrated Service Coordination	“Coordination with health workers and village officials exists but usually only when there is a program or special activity.” (Village Official)	No regular coordination meetings or formal collaboration mechanisms were observed at the institutional level.

The results presented in Table 1 show that educational services are the most consistently implemented component of Holistic Integrative Early Childhood Education, with teachers actively integrating health related messages and clean and healthy living behaviors into daily learning activities, as confirmed by observational evidence of routine practices such as handwashing, classroom cleanliness, and health themed learning. These findings indicate that early childhood education units have the institutional capacity to deliver nutrition sensitive interventions through educational and behavioral habituation approaches. However, significant gaps remain in the implementation of health, nutrition, caregiving, and child protection services, which are largely dependent on external support from health centers and village programs and are not yet systematically embedded in institutional routines. Informal and program based cross sectoral coordination, varying levels of parental participation, and the absence of formal child protection mechanisms suggest that holistic integrative implementation has not

reached an optimal level, highlighting the need for stronger institutional coordination, clearer operational guidelines, and sustained capacity building to enhance the effectiveness of Holistic Integrative Early Childhood Education in preventing stunting.

*Cross Sectoral Coordination and Collaboration*

The analysis of cross sectoral coordination and collaboration focuses on the interaction and partnership among early childhood education units' health services village governments and parents in implementing Holistic Integrative Early Childhood Education for stunting prevention. Data were collected through in depth interviews and direct observations to capture both perceived and actual coordination practices. The triangulation of these data sources provides insight into the structure intensity and sustainability of intersectoral collaboration. The findings are summarized in Table 2 to illustrate patterns of coordination and the extent of service integration at the institutional level.

**Table 2.** Cross Sectoral Coordination and Collaboration Based on In Depth Interviews and Observations

Coordination Aspect	Informant Statements in Depth Interviews	Observation Findings
Coordination with Health Services	"We work with the health center mainly during immunization or growth monitoring programs but there is no fixed coordination schedule." (Principal)	Coordination activities were observed only during specific health service visits and not as part of routine institutional planning.
Collaboration with Village Government	"The village supports stunting programs but ECE is usually involved only when there is a specific village activity." (Village Official)	ECE involvement in village stunting programs was observed to be program based rather than continuous.
Intersectoral Communication	"Communication between ECE and health workers is informal usually through personal contact." (Teacher)	No formal communication mechanisms such as coordination meetings or written agreements were observed.
Joint Planning Activities	"Program planning is done separately because each institution has its own schedule and responsibilities." (Health Worker)	There was no evidence of joint planning documents or integrated annual programs.
Information Sharing	"Information about child growth is shared when needed but not recorded in a shared system." (Teacher)	Documentation related to shared data on child development and nutrition was limited.
Sustainability of Collaboration	"Collaboration depends on the current program or funding availability." (Village Official)	Long term collaboration frameworks were not observed at the institutional level.

The findings in Table 2 indicate that cross sectoral coordination in the implementation of Holistic Integrative Early Childhood Education remains limited and predominantly informal, with collaboration between early childhood education units, health services, and village governments occurring mainly during specific programs such as immunization, growth monitoring, and stunting campaigns. Both interview and observational data show the absence of

structured coordination mechanisms, including formal agreements, regular coordination meetings, joint planning, and systematic information sharing. As a result, early childhood education units have not yet functioned optimally as convergence points for education, health, and family empowerment services. The sustainability of collaboration is largely dependent on external programs and funding rather than long term institutional commitment, which constrains the

effectiveness of integrated service delivery and highlights the need for formalized coordination structures, clear role delineation, and continuous intersectoral engagement to strengthen stunting prevention efforts.

*Parental and Community Involvement*

The findings related to parental and community involvement examine the extent to which parents and community actors participate in the implementation of Holistic Integrative Early Childhood Education and stunting prevention efforts. Data were obtained

through in-depth interviews with parents’ educators and village representatives as well as direct observations of parenting activities and community-based programs. The triangulation of these data sources provides an understanding of participation patterns levels of engagement and the challenges encountered. The results are presented in Table 3 to illustrate the forms and intensity of parental and community involvement in supporting holistic integrative services.

**Table 3.** Parental and Community Involvement Based on in Depth Interviews and Observations

Involvement Aspect	Informant Statements in Depth Interviews	Observation Findings
Parental Participation in ECE Activities	“Parents are invited to parenting and health activities but not all parents can attend due to work and time constraints.” (Parent)	Attendance in parenting sessions varied and some activities were attended by only a portion of parents.
Parental Awareness of Stunting	“Some parents already understand stunting but others still think it is only about child height.” (Teacher)	Information materials on child growth and nutrition were present but not consistently discussed in daily interactions.
Home Based Care Practices	“At school children are taught healthy habits but at home it depends on the parents.” (Teacher)	Differences were observed in children’s hygiene and nutrition habits indicating varying levels of parental practice.
Community Organization Involvement	“Community organizations are usually involved during health campaigns not in daily ECE activities.” (Village Official)	Community involvement was observed mainly during posyandu or special health programs.
Support from Village Institutions	“The village supports stunting programs but coordination with ECE is still limited.” (Village Official)	Village support was visible during specific programs but not integrated into ECE planning.
Sustainability of Participation	“Participation depends on the activity and sometimes decreases over time.” (Parent)	Long term engagement mechanisms for parents and community members were not observed.

The findings presented in Table 3 show that parental involvement plays an important but inconsistent role in the implementation of Holistic Integrative Early Childhood Education, with participation mainly occurring through parenting education sessions and health related activities facilitated by ECE units and health services. However, parental engagement varies due to time constraints, work commitments, and differing levels of awareness regarding stunting prevention, resulting in participation that is largely activity dependent rather than continuous. Community involvement is similarly limited, occurring primarily through health campaigns and posyandu activities coordinated by village institutions, while community organizations and village stakeholders are not yet fully integrated into routine ECE programs. This limited engagement reduces the potential of community-based support systems to reinforce holistic child development

practices at the household level, highlighting the need to strengthen parental education, sustained engagement strategies, and community partnerships to enhance the effectiveness of Holistic Integrative Early Childhood Education in stunting prevention.

*Supporting and Inhibiting Factors*

This section presents the factors that support and hinder the implementation of the Holistic Integrative Early Childhood Education program in stunting prevention efforts. Data were derived from in depth interviews with educators’ principals’ health workers village officials and parents, as well as field observations. Identifying these factors is essential to understand the conditions that facilitate or constrain the effectiveness of program implementation. The findings are summarized in Table 4 to highlight key supporting and inhibiting factors identified in the field.

**Table 4.** Supporting and Inhibiting Factors Based on in Depth Interviews and Observations

Factor Type	Informant Statements in Depth Interviews	Observation Findings
Commitment of Educators	“Teachers are committed to integrating health and hygiene practices into daily learning activities.” (Principal)	Educators consistently implemented routine health related behaviors in classroom activities.
Availability of Guidelines	“There are general guidelines for Holistic Integrative ECE but technical implementation is still unclear.” (Teacher)	Guideline documents were available but not always translated into operational procedures.
Collaboration with Health Services	“Health workers support growth monitoring activities when there is a scheduled program.” (Health Worker)	Health service involvement was observed during specific programs only.
Limited Human Resources	“We have limited staff to manage additional programs outside teaching.” (Teacher)	Teachers handled multiple roles which limited program expansion.
Weak Intersectoral Coordination	“Coordination exists but there is no formal agreement or routine meetings.” (Village Official)	No formal coordination structures were observed at the institutional level.
Parental Participation Constraints	“Parents want to be involved but time and work commitments are barriers.” (Parent)	Parental attendance varied and declined in non-mandatory activities.

The implementation of Holistic Integrative Early Childhood Education is supported by strong educator commitment, the availability of basic policy guidelines, and proactive integration of health, hygiene, and nutrition practices into daily learning, along with periodic support from health services for growth monitoring. However, its effectiveness is constrained by limited human resources, overlapping educator responsibilities, weak intersectoral coordination, the absence of formal collaboration mechanisms, and varying levels of parental participation. These findings highlight the need to strengthen institutional capacity, formalize coordination, and enhance parental engagement to improve sustainable stunting prevention.

*Discussion*

*Implementation of Holistic Integrative Early Childhood Education Services*

The findings of this study indicate that educational services constitute the most consistently implemented component of Holistic Integrative Early Childhood Education, particularly through the integration of clean and healthy living behaviors and health-related messages into daily learning activities. This result aligns with the concept of nutrition-sensitive interventions, which emphasizes the role of education and behavioral habituation in supporting child growth and development (Vaivada et al., 2020; Zahrah et al., 2025). Early childhood education units are strategically positioned to promote health literacy, positive caregiving practices, and developmental stimulation, which are essential for preventing stunting during the critical early years (Britto et al., 2017; Jeong et al., 2021). The strong role of teachers observed in this study reflects previous findings that educator commitment and routine educational practices are key entry points

for implementing holistic services in early childhood settings (Siraj et al., 2022).

The study also reveals significant gaps in the implementation of health, nutrition, caregiving, and child protection services, which remain largely dependent on external factors such as health centers and village programs. This condition supports recent research showing that holistic integrative approaches often face operational challenges due to weak institutional coordination and limited-service delivery capacity (Agustiani et al., 2025; Saleh et al., 2024). Evidence from cross-sectoral evaluations of stunting prevention programs demonstrates that while multisector collaboration can improve service integration, coordination mechanisms are often underdeveloped and require strengthening (Putri Kinayungan et al., 2024; Putri et al., 2024). Scoping evidence on daycare nutrition programs indicates that integrated approaches involving healthcare, education, and community engagement have greater potential to reduce stunting than isolated interventions (Zahrah et al., 2025). From a policy implementation perspective, successful translation of holistic integrative approaches requires clear operational guidelines, adequate resources, and strong intersectoral collaboration to systematically embed integrated services into routine ECE practices.

*Cross Sectoral Coordination and Collaboration*

The findings of this study show that cross-sectoral coordination in the implementation of Holistic Integrative Early Childhood Education remains limited and largely informal, with collaboration between early childhood education units, health services, and village governments occurring mainly during specific programs such as immunization, growth monitoring, and stunting campaigns. This pattern reflects common challenges in multisectoral approaches to child

development, where coordination is often event-based rather than institutionalized (Oktofani et al., 2025; Rusdi et al., 2024). Absence of formal coordination mechanisms, such as joint planning, regular meetings, and written agreements, constrains the effectiveness of integrated service delivery and reduces the capacity of ECE units to function as convergence points for stunting prevention.

From a theoretical perspective, multisectoral convergence requires clear role delineation, shared accountability, and sustained intersectoral communication to ensure that interventions reinforce one another (Putri Kinayungan et al., 2024; Vaivada et al., 2020). The findings indicate that coordination is highly dependent on external programs and funding cycles, which undermines long-term institutional commitment and program sustainability. Similar findings have been reported in recent studies showing that weak governance structures and fragmented service delivery limit the impact of integrated early childhood interventions (Jeong et al., 2021; Siraj et al., 2022). Strengthening formal coordination structures and embedding collaboration within routine ECE practices are therefore essential to improving the effectiveness of Holistic Integrative Early Childhood Education as a multisectoral strategy for stunting prevention.

#### *Parental and Community Involvement*

The findings of this study are consistent with previous research indicating that parental involvement in early childhood education and stunting prevention tends to be uneven and strongly influenced by socio-economic constraints and parental awareness. Recent studies in early childhood engagement have found that while parents are key actors in supporting learning and developmental activities, their participation is often limited, with involvement concentrated in specific events rather than continuous home practices, particularly in low-resource settings (Akkari, 2025; Oliveira, 2023). These studies highlight that low socio-economic status, limited educational attainment, and time constraints are major barriers to sustained parental participation.

Research on policy and practice also shows that inadequate parental engagement weakens the continuity of early childhood interventions, reinforcing this study's finding that parental involvement is largely activity-based rather than continuous (Akkari, 2025). In comparison with earlier work, this research confirms that community involvement remains predominantly program driven and health centered, with local organizations and community actors often participating only during specific health or nutrition campaigns rather than integrated educational activities. This

underscores the conclusion that stronger parental empowerment strategies and institutionalized community partnerships are essential for sustainable stunting prevention efforts.

#### *Supporting and Inhibiting Factors*

The findings of this study indicate that the implementation of Holistic Integrative Early Childhood Education (HIECE) is strongly influenced by the commitment of educators, the availability of operational policy guidelines, and the integration of health, hygiene, and nutrition-related practices into daily learning activities. Educators play a central role in implementing holistic early childhood programs, particularly in promoting nutrition-sensitive and developmentally appropriate practices (Siraj et al., 2022; Vaivada et al., 2020). Collaboration with health services further supports program implementation, as partnerships with health workers strengthen early detection of growth problems and reinforce preventive health behaviors in early childhood settings (Putri et al., 2024; Zahrah et al., 2025). Evidence from Indonesian contexts shows that incorporating local nutrition sources into early childhood programs enhances dietary diversity and supports stunting prevention (Kristianingrum et al., 2023). Systematic evaluations of stunting prevention programs in Indonesia further highlight that program effectiveness depends on both community engagement and multisectoral coordination (Fristiwi et al., 2023).

Parental involvement in HIECE is uneven and strongly influenced by socio-economic constraints and parental awareness. While parents are critical actors in supporting early childhood development and nutrition-sensitive interventions, their engagement is often limited to specific activities and does not consistently translate into continuous caregiving practices at home (Oktofani et al., 2025; Rusdi et al., 2024). Low parental education, limited time, and economic pressures are key barriers to sustained participation, weakening the continuity of early childhood interventions (Putri Kinayungan et al., 2024; Vaivada et al., 2020).

Cross-sectoral coordination remains largely informal, occurring mainly during specific programs such as immunization, growth monitoring, and stunting campaigns. The absence of formal mechanisms such as joint planning, regular meetings, and written agreements constrains the effectiveness of integrated service delivery and reduces the capacity of ECE units to function as convergence points for stunting prevention (Agustiani et al., 2025; Saleh et al., 2024). Multisectoral convergence requires clear role delineation, shared accountability, and sustained intersectoral communication to ensure interventions reinforce one another (Putri et al., 2024; Zahrah et al.,

2025). Fragmented governance structures, reliance on external programs, and inconsistent parental and community engagement further limit the long-term sustainability of integrated early childhood and nutrition interventions (Fristiwi et al., 2023; Siraj et al., 2022). Strengthening formal coordination structures, embedding collaboration within routine ECE practices, and empowering parents and communities are therefore essential strategies to enhance the effectiveness of HIECE as a multisectoral approach to stunting prevention.

## Conclusion

The implementation of the Holistic Integrative Early Childhood Education (HI-ECE) program in preventing stunting in Aceh Tamiang Regency has been carried out but has not yet reached an optimal level. Educational services are the most consistently implemented component, particularly through the integration of health, hygiene, and nutrition-related practices into daily learning activities. However, other components such as health services, nutrition services, caregiving support, and child protection are still limited and largely dependent on external programs from health institutions and village initiatives. In addition, the effectiveness of the program is constrained by weak cross-sectoral coordination, limited human resources, and inconsistent parental participation. These findings indicate that strengthening institutional capacity, establishing formal coordination mechanisms among stakeholders, and enhancing parental and community engagement are essential to optimize early childhood education institutions as convergence points for sustainable stunting prevention efforts.

## Acknowledgment

The authors would like to express their gratitude to the early childhood education institutions, educators, health workers, village officials, and parents in Aceh Tamiang Regency who participated in this study and provided valuable information during the data collection process. The authors also thank Universitas Negeri Semarang for supporting the implementation of this research. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

## Author Contributions

Conceptualization, U.R.P., D., and A.F.; methodology, U.R.P.; validation, D. and A.F.; formal analysis, U.R.P.; investigation, U.R.P.; resources, D. and A.F.; data curation, U.R.P.; writing original draft preparation, U.R.P.; writing review and editing, D. and A.F.; visualization, U.R.P. All authors have read and agreed to the published version of the manuscript.

## Funding

This research received no external funding

## Conflicts of Interest

The authors declare no conflict of interest

## References

- Agustiani, Y., Suryadi, & Domai, T. (2025). Cross-Sector Coordination in Accelerating Stunting Reduction: A Case Study of Policy Implementation in Pahandut District, Palangkaraya City. *Jurnal Bina Praja*. <https://doi.org/10.21787/jbp.17.2025-2694>
- Akkari. (2025). Exploring parental involvement in early childhood education in Sub-Saharan Africa: A systematic review. *Social Sciences & Humanities Open*. <https://doi.org/10.1016/j.ssaho.2025.101367>
- Bhutta, Z. A., Das, J. K., Rizvi, A., Gaffey, M. F., Walker, N., Horton, S., Webb, P., Lartey, A., & Black, R. E. (2020). Actions to address child stunting in low- and middle-income countries: A review of evidence and program implications. *The Lancet Global Health*, 8(2), e152--e160. [https://doi.org/10.1016/S2214-109X\(19\)30418-7](https://doi.org/10.1016/S2214-109X(19)30418-7)
- Black, M. M., Walker, S. P., Fernald, L. C. H., Andersen, C. T., DiGirolamo, A. M., Lu, C., McCoy, D. C., Fink, G., Shawar, Y. R., Shiffman, J., & others. (2017). Early childhood development coming of age: Science through the life course. *The Lancet*, 389(10064), 77–90. [https://doi.org/10.1016/S0140-6736\(16\)31389-7](https://doi.org/10.1016/S0140-6736(16)31389-7)
- Britto, P. R., Lye, S. J., Proulx, K., Yousafzai, A. K., Matthews, S. G., Vaivada, T., Perez-Escamilla, R., Rao, N., Ip, P., Fernald, L. C., & others. (2017). Nurturing care: Promoting early childhood development. *The Lancet*, 389(10064), 91–102. [https://doi.org/10.1016/S0140-6736\(16\)31390-3](https://doi.org/10.1016/S0140-6736(16)31390-3)
- Bruening, M., Nadalet, C., Ashok, N., Suh, B. C., & Lee, R. E. (2022). Preschoolers' parent and teacher perceptions of returning to early childcare education during the COVID-19 pandemic. *BMC Public Health*, 22, 2270. <https://doi.org/10.1186/s12889-022-14409-w>
- Emerson, K., & Nabatchi, T. (2018). *Collaborative Governance Regimes*. Georgetown University Press.
- Fristiwi, P., Nugraheni, S. A., & Kartini, A. (2023). The Effectiveness of Stunting Prevention Programs in Indonesia: A Systematic Review. *Jurnal Penelitian Pendidikan IPA*, 9(12), 1262–1273. <https://doi.org/10.29303/jppipa.v9i12.5850>
- Hoddinott, J., Headey, D., & Dereje, M. (2021). Nutrition and health interventions for reducing stunting: Evidence from integrated development programs. *World Development*, 146, 105559. <https://doi.org/10.1016/j.worlddev.2021.105559>

- Jeong, J., Franchett, E. E., de Oliveira, C. V., Rehmani, K., & Yousafzai, A. K. (2021). Parenting interventions to promote early child development in the first three years of life: A global systematic review and meta-analysis. *PLOS Medicine*, 18(5), e1003602. <https://doi.org/10.1371/journal.pmed.1003602>
- Kinayungan, U. P., Hasanbasri, M., & Padmawati, R. S. (2022). Cross-Sectoral Support in Stunting Prevention Through Integrated Health Posts (Posyandu) in Yogyakarta City. *Al GIZZAI: Public Health Nutrition Journal*. <https://doi.org/10.24252/algizzai.v4i2.48201>
- Kristianingrum, D. Y., Barir, B., Shofiyah, S., Yosin, E. P., & Sandi, D. F. (2023). Strengthening Nutrition Sources Based on Local Food as an Effort to Prevent Stunting. *Jurnal Penelitian Pendidikan IPA*, 9(SpecialIssue), 692-697. <https://doi.org/10.29303/jppipa.v9iSpecialIssue.6401>
- Kulaksız, T., & Toran, M. (2022). Development of pre-service early childhood teachers' technology integration skills through a praxeological approach. *International Journal of Educational Technology in Higher Education*, 19(36). <https://doi.org/10.1186/s41239-022-00344-8>
- Lestari, E., Siregar, A., Hidayat, A. K., & Yusuf, A. A. (2024). Stunting and its association with education and cognitive outcomes in adulthood: A longitudinal study in Indonesia. *PLOS ONE*, 19(5), e0295380. <https://doi.org/10.1371/journal.pone.0295380>
- Levickis, P., Murray, L., Lee-Pang, L., Eadie, P., & Page, J. (2022). Parents' Perspectives of Family Engagement with Early Childhood Education and Care During the COVID-19 Pandemic. *Early Childhood Education Journal*. <https://doi.org/10.1007/s10643-022-01376-5>
- Neuman, M. J., & Devercelli, A. E. (2019). *Developing Early Childhood Education Systems for the Future*. World Bank.
- Oktofani, R., Kartikaningsih, H., & Badriyah, N. (2025). The Correlation between Environmental Sanitation and Stunting Management through Women's Interventions and Food Security in Pre-School Age Children. *Jurnal Penelitian Pendidikan IPA*, 11(1), 462-473. <https://doi.org/10.29303/jppipa.v11i1.8265>
- Oliveira. (2023). Assessing the Role of Parental Involvement Policies in Improving Early Childhood Education Outcomes in Indonesia. *International Journal of Educational Evaluation and Policy Analysis*. <https://doi.org/10.62951/ijeepa.v1i2.71>
- Prendergast, A. J., & Humphrey, J. H. (2019). The stunting syndrome in developing countries. *Paediatrics and International Child Health*, 39(3), 163-175. <https://doi.org/10.1080/20469047.2019.1609820>
- Putri Kinayungan, U., Hasanbasri, M., & Padmawati, R. S. (2024). Cross-Sectoral Support in Stunting Prevention Through Integrated Health Posts (Posyandu) in Yogyakarta City. *Al GIZZAI: Public Health Nutrition Journal*, 4(2), 80-94. <https://doi.org/10.24252/algizzai.v4i2.48201>
- Putri, N. K., Wardhani, L. P., & Ernawaty. (2024). Positive deviance/hearth intervention in collaboration between academia and NGOs: a realist evaluation. *BMC Public Health*, 24, 3598. <https://doi.org/10.1186/s12889-024-20632-4>
- Richter, L. M., Daelmans, B., Lombardi, J., Heymann, J., Boo, F. L., Behrman, J. R., Lu, C., Lucas, J. E., Perez-Escamilla, R., Dua, T., & Bhutta, Z. A. (2017). Investing in the foundation of sustainable development: Pathways to scale up for early childhood development. *The Lancet*, 389(10064), 103-118. [https://doi.org/10.1016/S0140-6736\(16\)31698-1](https://doi.org/10.1016/S0140-6736(16)31698-1)
- Rusdi, D., Syah, N., & Yuniarti, E. (2024). The Relationship Between Maternal Education Level and Stunting: Literature Review. *Jurnal Penelitian Pendidikan IPA (JPPIPA)*, 10(10), 704-710. <https://doi.org/10.29303/jppipa.v10i10.9495>
- Saleh, N. F., Balqis, Darmawansyah, Razak, A., & Syafar, M. (2024). Implementation of Convergence (Cross-Sectoral) Action for the Acceleration of Stunting Reduction in Palopo City, South Sulawesi, Indonesia. *South Eastern European Journal of Public Health*. <https://doi.org/10.70135/seejph.vi.2189>
- Sideropoulos, V., Draper, A., Munoz-Chereau, B., Ang, L., & Dockrell, J. E. (2025). Childhood stunting and cognitive development: A meta-analysis. *Journal of Global Health*, 15, 4257. <https://doi.org/10.7189/jogh.15.04257>
- Siraj, I., Melhuish, E., Howard, S. J., & Neilsen-Hewett, C. (2022). Improving quality of teaching and child development: A randomised controlled trial of the leadership for learning intervention in preschools. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.1092284>
- Sørensen, E., & Torfing, J. (2018). *Interactive Governance: Advancing the Paradigm*. Oxford University Press.
- Suryawan, A., Jalaludin, M. Y., Poh, B. K., Sanusi, R., Tan, V. M. H., Geurts, J. M., & Muhardi, L. (2022). Malnutrition in early life and its neurodevelopmental and cognitive consequences: A scoping review. *Nutrition Research Reviews*, 35(1), 136-149. <https://doi.org/10.1017/S0954422421000159>

- UNESCO. (2022). *Right to Pre-primary Education: A Global Study*. UNESCO Publishing.
- UNICEF. (2023). *Early Childhood Development and Education Strategy 2023–2030*. United Nations Children's Fund.
- Vaivada, T., Gaffey, M. F., Das, J. K., & Bhutta, Z. A. (2020). Improving early child development: A systematic review and meta-analysis of early childhood development programs. *PLOS Medicine*, 17(12), e1003432. <https://doi.org/10.1371/journal.pmed.1003432>
- Wijeakumar, S., Forbes, S. H., Magnotta, V. A., Deoni, S., Jackson, K., Singh, V. P., Tiwari, M., Kumar, A., & Spencer, J. P. (2023). Stunting in infancy is associated with atypical activation of working memory and attention networks. *Nature Human Behaviour*, 7(12), 2199–2211. <https://doi.org/10.1038/s41562-023-01725-3>
- World Health Organization, UNICEF, & World Bank Group. (2018). *Nurturing Care for Early Childhood Development: A Framework for Helping Children Survive and Thrive to Transform Health and Human Potential*. World Health Organization.
- Zahrah, N. A. A., Suryawati, C., & Kartini, A. (2025). Nutrition Program in Daycare Services to Combat Stunting in Toddlers: A Scoping Review. *Jurnal Ners*, 10(1), 772–780. <https://doi.org/10.31004/jn.v10i1.53178>