MEDALION JOURNAL: Medical Research, Nursing, Health and Midwife Participation | ISSN(e): 2986-7754
Volume 7 No 2 (2026)

EVALUATION OF THE IMPLEMENTATION OF THE ISPA CONTROL PROGRAM IN THE MANAGEMENT OF TODDLER PNEUMONIA AT THE PUTRI AYU PUBLIC HEALTH CENTER IN JAMBI CITY

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Received	: 22-05-2026	Published	: 31-05-2026
Revised	: 23-05-2026	DOI	: https://doi.org/10.59733/medalion.v7i2.300
Accepted	: 31-05-2026	Publish Link	:https://medalionjournal.com/index.php/go

Abstract
Acute respiratory infections including pneumonia remain a major cause of morbidity and mortality in children under five and case detection in primary care is often low despite the availability of guidelines; Putri Ayu Community Health Center recorded 53 cases of pneumonia in children under five in 2025 with a detection coverage of 26.49% of the target of 90%, so an implementation evaluation is needed. Objective: To evaluate the implementation of the ARI Control Program in the management of pneumonia in children under five using a logic model (input → activity → output). Method: Descriptive qualitative case study at Putri Ayu Community Health Center (Dec 2024–Apr 2026) with snowball sampling (n=9 informants: manager, clinician, pharmacist, emergency department, nutritionist, and caregiver); data collection through in-depth interviews, participant observation, and document review; thematic analysis using NVivo 12 and the Miles-Huberman framework with triangulation. Results: Input was partially adequate but training was uneven and there was a shortage of nurses during peak periods; some drugs, injection preparations, forms, and ARI sound timers were unavailable or damaged; Funding is relatively sufficient but early year disbursement is hampered; SOPs exist but require cluster adjustments; program activities are inconsistent (dominant passive findings, uneven breath counts, variable antibiotic duration, pre-referral is not yet uniform, use of KIA Handbooks is lacking, monitoring does not comply with guidelines); output is low (26.49%). Conclusion: Implementation is partially in accordance with the 2018 FKTP guidelines but is not yet consistent; it is recommended to strengthen active surveillance and reporting networks, standardize clinical references, uniform training for supporting units, improve logistics and critical equipment, and improve communication and monitoring to improve case detection and management compliance.

Keywords: Case Coverage, ISPA Control, Pneumonia Management, Primary Health Care, Toddler Health

INTRODUCTION

Acute respiratory infections (ARI), including pneumonia, remain a major cause of morbidity and mortality in many countries, particularly among children under five. Pandemic trends and fluctuations in ARI incidence in recent years confirm that the burden of this disease remains high despite the availability of preventive and therapeutic interventions (World Health Organization, 2021; Nair *et al*., 2022). Globally, pneumonia continues to be a leading cause of death in children under five years of age and also significantly impacts demand for primary health care, necessitating the strengthening of early detection capacity, standardized management, and evidence-based prevention strategies (WHO, 2021; Liu *et al*., 2023). (WHO, 2021; Nair *et al*., 2022).

In Indonesia, acute respiratory infections (ARI) play a significant role in primary care visit patterns, with prevalence and visit rates varying across regions and susceptible to sociodemographic, environmental, and local health care system factors (Ministry of Health, 2024; Siregar *et al*., 2023). Recent ministry survey

data and regional studies indicate a persistently high prevalence of ARI and pneumonia cases among children under five—a significant impact on the burden on community health centers (Puskesmas) and the need to increase case detection and reporting capacity at the primary care level (Ministry of Health, 2024; Prasetyo *et al*., 2022) (Ministry of Health, 2024; Prasetyo *et al*., 2022). Primary health care is the cornerstone of Indonesia's preventive health system, which is delivered through a network of Community Health Centers (Puskesmas) (kadek primadewi, *et al*.,2025)

Recent empirical studies and systematic reviews highlight that successful pneumonia control in primary care relies on several key components: the availability and competence of healthcare workers, adherence to management guidelines (including respiratory rate counting and danger sign assessment), integration of referral networks, and reliable recording and reporting systems (Smith *et al*., 2021; Rahman & Yusuf, 2023). Several studies have shown that although community health centers (Puskesmas) report administrative adherence to standard procedures, the effectiveness of pneumonia detection in the field is often hampered by gaps in practical training, limited facilities, and suboptimal surveillance mechanisms (Khodijah *et al*., 2020; Ardhiah *et al*., 2024). (Smith *et al*., 2021; Rahman & Yusuf, 2023).

Comparison of findings across studies reveals inconsistencies: some program evaluations report high procedural compliance but low pneumonia case detection, while others attribute low detection to external factors such as community network participation and family service-seeking behavior (Deswita *et al*., 2024; Khodijah *et al*., 2020). Methodological limitations of previous studies include the use of administrative data without field verification, non-representative study coverage at the community health center level, and a lack of analysis that integrates inputs (resources), processes (program activities), and outputs into a program evaluation logic model (Lee *et al*., 2022; Deswita *et al*., 2024). (Deswita *et al*., 2024; Lee *et al*., 2022)

A significant gap exists between the high number of ISPA visits and the low proportion of reported pneumonia cases in children under five; the case of Putri Ayu Community Health Center—with its fluctuating trend of ISPA visits and pneumonia detection rate of only 26.49% against the 90% target by 2025—illustrates this issue and raises questions about the validity of reported administrative outcomes of standard management (Jambi City Health Office, 2025; Sitanggang & Kalsum, 2024). The lack of research that combines a holistic analysis of inputs, program activities, and outputs in the context of densely populated urban community health centers highlights a research gap that needs to be filled to understand the root causes of low pneumonia detection despite reports of seemingly adequate standard management (Jambi City Health Office, 2025; Sitanggang & Kalsum, 2024).

Therefore, this study aims to evaluate the implementation of the ARI Control Program, specifically the management of pneumonia in children under five, at the Putri Ayu Community Health Center in Jambi City, using a logic model (input → program activities → output) to identify implementation barriers and inconsistencies between administrative reports and field practices. This study is important because it provides empirical evidence that combines routine service data with field verification and process analysis, thus offering theoretical contributions to primary health program evaluation and practical contributions for local policymakers to improve case finding, human resource capacity, and reporting systems (WHO, 2021; Deswita *et al*., 2024). The novelty of this study lies in its comprehensive and contextual evaluative approach to urban community health centers in Indonesia, which links input aspects, program activities, and outputs to explain the gap between the burden of ARI and the low detection of pneumonia in children under five (WHO, 2021; Deswita *et al*., 2024).

METHOD

This research is a descriptive qualitative study using a case study approach that aims to understand in depth the implementation of the ARI Control Program, specifically the management of pneumonia in toddlers at the Putri Ayu Community Health Center, Jambi City. The qualitative approach was chosen because the focus of the research is the meaning, experience, clinical practice, and organizational dynamics that are not easily measured quantitatively; therefore, this method emphasizes contextual understanding through in-depth interviews, participant observation, and document review (Creswell, 2014; Sugiyono, 2017). Case studies allow for intensive analysis of complex phenomena within specific location boundaries, thus revealing the program implementation process, operational obstacles, and discrepancies between administrative reports and field practices (Stake, 1995; Yin, 2018). Primary and secondary data complement each other to produce a rich and valid picture of the context of primary care at the Putri Ayu Community Health Center, including trends in ARI visits to toddlers and pneumonia detection achievements in 2022–2025, which serve as the empirical background of the study.

The study was conducted at the Putri Ayu Community Health Center, Jambi City, from December 2024 to April 2026; this period was chosen to allow for longitudinal data collection on ISPA visit patterns and verification of service records over the past few years. The study population included all key actors involved in the implementation of the ISPA program in the community health center's work area, including health workers (the head of the community health center, the head of administration, the person in charge of the MTBS program, the person in charge of the ISPA P2 program, doctors, pharmacists, emergency room staff, nutritionists) and families of toddlers diagnosed with pneumonia. The informant sample was determined using an initial purposive sampling technique followed by snowball sampling to capture additional relevant informants until data saturation was reached. A total of nine informants were processed, consisting of one key informant (the Head of the Community Health Center), four primary informants (the head of administration, the MTBS PJ, the PJ of the ISPA P2 Program, doctors), and four supporting informants (pharmacy, emergency room staff, nutritionists, and mothers of toddler pneumonia patients). This sampling strategy aligns with the qualitative principle of selecting participants who are best able to provide rich information about the phenomenon being studied (Emzir, 2012; Miles, Huberman & Saldaña, 2019).

In the qualitative research tradition, the researcher acts as the primary instrument for data collection, requiring sensitivity, reflective skills, and consistency in recording and methodological decision-making during fieldwork (Sugiyono, 2017; Creswell, 2014). Furthermore, supporting instruments included a semi-structured interview guide for in-depth interviews, an integrated observation sheet for recording patient management practices and service flows, and a document review format for reviewing medical records, monthly ISPA reports, and pneumonia management logbooks at the Community Health Center. All interviews were recorded using a voice recorder (HP) after obtaining the informant's consent, then transcribed verbatim for analysis. These steps adhered to the principles of validity and reliability of qualitative data as recommended in the methods literature (Emzir, 2012; Miles & Huberman, 1994).

Primary data collection was conducted through in-depth semi-structured interviews with key informants, confirmatory interviews with supporting informants, participant observation of the emergency room/IMCI service flow, and document review including community health center reports, data on ISPA visits to toddlers, and guidelines for pneumonia management at primary health care facilities (FKTP). Interviews were directed at exploring input aspects (human resources, facilities, policies, funding), program processes or activities (assessment of children with cough, classification, diagnosis, treatment, referral,

counseling, monitoring), and outputs (scope of pneumonia detection and compliance with guidelines), following the program logic framework that served as the basis for the study. Secondary data were obtained from official documents from the Jambi City Health Office, internal reports from the Putri Ayu Community Health Center, and relevant national technical guidelines to provide sample context and verify field findings (Ministry of Health of the Republic of Indonesia, 2018; ISPA P2 Guidelines, Directorate General of P2PL, 2011).

Data analysis was conducted iteratively and thematically using the Miles and Huberman model, which focuses on four interactive activities: data collection, data reduction, data presentation, and conclusion drawing/verification. Interview transcripts, observation notes, and documents were analyzed using NVivo 12 software to assist in coding, grouping themes, and visualizing relationships between codes related to input, program activities, and output categories. The analysis process began with data familiarization, followed by data reduction through sorting relevant data pieces, open coding, and axial coding to build categories, and finally, the development of interrelated themes until saturation was achieved. Thematic results are presented in the form of analytical narratives complete with supporting quotes from informants, comparison matrices, and thematic maps to facilitate readers' understanding of the dynamics of program implementation (Miles, Huberman & Saldaña, 2019; Saldaña, 2021).

To ensure the validity of the findings, a triangulation strategy of sources and methods was used, namely comparing information between informants and comparing data from interviews, observations, and official documents. Cross-verification was conducted with administrative data from the Jambi City Health Office (2022–2025) and community health center reports to detect inconsistencies between administrative reports and field practices. Other techniques used included member checking with several key informants to validate interpretations, an audit trail of research process documentation, and internal peer debriefing to reduce researcher bias. This approach follows recommendations in the modern qualitative methods literature to increase the credibility and transferability of findings (Lincoln & Guba, 1985; Miles & Huberman, 1994).

This research was conducted in accordance with research ethics standards: obtaining ethical approval from supporting institutions where necessary, obtaining written informed consent from all informants, maintaining anonymity and confidentiality of data (use of codes/initials in transcripts and reports), and ensuring the principle of beneficence by minimizing risks to participants and providing information on the practical benefits of the research results to the Community Health Center and the Jambi City Health Office. All data recording and storage processes followed data security protocols so that only the principal investigator and authorized team had access to the raw data.

The research stages began with preparation (research permit, identification of initial informants, preparation of interview guidelines), field data collection (in-depth interviews, observations, document reviews) until the period of December 2024–April 2026, followed by the process of data transcription and coding using NVivo 12, thematic analysis based on the Miles and Huberman model, validation of findings through triangulation and member checking, and preparation of a final report containing findings, interpretations, and policy recommendations. This systematic approach is intended to produce an analysis that is scientifically accountable and relevant to improving the implementation of the ARI Control Program at the community health center level.

RESULTS AND DISCUSSION

Informant Characteristics

Table 1. Informant Characteristics

No.	Informant Code	Gender	Age	Position	Type of Informant
1.	R56	Woman	56	Head of Putri Ayu Community Health Center	Key Informant
2.	PJ52	Woman	52	Head of Administration	Key Informant
3.	ER48	Woman	48	MTBS Person in Charge	Key Informant
4.	EV56	Woman	56	Person in Charge of ISPA P2 Program	Key Informant
5.	G35	Woman	35	Doctor	Key Informant
6.	E35	Woman	35	Pharmacist	Supporting Informant
7.	D46	Woman	46	Emergency room staff	Supporting Informant
8.	N35	Woman	35	Nutritional Power	Supporting Informant
9.	R35	Woman	35	Mother of Toddler	Supporting Informant

Input

1. Human Resources (HR)
   a. Availability of human resources

      Based on in-depth interviews, the personnel involved in managing toddler pneumonia at Putri Ayu Community Health Center come from several service units. Services in the pediatric/MTBS clinic involve doctors and nurses, particularly those in charge of MTBS and those in charge of P2 ISPA. In addition, services are also supported byPharmacy, emergency room, and nutrition staff are available as needed by patients. Most informants stated that the available staff is sufficient for routine services, but noted that the pediatric clinic can feel understaffed during peak patient visits.

   b. Training

      Based on interviews, training related to infant pneumonia has not been implemented evenly among all staff involved. Some staff have received IMCI training or training related to infant illnesses, but specific training for infant pneumonia is not routine and has not reached all supporting units such as the pharmacy, emergency department, and nutrition.

   c. Constraint

      Human resource constraints in implementing pneumonia management for toddlers were not always identified as a major obstacle by all informants. Some reported no significant obstacles because services continued to operate. However, implementing informants noted a shortage of nurses during peak patient visits and uneven distribution of specialized training for pneumonia in toddlers.

2. Facilities and infrastructure
   a. Availability

Table 2. Facilities and Infrastructure

No	Infrastructure	There is	No	Quantity/availability	information
Medication (Oral Preparation)					
1.	Amoxicillin	✓		Enough	Pharmacy
2.	Erythromycin	✓		Enough	Pharmacy
3.	Ampicillin		✓	Empty	
4.	Paracetamol	✓		Enough	Pharmacy
5.	Bronchodilators:				Pharmacy
	• Nebulized salbutamol,	✓		Enough	
	• Salbutamol with MDI (metered dose inhaler) spacer,		✓	Empty	
	• Subcutaneous epinephrine (adrenaline)	✓		Enough	

	• Salbutamol tablets 2 and 4 mg	✓		Enough	
Drugs (Injection Preparations)					
1.	Ampicillin injection		✓	Empty	
2.	Gentamicin injection		✓	Empty	
3.	Aqua bides for solvent	✓		10 Pial	Emergency Room
4.	Disposable Syringe	✓		1 Box	Emergency Room
5.	70% alcohol	✓		3	Emergency Room
Tool					
1.	Oxygen concentrator and nasal tube/nasalprog	✓		3	Emergency Room
2.	ARI Sound Timer	✓		1	Children's Clinic
3.	Pulse Oximeter	✓		2	Children's Clinic
4.	Scales, Meters, and Thermometers	✓		1	Children's Clinic
5.	Nebulizer	✓		2	Emergency Room
6.	Register book stamp and P2 ISPA Program Reporting Form	✓		Available	Children's Clinic
7.	KIA Book		✓	Not available	
8.	Careseeking Recapitulation Form for P2 ISPA Program		✓	Not available	
9.	Home visit form for toddler pneumonia sufferers within the framework of the P2 ISPA careseeking program		✓	Not available	

Observation results indicate the availability of basic infrastructure for the management of pneumonia in children, such as service rooms, antibiotics, injection preparations, oxygen concentrators with nasal tubes, ARI sound timers, pulse oximeters, scales, meters, thermometers, nebulizers, register book stamps, and reporting forms for the P2 ISPA program. However, several items are still not available, including oral ampicillin, salbutamol with MDI spacer, ampicillin injections, gentamicin injections, KIA books, and home visit forms for pneumonia sufferers in children for the P2 ISPA program careseeking. Overall, basic facilities are available but not yet complete according to guidelines, with differences between informant responses and observations emphasizing the need for regular checks to ensure that tools and forms are truly ready for use when needed.

b. Function

Besides availability, the functionality of facilities and infrastructure is also crucial in managing childhood pneumonia. Most informants reported that the available equipment was still usable and supported services. However, one consistent obstacle was the broken ARI sound timer.

c. Constraint

Most informants reported no major challenges related to facilities and infrastructure. The most common issue was a broken breathalyzer, while other equipment and medications were deemed sufficient for daily services.

3. Funds

a. Availability

Based on interviews, funding for the management of childhood pneumonia comes from several sources, primarily the Public Service Agency (BLUD) and the Public Service Agency (BOK). Most medications are obtained from the Health Office, while equipment and field activities can be funded through community health center budget mechanisms, in accordance with established procedures.

b. Allocation

The allocation of funds for the management of pneumonia in toddlers is used for the needs of medical equipment, medicines, field activities, transportation for officers, family support, and nutrition-related activities if necessary.

c. Constraint

The main obstacle in the funding aspect is not the lack of funds, but the delay in disbursement, especially at the beginning of the year when the health center is still waiting for administrative documents such as decrees, specimens, RBA, or DPA from the Health Office.

4. Policy
   a. Reference

      Based on interviews and document review, Putri Ayu Community Health Center has references in the form of SOPs, PPK (Community Health Assessment), Ministry of Health guidelines, and guidelines for managing pneumonia in toddlers. Several informants mentioned using the MTBS guidelines and WHO guidelines for assessing and classifying pneumonia in toddlers.

   b. Effectiveness

      The effectiveness of policies for managing pneumonia in children is influenced by the implementation of standard operating procedures (SOPs), the availability of guidebooks, budget support, and parental compliance with staff recommendations. Informants assessed that SOPs help staff work more effectively, but service effectiveness depends not only on staff but also on the patient's family.

   c. Constraint

      Most informants stated there were no major obstacles in implementing the policy. However, interviews revealed several issues, including limited human resources during peak service times, potential differences of opinion regarding medication dosage, and family compliance that was not always as recommended.

Program Activities

1. Case Finding
   a. Implementation

      Based on interviews, case detection of pneumonia in toddlers at the Putri Ayu Community Health Center is carried out both passively and actively. Passive detection is carried out through patient visits to the community health center, particularly to the pediatric clinic. Active detection is carried out through integrated health service posts (Posyandu), where cadres or staff can advise parents to bring children experiencing coughing, shortness of breath, or other symptoms to the community health center.

   b. Partnerships and networking

      Putri Ayu Community Health Center has a network with independent midwives, practicing doctors, clinics, community health centers (Pustu), hospitals, and other sectors. However, this collaboration has not yet been specifically implemented for reporting pneumonia cases in toddlers. The network is more used for general reporting or cross-program coordination.

   c. Constraint

      Obstacles to case detection are primarily related to family behavior, low reporting from other facilities, and the inactivity of cadres in official reporting. Some parents still consider coughs or shortness of breath to be common complaints, choosing to buy medication at a shop, pharmacy, or see a midwife first.

2. Assess a child for coughing and/or difficulty breathing

a. Implementation

Assessment of children with coughs and/or difficulty breathing is performed through the pediatric polyclinic/IMCI service flow. Staff will conduct a history, weigh the child, measure the child's temperature, assess for cough or shortness of breath, count the respiratory rate, observe chest wall indrawing, listen to breath sounds with a stethoscope, and check oxygen saturation if necessary.

b. Constraint

There were few challenges in assessing children with coughs and/or difficulty breathing. The main challenge was fussiness or crying, which made the examination, particularly auscultation and oxygen saturation measurement, difficult.

3. Classification of Pneumonia in Toddlers

a. Implementation

Classification of pneumonia in toddlers is based on clinical assessment. Staff use the IMCI format, standard operating procedures (SOPs), and guidelines that differentiate between coughs that are not pneumonia, pneumonia, and severe pneumonia. In practice, physicians play a crucial role in determining patient classification and follow-up.

b. Constraint

Based on interviews, no significant obstacles were found in the process of classifying pneumonia in toddlers. Officers stated that the available examination tools and guidelines were quite helpful in classifying cases.

4. Pneumonia Diagnosis

a. Implementation

A doctor makes a diagnosis of pneumonia based on a history, physical examination, and necessary supporting tests. These tests include assessing symptoms, duration of cough or shortness of breath, respiratory rate, chest indrawing, auscultation, oxygen saturation, and, in certain cases, laboratory tests such as leukocyte counts.

b. Constraint

Diagnostic challenges are similar to those encountered during the assessment phase: a child who is fussy, crying, or uncooperative during the examination. These conditions can interfere with the accuracy of saturation measurements and auscultation, requiring the provider to wait for the child to calm down.

5. Treatment and referral

a. Implementation of Treatment

Treatment for toddler pneumonia at Putri Ayu Community Health Center is based on the patient's clinical condition. In cases that can be treated at the community health center, doctors prescribe antibiotics, symptomatic medications such as paracetamol, cough and cold medications, and other therapies as needed. If the child is experiencing shortness of breath, nebulization or oxygen therapy can be performed in the emergency room before deciding whether the patient can be treated as an outpatient or should be referred.

b. Implementation of Reference

Referrals are made when a toddler experiences a serious condition or requires services that cannot be handled at the community health center. Referrals from the clinic are processed online

by a doctor, while referrals from the emergency department (ER) can be made using SISRUTE and directed directly to the emergency department of the designated hospital.

c. Constraint

Most informants stated that there were no major challenges to treatment and referrals within the community health center. The challenges that arose were more related to patients lacking health insurance or having limited funds, which led them to refuse referrals even though their condition required hospital care.

6. Mother Counseling
   a. Implementation

      Counseling for mothers and families of toddlers is provided by several parties, depending on their roles. Doctors and nurses explain the child's condition, home care, danger signs, and prevention. Pharmacists explain how to take medications, schedules, and dosages. Nutritionists provide education regarding food and child intake, especially if nutritional problems are identified.

   b. Constraint

      Although counseling has been conducted, several obstacles have been encountered. These include time constraints, the lack of a private counseling room, and the recipient of information, sometimes not the biological mother but rather the grandmother or caregiver. Furthermore, not all families follow the recommendations given by the staff.

7. Monitoring and Evaluation
   a. Implementation

      Monitoring of toddler pneumonia patients is carried out through follow-up visits and home visits. Informants stated that patients are usually asked to return after their medication runs out or approximately three days after the initial visit. If the patient worsens, staff will consider a referral. Home visits are conducted after the toddler has not returned to the community health center. The program manager explained that home visits are conducted within the community health center's work area, which is five sub-districts. Patients outside the work area are not visited.

   b. Constraint

      Monitoring challenges primarily relate to patient address data and contact numbers. Informants reported that some patients listed temporary addresses, grandmother's addresses, or addresses different from their actual residences. Some also listed inactive phone numbers and homes that were difficult to reach by vehicle. Furthermore, officers who also worked on programs limited time for home visits.

8. Implementation in Community Health Centers

   Implementation of pneumonia management for toddlers at the community health center level includes program preparation, implementation, recording, reporting, and monitoring and evaluation. At Putri Ayu Community Health Center, information dissemination is conducted through internal meetings, monthly mini-workshops, cluster meetings, and cross-sector mini-workshops. Information discussed generally includes program achievements, the number of cases, logistical needs, and service issues. Logistics are prepared through program and pharmacy coordination, with quarterly drug procurement and equipment submissions as needed. Recording and reporting use Electronic Medical Records and E-Puskesmas to facilitate data reporting to the Health Office. Estimated cases have not been calculated independently because the community health center follows the Health Office's targets.

Monitoring is carried out routinely through reports and evaluations of patient conditions, treatment, and implementation of family education.

Output

1. Coverage of Pneumonia Case Findings in Toddlers

   The study results indicate that the coverage of pneumonia cases in toddlers at the Putri Ayu Community Health Center remains low. Based on a document review, in 2025, 36 cases of pneumonia in toddlers were found out of an estimated 136 cases, resulting in a coverage of only 26.49% of the 90% target. The results of triangulation of sources and methods indicate that the low achievement is influenced by passive case detection, the suboptimal role of cadres and networks, and not all toddlers with coughs or difficulty breathing come to the community health center for examination.
2. Compliance of Toddler Pneumonia Management at Putri Ayu Community Health Center with the 2018 Guidelines for Toddler Pneumonia Management at Primary Health Care (FKTP)

   The administrative compliance of toddler pneumonia management at Putri Ayu Community Health Center has met the target, with standard management reaching 100% of the minimum target of 60%. However, triangulation of sources and methods indicates that implementation in the field is not yet fully optimal. Health workers have generally conducted examinations and management in accordance with the 2018 Toddler Pneumonia Management Guidelines at Primary Health Care (FKTP), but there are still discrepancies in several stages, such as maternal counseling, monitoring and evaluation, implementation at the community health center, and suboptimal case detection. This condition is evident in the still low coverage of toddler pneumonia detection.

Discussion

1. Input
   a. Human Resources

      Human resources (HR) are a crucial input in the logic model of health programs, encompassing planning, procurement, and quality improvement in accordance with Minister of Health Regulation Number 13 of 2025. At Putri Ayu Community Health Center, personnel such as doctors, MTBS nurses, ISPA PJ P2, pharmacists, emergency room staff, and nutritionists are readily available across units, supporting the flow of care for sick toddlers. However, sufficiency is not limited to total numbers, but also to distribution, competency, and workload. Management informants assessed this as sufficient, but implementers noted a shortage of nurses during peak periods, multiple tasks, and uneven training on pneumonia in toddlers (particularly in pharmacy, emergency room, and nutrition). This aligns with studies by Amalia & Sabarinah (2023) and Immawanti & Nurpadila (2023) that highlighted barriers to MTBS training and compliance. Overall, HR is partially adequate, but requires widespread capacity building for consistent standards.

   b. Facilities and infrastructure

      Essential infrastructure, in accordance with the 2018 Ministry of Health guidelines, including a service room, oxygen, pulse oximeter, nebulizer, and P2 ISPA forms, are readily available at the Putri Ayu Community Health Center and support daily services. However, the equipment is not yet optimal: the ARI sound timer is broken (replaced by a cellphone), and there is also the absence of oral/injectable ampicillin, gentamicin, salbutamol MDI spacer, KIA book, and home visit forms. This poses a risk to the diagnosis of rapid breathing and wheezing, and subsequent follow-up, similar to the findings of Ria Anggraini *et al*. (2022) and Serlie KA Littik (2024). It is considered adequate but requires regular inspection to ensure equipment is ready for use, not just inventory.

c. Funds

The study results show that funding for the management of infant pneumonia at Putri Ayu Community Health Center comes from the Regional Public Service Agency (BLUD), the Community Service Assistance (BOK), and drug support from the Health Office. BLUD funds are used for in-house services and operational needs, while BOK funds support activities outside the building, such as home visits and family support. Overall, funding is considered sufficient to support routine infant pneumonia services, ensuring continued examinations, treatment, counseling, record-keeping, and referrals.

The challenges encountered were primarily related to delays in disbursement of funds due to administrative delays at the beginning of the year. However, this situation did not directly impact services because essential medicines remained available and service needs could still be covered by the community health center budget.

This finding aligns with research by Salsabila *et al*. (2024), which states that BOK funds are a crucial resource in supporting community health center activities. Research by Ema Hendra *et al*. (2024) also shows that BOK plays a role in supporting promotive and preventive activities, while research by Kurnia (2025) explains that funding constraints are generally related to administrative processes and budget disbursement, rather than direct barriers to service delivery.

d. Policy

The study results show that Putri Ayu Community Health Center has established SOPs, PPK (Community Health Assessment), Ministry of Health guidelines, and the MTBS format as the basis for managing pneumonia in children. However, several supporting units do not yet have SOPs specifically for pneumonia and continue to use their own unit SOPs. Furthermore, the implementation of a cluster-based service system/Primary Service Integration requires updating and re-socialization of SOPs to ensure a more uniform service flow across all units.

The main obstacle is not the lack of policy, but rather the consistency of implementation, such as differences in the reference length of antibiotic administration, limited counseling during busy periods, and the suboptimal use of the KIA handbook. These findings align with research by Ida Safitri Laksono *et al*. (2023) who emphasized the importance of updating and disseminating IMCI guidelines, and research by Vincentia Rizke Ciptaningtyas *et al*. (2025) who stated that the use of multiple pneumonia guidelines can lead to variations in management, necessitating standardization of guidelines and regular training.

2. Program Activity

a. Discovery of Pneumonia Cases in Toddlers

Pneumonia cases in toddlers at Putri Ayu Community Health Center are detected passively through services at the pediatric clinic/IMCI (Micro, Small, and Medium-Scale Community Health Center) and actively through integrated health posts (Posyandu) and community health workers. However, case detection remains largely passive due to the lack of structured reporting from service networks such as clinics, midwives, and hospitals. Furthermore, some families still consider coughs to be a common complaint and choose to seek treatment at home or at other facilities without reporting to the community health center.

These findings align with research by Siti Khodijah *et al*. (2021), Rumita Ena Sari *et al*. (2022), and Dewi Nugraheni Restu Mastuti *et al*. (2025), which showed that pneumonia case detection is suboptimal due to weak reporting networks, early detection, and service system support.

b. Assessing a Child with Cough and/or Difficulty Breathing

Assessment of children with coughs and/or difficulty breathing at Putri Ayu Community Health Center has been conducted through history taking and physical examination. However, respiratory rate counting has not been consistently performed on all toddlers with coughs or colds, especially when there are many patients, and examinations have also been hampered by fussy children.

These findings align with research by Siti Khodijah *et al*. (2021), Vincentia Rizke Ciptaningtyas *et al*. (2025), and Anggraini *et al*. (2022), which showed that the accuracy of pneumonia assessment is influenced by implementation of the examination according to IMCI standards.

c. Classification of Pneumonia in Toddlers

Classification of pneumonia in toddlers at Putri Ayu Community Health Center is based on clinical examination, the MTBS format, standard operating procedures (SOPs), and physician decisions, supported by equipment such as stethoscopes and pulse oximeters. While the classification process is generally well underway, there are still differences in the use of terminology and classification references among staff.

These findings align with research by Andini *et al*. (2024), which demonstrated differences in pneumonia recording and classification among healthcare workers, potentially impacting consistency in case management and reporting. Therefore, a common understanding and application of guidelines is needed to ensure more uniform classification, recording, and follow-up of pneumonia cases in children.

d. Pneumonia Diagnosis

Diagnosis of pneumonia in toddlers at Putri Ayu Community Health Center is performed through anamnesis, physical examination, and necessary supporting tests, supported by a nurse or midwife completing the MTBS form. However, communication of the diagnosis to families remains suboptimal because explanations of the disease and its severity are not always clearly conveyed.

These findings align with research by Laxmi Nurul Suci (2020), Tashya Eka Melinda *et al*. (2025), and Purwati *et al*. (2023), which emphasized the importance of screening according to MTBS standards and family education in managing toddler pneumonia.

e. Treatment and Referral

Treatment for toddler pneumonia at Putri Ayu Community Health Center involves administering amoxicillin, symptomatic medications, and nebulization or oxygen therapy for shortness of breath. Referrals for severe cases are made through the online system or SISRUTE.

These findings align with research by Laxmi Nurul Suci (2020) and Assifatun Nisa (2024), which found that amoxicillin and supportive therapy are essential components of pediatric pneumonia management. However, there are still differences in the duration of antibiotic administration, inconsistent pre-referral procedures, and the need to strengthen family education regarding referrals.

f. Mother Counseling

Counseling for mothers and families of toddlers at the Putri Ayu Community Health Center is provided by doctors, nurses, pharmacists, and nutritionists, depending on their roles. Education provided covers the child's condition, danger signs, home care, medication use, and nutritional needs. This demonstrates that toddler pneumonia services focus not only on treatment but also on educating families about child care at home.

The counseling implementation aligns with the Integrated Management of Sick Toddlers (IMCI) approach. The Ministry of Health's SATUSEHAT explains that IMCI is an integrated approach to reducing morbidity and mortality among toddlers through curative, promotive, and

preventive services. Furthermore, the counseling also aligns with Minister of Health Regulation No. 25 of 2014 concerning Child Health Efforts, which emphasizes the importance of family education in toddler health care.

However, the use of the KIA Handbook in counseling is not optimal because families often do not bring it to medical appointments. The 2024 KIA Handbook from the Ministry of Health serves as a medium for education and monitoring toddler health. Therefore, counseling needs to be strengthened through the use of the KIA Handbook, providing brief educational materials, and teaching-back techniques to help families better understand the care and warning signs of toddler pneumonia.

g. Monitoring and Evaluation

Pneumonia monitoring is conducted through follow-up visits and home visits. Patients are typically asked to return after medication runs out or within three days, although the IMCI guidelines recommend a follow-up visit within two days. Obstacles to monitoring include unclear patient addresses, difficult home access, and staff having multiple duties. Follow-up visits to toddlers with pneumonia at the Putri Ayu Community Health Center are generally conducted after three days or when medication runs out, although the IMCI guidelines specify a two-day follow-up to monitor the child's condition. Home visits also face challenges such as inaccurate patient addresses and contact numbers, patients living outside the work area, difficult home access, and staff having multiple duties, resulting in suboptimal monitoring of toddlers.

The findings of this study are supported by research by Siti Khodijah *et al*. (2022) at the Ciampea Community Health Center, which stated that the management of pneumonia in children includes follow-up, recording and reporting, and monitoring and evaluation. The study showed that several stages of management were still not fully compliant with guidelines, particularly in the evaluation and monitoring aspects. Therefore, strengthening record keeping, complete patient data, and monitoring are crucial in implementing the pneumonia program for children.

h. Implementation in Community Health Centers

Implementation of pneumonia management for toddlers at Putri Ayu Community Health Center has progressed through preparation, implementation, recording, reporting, and program monitoring and evaluation. Dissemination is conducted through internal meetings, mini-workshops, and cluster meetings to discuss program achievements, cases, logistics, and service challenges. Logistics are provided through pharmaceutical planning and procurement from the Health Office, although some facilities still need to be improved.

Recording and reporting have utilized Electronic Medical Records and E-Puskesmas, simplifying case reporting to the Health Office. However, estimating pneumonia cases in children is still not independently calculated, as Puskesmas are more focused on Health Office targets.

In terms of monitoring and evaluation, activities are conducted routinely through monthly reports and mini-workshops involving program managers, cluster leaders, and community health center heads. Evaluations address not only the number of cases but also patient conditions, treatment adherence, side effects, changes in symptoms, and the implementation of family education. However, program implementation remains suboptimal due to logistical limitations and a lack of robust analysis of estimated cases of pneumonia in children.

The findings of this study are supported by research by Viska Andini *et al*. (2024) at the Paal V Community Health Center in Jambi City, which found that the implementation of the toddler pneumonia management program can be hampered if the personnel and facilities are inadequate, including the suboptimal availability of supporting equipment.

3. Output
   a. Coverage of Case Findings of Pneumonia in Toddlers

      The number of pneumonia cases in toddlers at Putri Ayu Community Health Center is low (53 cases/year in 2025, 2-3/month or zero), experienced by all informants; coverage is 26.49% of the 90% target (Jambi Health Office 2025 report), below the SPM as per Siti Khodijah *et al*. (2022) at 34.05%. This is not due to a low incidence, but to the dominant passive (polyclinic visits), minimal reporting from cadres/networks (clinics/midwives/hospitals), and families purchasing their own medication—in line with Sri Maya Guswahyuni *et al*. (2019). Putri Ayu Community Health Center's efforts in detecting pneumonia in toddlers still consist of educating cadres and the community to immediately bring their children to the community health center if they experience symptoms of coughing or shortness of breath. These results align with research by Siti Khodijah *et al*. (2022) which states that cadre involvement in detecting pneumonia can be done through screening during Integrated Health Posts (Posyandu), directing toddlers to seek treatment at the community health center, and assisting with visits with village midwives. Therefore, the role of cadres needs to be strengthened not only as recipients of information, but also as part of the early detection of pneumonia cases in the community.

   b. Compliance of the Implementation of Pneumonia Management in Toddlers with the 2018 Primary Health Care Guidelines

      The administrative compliance of pneumonia management for children at Putri Ayu Community Health Center has met the target, with standard management reaching 100% of the minimum target of 60%. Several service components also comply with guidelines, such as the use of the IMCI (Citric Immunization) flow, clinical examination, amoxicillin administration, symptom-based therapy, use of nebulizers or oxygen for patients with shortness of breath, counseling on smoke exposure prevention, and referral for severe cases.

      However, triangulation results indicate that management implementation is not evenly distributed across all components. From an input perspective, there are still limited human resources, uneven training, incomplete facilities and logistics, limited funds for home visits, and outdated SOPs. From a process perspective, case finding remains predominantly passive, respiratory rate checks are not always performed, communication of diagnoses to families is not optimal, there are differences in the duration of antibiotic administration, follow-up visits do not meet the two-day guideline, and home visits are hampered by inaccurate patient address and contact data. Furthermore, community health centers have not independently calculated estimated cases of pneumonia in children under five.

      From the output aspect, the coverage of pneumonia case detection in toddlers is still low, namely 26.49% of the 90% target, so that even though the administrative management target has been achieved, implementation in the field is still not fully consistent with the guideline standards.

CONCLUSION

This study found that the implementation of the ISPA Control Program in the management of pneumonia in toddlers at Putri Ayu Community Health Center was partially in accordance with the 2018 FKTP guidelines, with strengths in the availability of human resources across units, basic facilities such as oxygen and pulse oximeters, BLUD/BOK funds that support routine services, and existing SOP and MTBS policies. However, input was not optimal due to a shortage of nurses during peak periods, uneven pneumonia training, a broken ARI sound timer, the absence of key logistics such as ampicillin and KIA Handbooks, and SOPs that were not updated for clusters. The process showed a dominance of passive

discovery (coverage of only 26.49% of the target of 90%), inconsistent breath counts for all coughs, different antibiotic durations, and re-monitoring of 3 days instead of 2 days. The low output of case coverage was due to minimal reporting of networks and family behavior, even though amoxicillin treatment and referrals were running well.

Limitations of this study include the focus on a single case study in an urban community health center, the lack of longitudinal quantitative data, and the potential for informant recall bias. Suggestions for further research include a multi-community health center evaluation using mixed methods, a cost-benefit analysis of training interventions, and a study of the impact of digitalized reporting on case coverage. Practical implications include prioritizing improvements to the ARI timer, ensuring equitable training, activating cadre networks for active detection, updating cluster SOPs, and conducting monthly audits of the IMCI process to improve consistency and achieve the 90% SPM target.

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