



# Expert Consensus on Interprofessional Collaboration (IPC) Guidelines on Stunting Management in Indonesian Primary Healthcare (Puskesmas)

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## Abstract:

**Background:** Stunting remains a significant public health challenge in Indonesia, with a prevalence of 21.6%, as of 2022. Despite government efforts, progress in reducing stunting rates has been uneven across the country. Primary healthcare facilities (Puskesmas) play a crucial role in implementing stunting prevention and management strategies, but their effectiveness is often hampered by a lack of coordinated interprofessional collaboration.

**Objective:** This study aimed to develop expert consensus guidelines for Interprofessional Collaboration (IPC) in stunting management within Indonesian primary healthcare settings, identifying key professionals, defining roles, and proposing strategies to enhance collaboration.

**Methods:** The expert consensus process, involving 51 participants from various healthcare disciplines and organizations, identified doctors, nutritionists, nurses, midwives, and public health specialists as key professionals, with specific roles outlined for each.

**Results:** Consensus was reached on focusing interventions for the life cycle, particularly the first 1000 days of life, and on the importance of primary healthcare transformation. Strategies to enhance collaboration included leadership from Puskesmas heads, clear role delineation, regular coordination meetings, and periodic interprofessional training.

**Conclusion:** There was unanimous support for developing comprehensive IPC guidelines, with 81% deeming it very important. Implementation recommendations included guideline socialization among Puskesmas leadership and professional organizations and organizing interprofessional collaboration training.

**Keywords:** Consensus, Stunting, Interprofessional collaboration, Prevention, Primary healthcare.

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## 1. INTRODUCTION

The persistent prevalence of stunting in Indonesia has been a longstanding concern, primarily driven by nutritional inadequacies and recurring childhood infections [1]. Globally, an estimated 22.3% or 148.1 million children under the age of five suffer from stunting, with Asia bearing the highest burden [2]. Despite some improvements, Indonesia's stunting rate remains high at 21.6%, as indicated by the 2022 Indonesia Nutritional Status Survey [3]. To address this issue, the Indonesian government has made significant commitments, prioritizing stunting reduction in the National Medium-term Development Plan 2020-2024 and issuing Presidential Regulation Number 72 of 2021 to accelerate stunting reduction efforts nationwide [4]. Taken together, addressing stunting remains a persistent issue in Indonesia, highlighting the crucial need for strategic actions to decrease its occurrence and persistence.

Primary healthcare facilities (Puskesmas) in Indonesia serve as critical institutions in the fight against stunting, implementing specific interventions outlined by the Minister of Health Decree Number 1928 of 2022 [5]. These centers are tasked with receiving referrals from integrated health posts (posyandu) and managing malnutrition cases in toddlers. Moreover, healthcare professionals play a crucial role in empowering mothers and caregivers by enhancing their knowledge and skills in stunting prevention and management [6].

## 2. CURRENT LANDSCAPE AND CHALLENGES

Despite the implementation of various stunting prevention programs in Indonesia, their effectiveness remains suboptimal, highlighting the urgent need for strategic measures to address this challenge comprehensively [7]. To illustrate the current situation, an examination of regional data has revealed significant disparities in stunting prevalence across Indonesia.

According to the 2018 Basic Health Research (Riskesdas), the national stunting prevalence was 30.8%. However, there were significant regional variations, which are listed as follows:

1. Highest prevalence: East Nusa Tenggara (42.6%).
2. Lowest prevalence: DKI Jakarta (17.7%) [8].

The 2021 Indonesia Nutrition Status Study (SSGI) showed overall improvement, with national stunting rates decreasing to 24.4%. However, regional disparities persisted:

1. 12 provinces still had stunting rates above 30%.
2. 3 provinces (West Sulawesi, West Nusa Tenggara, and Aceh) had rates exceeding 35% [9].

These data highlight the uneven progress across different regions of Indonesia.

Rural vs. Urban Disparities:

1. Rural areas consistently show higher stunting rates compared to urban areas.
2. In 2018, the stunting prevalence in rural areas was 34.0% compared to 27.5% in urban areas.

3. By 2021, while both areas showed improvement, the gap remained: rural (29.5%) vs. urban (24.8%) [10].

Program Performance Examples:

### 1. Community-led Total Sanitation (STBM) Program

a) Aim: The aim of this program was to improve sanitation practices to reduce environmental factors contributing to stunting.

b) Results: By 2020, 73.7% of villages were declared Open Defecation Free (ODF). However, sustainability remained a challenge, with some villages reverting to previous practices [11].

### 2. First 1000 Days of Life Movement (Gerakan 1000 HPK):

a) Aim: Interventions were focused on the critical period from conception to a child's second birthday.

b) Results: While awareness has increased, implementation varied widely. A 2019 study in Central Java found that only 65% of targeted pregnant women received the full package of interventions [12].

### 3. Integrated Management of Acute Malnutrition (IMAM) Program:

a) Aim: This program aimed at early detection and treatment of acute malnutrition in children under five.

b) Results: A 2020 evaluation in South Sulawesi showed that while the program improved detection rates, only 60% of identified cases received proper follow-up due to resource constraints [13].

These examples have demonstrated that while programs have been implemented nationwide, their effectiveness has varied significantly across regions and faced challenges in consistent implementation and follow-up.

Interprofessional collaboration among healthcare practitioners is essential for developing effective strategies to combat pediatric stunting, which underscores the importance of a scientific approach to Indonesia's stunting prevention efforts [14]. However, the varying results across regions suggest that collaboration and implementation strategies need to be tailored to local contexts and challenges.

Currently, there are several guidelines and consensus both domestically and internationally that provide guidance for the clinical standard diagnosis and treatment of stunting [15-17]. However, there are still many issues that need to be confirmed and standardized in clinical practice, especially regarding interprofessional collaboration in accelerating stunting reduction in Indonesian primary healthcare/Puskesmas. The regional disparities and program implementation challenges highlight the need for more comprehensive, locally adopted guidelines that can address the specific needs and constraints of different areas in Indonesia [18].

## 3. CONSENSUS-BUILDING PROCESS

To address these challenges, a comprehensive expert consensus process has been initiated. This study has

involved 51 experts, consisting of 2 keynote speakers from the Ministry of Health and Ministry of Home Affairs, 5 expert speakers from professional associations (IDI, IBI, PERSAGI, PPNI, and IAKMI), 12 respondent experts (verbally), and 32 expert participants comprising academics, representatives of regional government agencies (OPD), professional organizations, Indonesian community health center acceleration (APKESMI), and stunting issue activists. This study has received ethical approval from the medical and health research ethics committee of the Muhammadiyah University of Prof. Dr. Hamka (approval number 03/23.10/02904).

## 4. EXPERT CONSENSUS RESULTS

### 4.1. Accelerated Stunting Reduction Approach

Consensus 1: Accelerating the reduction of stunting needs to be done with a focus on the life cycle, especially during the first 1000 days of life.

The accelerated stunting reduction intervention needs to focus on the pathways leading to stunting and implement prevention processes oriented towards the life cycle, especially during the first 1000 days of life [19]. Risk identification and preventive interventions can be carried out during pre-pregnancy and pregnancy periods [20]. Meanwhile, efforts for weighing and screening should be conducted during the under-five years (preschooler) period. If a preschooler fails to show growth curve improvement and is at risk of malnutrition problems, he/she needs to be treated according to the indication [21]. There is a need for prioritization to screen and manage toddlers with nutritional problems or at risk of stunting to prevent stunting [22]. Stunting issues need to be addressed from upstream to downstream, with management at promotive, preventive, treatment, and rehabilitative stages. Thus, the reduction rate of stunting can be accelerated.

### 4.2. The Strategic Role of Primary Healthcare/puskesmas

Consensus 2: Primary healthcare (Puskesmas) transformation is the first pillar in the transformation of the Indonesian health system.

Within the framework of the stunting program, Puskesmas carries out preventive efforts to prevent new cases of stunting by becoming the forefront and driver for the implementation of specific interventions, secondary prevention, and the referral process [23]. Puskesmas' achievements often contribute to national achievements.

In the secondary prevention scheme for stunting management, Puskesmas plays a role in the early management of toddlers at risk of stunting/having nutritional problems [24]. However, if there are cases that cannot be handled at Puskesmas, then a referral to the hospital is carried out [25]. The challenge faced in this referral process is that not all cases come to the hospital for further examination. Therefore, monitoring of the referral process is needed so that cases can be handled.

The main strategy that can be carried out by

Puskesmas to accelerate the reduction of stunting is the synergy of public health efforts and individual health efforts. This can be supported by the governance of Puskesmas based on the 5 pillars of the national strategy for accelerating stunting: (1) leadership commitment in managing the stunting program at Puskesmas; (2) Puskesmas actively collaborating with cross-sectors; (3) Puskesmas management conducting integrated planning to ensure effective and efficient allocation of resources for the stunting reduction program; (4) active participation in 8 convergence actions; and (5) Puskesmas having a monitoring and evaluation system, including monitoring nutritional status and reporting results periodically.

#### 4.2.1. Leadership Commitment

Leadership commitment plays a pivotal role in the effective management of stunting in Puskesmas [26]. When leaders are committed to addressing stunting, it sets the tone for the entire healthcare system to prioritize this critical issue. Their commitment drives the allocation of resources, the implementation of evidence-based interventions, and the establishment of sustainable programs aimed at reducing stunting prevalence [27]. Moreover, strong leadership fosters collaboration among healthcare professionals, policymakers, and communities, creating a cohesive approach to combat stunting comprehensively [28]. Ultimately, leadership commitment in stunting management within Puskesmas is essential for driving positive outcomes and improving the health and well-being of children in communities [29].

Several examples of leadership commitment in Indonesia, such as the commitment from the Depok City Government with regulatory support, include the following:

1. Mayor's regulation no. 99 of 2022 concerning the acceleration of stunting reduction in Depok City.
2. Mayor of Depok circular letter no. 440/639-Dinkes regarding the publication of stunting data in 2022 on efforts to accelerate stunting reduction for all health partners.
3. Mayor of Depok circular letter no. 440/31-Dinkes of 2023 concerning monitoring toddler growth and utilization of community-based nutrition recording and reporting applications.
4. Mayor of Depok circular letter no. 440/17-Dinkes of 2023 concerning the movement to protect families from stunting through the cultivation of animal protein consumption within families (Belimbing Dewa Dewi Movement).
5. Mayor of Depok circular letter no. 440/92-Dinkes of 2023 concerning assistance in the consumption of iron supplementation tablets for adolescent girls.

Indicators for stunting reduction are included in Puskesmas's strategic plan indicators as a form of leadership commitment to addressing stunting. Several examples of supporting resources include the following:

1. Supporting resources in the form of fund allocation.

a) Support resources including the availability of budget from the regional budget, Puskesmas operational assistance, and public service agency funds.

b) Budget allocation in the mandatory village fund menu supporting the acceleration of stunting reduction.

2. Supporting resources in the form of infrastructure and facilities.

a) All integrated health posts (Posyandu) having anthropometric equipment.

#### 4.2.2. Communication for Behavior Change and Community Empowerment

Communication for behavior change and community empowerment plays a crucial role in the effective management of stunting in primary healthcare [30]. By promoting open dialogue and fostering a sense of community ownership, stakeholders can collaborate to identify and address the root causes of stunting [31]. Effective communication strategies can help raise awareness about the importance of proper nutrition, hygiene, and healthcare practices, empowering communities to take action and make positive changes in their daily lives [32]. Additionally, community-based interventions can help to build trust and establish a foundation for long-term behavior change, ultimately contributing to the reduction of stunting prevalence in Puskesmas settings.

Supporting capacity building for human resources:

1. The malnutrition management team at the community health center is trained.

2. Training on monitoring toddler growth and development for healthcare workers.

3. Ultrasound training for doctors.

4. Training for community health cadres as nutrition advocates and stunting ambassadors.

Several instances of the government-led initiative, the 'Depok Success Free Stunting' movement, have showcased active community participation in creating a child-friendly city under the "Dstunting Menara" program.

1. Beautiful motorcycle taxi carrying food for stunted toddlers (*Ocan Bananas*).

2. Reaching vulnerable families with love signs (*Cawan Kasih*).

3. Swift action to prevent stunting with family tutors (*Gercep Ceting Surga*).

4. Parental storytelling to promote healthy eating in order to prevent early childhood stunting (*Dora Masa Kini*).

5. Depok community preferring diverse, nutritious, balanced, and safe food to prevent stunting (*Mpok Sukma Bawa Canting*).

6. Unity in "dasawisma" with family support teams (*Dawis Sahabat Pkk*).

Penta-helix collaboration with various activities:

1. Implementation of integrated health posts and stunting management in collaboration with academics.

2. Collaboration on stunting management with the Center for Indonesia's Strategic Development Initiatives (CISDI).

3. Media coverage through reporting on stunting management in the working area of Duren Seribu primary healthcare on [beritadepok.go.id](http://beritadepok.go.id).

#### 4.2.3. Convergence of Specific and Sensitive Interventions

The convergence of specific and sensitive interventions is essential for the effective management of stunting in Puskesmas [33]. By combining targeted interventions with a holistic approach that addresses the unique needs and challenges faced by individuals and communities, healthcare providers can develop comprehensive strategies that promote long-term behavior change and empower communities to take ownership of their health [34]. This approach can help to address the complex interplay of factors contributing to stunting, including poverty, malnutrition, and inadequate healthcare access [35]. By working together to identify and address these root causes, healthcare providers can help to create a more sustainable and equitable healthcare system that promotes the health and well-being of all individuals, regardless of their background or circumstances [36].

Several instances of the innovations that can be implemented in Indonesia are as follows:

1. Candidate bride ready for dental health check-up program (*Catin Smart*): This innovation was initiated due to many complaints of dental problems among pregnant women. Activities included dental check-ups and the provision of Health Information and Education (HIE).

2. Pregnant women detection program (*Detil*): Innovation laid in the form of creating a WhatsApp Group (WAG) to detect and trace high-risk pregnant women and maternal deaths. The WAG included cadres, neighborhood leaders, and community leaders.

3. Let's fight and prevent stunting in infants program (*Api Cinta*): The innovation laid in stunting management with activities, such as complementary feeding counseling, toddler classes, pregnant women counseling, pregnant women classes, complementary feeding demonstrations, community discussions, meetings for stunted toddlers, and health promotion on clean and healthy living behavior.

4. One cadre, one stunted toddler program (*Saka Banting*): This program has involved cadres providing assistance to stunted toddlers, conducting complementary feeding counseling, referring suspected stunted toddlers, cooking using local ingredients, and acting as beautiful motorcycle taxi carrying food for stunted toddlers (*Ocan Bananas*).

5. Toilet triggering to prevent stunting program (*Jam Genting*): This program included stunted toddler registration, healthy home inspections, grouping stunted toddlers with unhealthy home conditions, and toilet triggering. The working area of Duren Seribu primary healthcare has achieved 100% Open Defecation Free (ODF) status.

6. Finding and visiting toddlers with incomplete immunization program (*Cuber Lusi*): This program has involved empowering cadres for data collection, multi-sectoral empowerment for information dissemination, and home visits to toddlers with incomplete immunization.

7. Assistance in referrals for stunted toddlers/malnutrition.

8. Home visits for toddlers with nutrition problems.

9. Mantoux test at the primary healthcare level for toddlers with nutrition problems.

Several instances of the innovation in specific nutrition interventions are as follows:

1. Iron supplementation for adolescent girls.

2. Integrated maternal health service K1.

3. Creation of WhatsApp groups for pregnant and postpartum women (*Wamilfas Cetar*).

4. Creation of WhatsApp groups for children under five (toddlers) in Pademangan: smart mother happy child toddler class (*Kebali Berenang*).

5. Home visits by area coordinators "*Peta Dunia*" team.

Innovations in sensitive nutrition interventions are listed as follows:

1. Strengthening the community-led total sanitation team in the Pademangan Barat sub-district.

2. Construction of septic tanks (independent and communal) in Pademangan Timur sub-district.

3. Focus group discussion of community-led total sanitation activities in the Ancol sub-district for community-led total sanitation implementation in the area.

4. Collaboration with IUWASH in mentoring and consultation for a community-led total sanitation site plan in the Ancol sub-district.

5. Facilitation of population data completeness supporting: national health insurance registration.

6. Provision of access to health services and family planning.

7. Provision of access to conditional cash assistance for underprivileged families, such as integrated social welfare data by the social welfare office.

Collaborative innovations in stunting reduction interventions at Pademangan Community Health Center (*Klenting Puspa*) are described below:

1. "*Cating*" Program: This program involves important records for reducing stunting. It contains data on stunted toddler examinations that can be accessed by various sectors.

2. *Mamang Turing* Program: This innovation includes eating together to reduce stunting in Pademangan. This involves providing animal protein supplementary food, such as eggs and milk, and nutrition posts.

3. Warning Program: It is a WhatsApp group for monitoring stunted toddlers, where there is a group of mothers of stunted toddlers whose daily food intake is monitored by primary healthcare staff.

#### 4.2.4. Food Security and Nutrition

Food security and nutrition are crucial components in the interprofessional collaboration for addressing stunting at primary healthcare level [37]. When healthcare professionals, nutritionists, community workers, and policy-makers work together, they can develop comprehensive strategies that prioritize access to nutritious foods and promote proper dietary practices to combat stunting effectively [38]. By integrating expertise from various disciplines, such as healthcare, nutrition, and community development, a more holistic approach can be undertaken to address the multifaceted issues contributing to stunting [39]. This collaborative effort ensures that interventions are evidence-based, culturally sensitive, and sustainable, leading to improved outcomes in stunting management [40]. Ultimately, by fostering interprofessional collaboration focused on food security and nutrition, healthcare teams can make significant strides in reducing stunting prevalence and improving the overall health of communities.

Several instances of the food security and nutrition program at Duren Seribu Community Health Center, Depok City, West Java Province, involve collaboration with corporate social responsibility FIF group to provide high-protein nutritious food for stunted toddlers.

Several instances of the food security and nutrition program at Pademangan Sub-district Health Center, North Jakarta, Jakarta Province, include the following:

1. Innovation program sharing for others by Pademangan Sub-district Health Center (*Bersama Pakde*); provision of supplementary feeding consisting of eggs and milk contributed by Pademangan sub-district health center's civil servants, targeting 14 stunted toddlers.

2. Distribution of food supplies being a corporate social responsibility:

a) Bi-weekly egg stocks from PT. Charoen Pokphand Indonesia, Tbk.

b) Distribution of milk from PT. Pembangunan Jaya Ancol.

#### 4.2.5. System Data, Information, Research, and Innovation

System data, information, research, and innovation are essential components in the effective management of stunting in Puskesmas [41]. By establishing robust systems for data collection and analysis, healthcare providers can identify trends and patterns in stunting prevalence, informing the development of targeted interventions and strategies. Additionally, research and innovation can help to identify new and emerging approaches to stunting management, ensuring that healthcare providers are equipped with the latest knowledge and tools to address this critical issue [42]. By leveraging data, information, research, and innovation, healthcare providers can create a more evidence-based and data-driven approach to stunting management, ultimately leading to improved outcomes and better health outcomes for individuals and communities.

Several instances of the system, data, information, research, and innovation in Duren Seribu Community Health Center, Depok City, West Java Province, are as follows:

1. Stunting audit for pregnant women.
2. Evaluation of cases with stunting issues.
3. Postpartum visits.
4. Utilization of community-based nutrition electronic recording and reporting system.

Several instances of the system, data, information, research, and innovation in Pademangan Sub-district Health Center, North Jakarta, Jakarta Province, are as follows:

Innovation program “*Berbagi untuk sesama*” (sharing for others) by Pademangan Sub-district Health Center (*Bersama Pakde*), with monitoring processes including the following:

1. Monitoring and visits to malnourished toddlers.
2. Evaluation of nutritional status.

In governance implementation, primary healthcare needs to utilize the 8-convergence action approach with available nomenclature to achieve minimal service standards in the health sector. Puskesmas needs to ensure planning and budgeting programs supporting the acceleration of stunting reduction, including the quality of human resources and the provision of facilities and food interventions. Therefore, in planning and fulfilling human resources, facilities, infrastructure, medications, medical devices, and logistical food materials must be standardized properly.

To optimize the role of Puskesmas, priority-based planning stages are necessary. In the context of accelerating stunting reduction, Puskesmas needs comprehensive information and data regarding at-risk stunted toddlers and toddlers with stunting. This can be achieved through strengthening recording and reporting through the community-based nutrition electronic recording and reporting system. Thus, the healthcare professionals at Puskesmas can analyze and plan more effectively.

### 4.3. Healthcare Professionals Involved in Stunting Management

Consensus 3: Interprofessional collaboration being important in the stunting management at Puskesmas

The healthcare professionals involved in the management of stunting at Puskesmas are depicted in Table 1. Based on the consensus, all experts (100%) have agreed that doctors and nutritionists/nutrition implementers play a role in stunting management, while nurses, midwives, health promotion, and behavioral science workers have been included in a consensus of 94% of experts. Furthermore, 91% of experts also agreed that environmental health workers/sanitarians are involved in the management, and pharmacists/pharmacy technicians and

medical laboratory technologist experts have been included in the consensus of 84% of experts. Followed by other healthcare workers, dentists have been included in the consensus of 75% of experts.

**Table 1. The healthcare professionals involved in the management of stunting at primary healthcare level.**

No.	Healthcare Professionals	Expert Consensus
1.	Doctors	100%
2.	Nutritionists	100%
3.	Nurses	94%
4.	Midwives	94%
5.	Health promotion and behavioral science workforce	94%
6.	Environmental health workers/sanitarians	91%
7.	Pharmacist personnel/pharmaceutical technicians	91%
8.	Medical laboratory technologists	84%
9.	Other healthcare personnel: dentists	75%

In the initiation document of the guidelines, there is an explanation section regarding the proposed roles of each healthcare worker in accelerating stunting reduction management. There are 5 roles of healthcare workers identified in the initiation guidelines, namely doctors, nurses, midwives, nutritionists/nutrition implementers, and public health workers (including health promotion and behavioral science workers as well as environmental health workers).

These components have been considered suitable by 72% consensus of experts. Considering the consensus on the roles of pharmacists, medical laboratory technologist experts, and dentists, further development and adjustment are needed in the initiation guidelines. Healthcare workers as service providers in Puskesmas have their respective responsibilities in their areas of expertise. In the context of accelerating stunting reduction, the role of each healthcare worker needs to be continuously interconnected, supported, and strengthened through inter-professional collaboration, programs, and sectors. Specifically, experts consider it important to be able to delineate the role of primary healthcare leadership in coordinating interprofessional collaboration. To work collaboratively, each healthcare worker needs to have a common understanding of the pathways leading to stunting and multifactorial determinants, thus enabling them to position their roles and understand the roles of each healthcare professional. The roles of healthcare professionals in the management of stunting at the primary healthcare level are depicted in Table 2.

### 4.4. Interprofessional Collaboration in Stunting Management at Primary Healthcare Level (PUSKESMAS)

Consensus 4: Puskesmas requires interprofessional collaboration strategies to achieve optimal goals.

**Table 2. The roles of healthcare professionals in the management of stunting at the primary healthcare level.**

Healthcare Professionals	Roles
Doctor	<ul style="list-style-type: none"> <li>- Receive referrals from nutrition officers at the community nutrition centre, conduct reassessment upon registration, perform initial diagnostic determination studies, develop care plans, and administer treatment.</li> <li>- The delegation of authority from pediatricians to general practitioners at primary healthcare facilities is permissible following training to administer special medical food upon recommendation by the Dietary Supplement Administration (DSA) or through telemedicine methods. In instances where patients at primary healthcare facilities decline referral to general hospitals or are unable to access general hospitals due to distance, general practitioners at primary healthcare facilities must undergo training and authorization to provide processed food for special medical needs. This is in accordance with Minister of Health Regulation No. 29 of 2019 and Minister of Health Decree No. 1186 of 2022 concerning the clinical management guidelines for doctors at primary healthcare facilities, which encompasses the management of nutrition disorders contributing to stunting or stunted growth.</li> </ul>
Midwives	<ul style="list-style-type: none"> <li>- Work in a team-based and interprofessional collaboration, especially for referral care.</li> <li>- Act as family support team coordinator.</li> <li>- Midwives engage in promotive and preventive efforts, provide care for pre-pregnant and pregnant women, assist in normal deliveries, offer postpartum care, provide care for infants and toddlers and reproductive health services to women, detect complications in mothers and children, implement emergency care within their competencies and authority, refer high-risk and complicated cases, mobilize community participation, and empower women and families.</li> </ul>
Nutritionists	<ul style="list-style-type: none"> <li>- Provide nutrition education and support to schools (preschool to high school), Islamic boarding schools, and newlyweds, and family support, training, and refresher courses for cadres, family welfare movement, and workers.</li> <li>- Promote preventive efforts, including implementation of local nutritious food gardens, activation of nutrition counselling at integrated health post tables, provision of family support for engaged couples, and acting as nutrition ambassadors.</li> <li>- Provision of integrated nutritional services (curative) by community health centre nutrition officers and accompanying cadres: tracking stunting and severe malnutrition, laboratory examinations, anthropometric measurements, nutrition counselling, outpatient monitoring, and accompanying toddlers.</li> </ul>
Nurses	<ul style="list-style-type: none"> <li>- Employ an approach that focuses on individuals, families, and communities.</li> <li>- Conduct comprehensive analyses, listen to concerns, and provide care.</li> <li>- Ensure community understanding of stunting and interventions using the 5 pillars of stunting prevention and intervention.</li> <li>- Perform assessments, diagnoses, and nursing interventions.</li> <li>- Facilitate referrals.</li> <li>- Administer emergency care according to competency.</li> <li>- Provide nursing consultations and collaborate with physicians.</li> <li>- Conduct health education and counselling.</li> <li>- Manage medication administration for clients as per medical prescriptions or over-the-counter medications within legal limitations.</li> </ul>
Public health specialists	<ul style="list-style-type: none"> <li>- Surveillance: Process and analyze data utilizing existing data, present it as information, and identify different dominant factors.</li> <li>- Development of Communication Information and Education (CIE) media: Effectively utilize various CIE media types for different communities by adapting content, language, and communication channels.</li> <li>- Counselling: Conduct counselling alongside other healthcare professionals. Topics must include stunting, the first 1000 days of life, anemia, clean and healthy living behavior, immunization, smoking, <i>etc.</i> The target audience should include adolescent girls, newlyweds, women of reproductive age, pregnant women, breastfeeding mothers, husbands/other family members.</li> <li>- Community organization and empowerment: Plan, organize, or develop various activities, prepare sponsorship proposals, motivate community leaders in forming health cadres, establish networks for PHBS formation in communities, and mobilize community groups in utilizing integrated health posts.</li> <li>- Advocacy: Direct towards stakeholders, programs, and policies. Advocacy processes can be conducted according to strategies in each region.</li> </ul>

The complexity of stunting necessitates a multidisciplinary approach, making interprofessional collaboration crucial for effective management and prevention [43]. However, several barriers impede optimal collaboration among healthcare professionals in Indonesian primary healthcare settings. These include the following:

#### 1. Structural barriers:

a) Lack of formal policies or guidelines promoting interprofessional practice in stunting management [44].

b) Inadequate physical spaces in Puskesmas for collaborative meetings or case discussions [45].

#### 2. Professional barriers:

a) Hierarchical relationships between different health professions, potentially hindering open communication [46].

b) Limited understanding of other professionals' roles and expertise in stunting management [47].

#### 3. Educational barriers:

a) Insufficient interprofessional education in pre-service training programs [48].

b) Lack of continuing education opportunities focused on collaborative practice [49].

#### 4. Organizational barriers:

a) Heavy workloads and time constraints, limiting opportunities for collaborative activities [50].

b) Absence of incentives or recognition for engaging in interprofessional practice [51].

Concrete examples of challenges faced by healthcare workers include the following:

#### 1. Limited human resources and high workload

Example: A Puskesmas in rural East Java is severely understaffed, with only one nutritionist serving a population of over 30,000. This nutritionist is overwhelmed with individual case management and struggles to find time for collaborative meetings with other healthcare professionals to discuss comprehensive stunting interventions.

Research support: Rizal and van Doorslaer highlighted the uneven distribution of healthcare workers in Indonesia, particularly affecting rural areas and impacting the quality of care provided [52].

#### 2. Lack of integrated information systems

Example: In a Puskesmas, the midwife records a child's growth data in a paper-based maternal and child health book (*Buku KIA*). However, this information is not readily accessible to the doctor or nutritionist during follow-up visits, leading to fragmented care and missed opportunities for early stunting intervention.

Research support: The challenges of health information system fragmentation in Indonesia affect continuity of care and interprofessional collaboration [53].

#### 3. Cultural and language barriers

Example: In a remote area of Papua, a nurse from Java struggles to communicate effectively with local community health workers (*kader*) about stunting prevention strategies due to language differences and cultural misunderstandings about local feeding practices.

Research support: Cultural competence in healthcare delivery is important considering Indonesia's diverse cultural landscape [54].

#### 4. Lack of structured collaboration mechanisms

Example: A Puskesmas has no formal structure for interprofessional meetings. Discussions about stunting cases take place informally and sporadically, leading to inconsistent follow-ups and fragmented care plans.

Research support: There is a need for structured collaboration mechanisms in Indonesian primary health-care to improve service integration [13].

#### 5. Conflicting program priorities

Example: In a Puskesmas, the nutrition team focuses on supplementary feeding programs for stunting, while the maternal health team prioritizes antenatal care. The lack of integration between these programs leads to missed opportunities for comprehensive stunting prevention.

Research support: Beal *et al.* emphasized the need for multi-sectoral collaboration in addressing stunting in Indonesia, highlighting how siloed approaches can reduce effectiveness [55].

To improve interprofessional collaboration, the experts have proposed the following strategies:

##### 1. Policy development

a) Establishment of formal guidelines for interprofessional collaboration in stunting management at Puskesmas.

b) Incorporation of interprofessional practice requirements into Puskesmas accreditation standards.

##### 2. Education and training

a) Integration of interprofessional education modules into pre-service curricula for all health professions.

b) Provision of in-service training on collaborative practice and team-based care.

##### 3. Organizational changes

a) Implementation of regular interprofessional case conferences or team meetings at Puskesmas.

b) Development of shared electronic health records to facilitate information exchange between professionals.

##### 4. Leadership and culture

a) Promotion of a culture of collaboration through leadership training for Puskesmas heads.

b) Recognition and reward for successful interprofessional initiatives.

The role of each healthcare worker in Puskesmas requires interprofessional collaboration strategies to achieve optimal goals. This is consistent with the consensus results, where all experts (100%) stated that interprofessional collaboration would be effective for accelerating stunting reduction in Puskesmas. However, 38% of experts stated that interprofessional collaboration has not yet been established in Puskesmas. There have been three main challenges identified by the experts:

1. Policy aspect: There is currently no policy regulating the roles of various professions for accelerating stunting reduction.

2. Management aspects: These include a lack of interprofessional collaboration mechanisms, absence of collaboration operational standards, absence of a general activity plan for interprofessional collaboration in stunting management at the primary healthcare level, healthcare professionals still working independently, lack of collaboration and integration regarding the roles and functions of each healthcare worker, and lack of common understanding among healthcare workers regarding interprofessional collaboration.

3. Workload aspect of healthcare professionals: It involves a lack of human resources in Puskesmas, and the tasks and functions of each healthcare professional extending beyond nutrition issues.

To address these challenges, the initiation of interprofessional collaboration guidelines can serve as the initial step to unravel the problems and accelerate efforts to reduce stunting in Puskesmas. Furthermore, experts have also reached an agreement on efforts to enhance interprofessional collaboration strategies.

The aspects and strategies for stunting management at Puskesmas are depicted in Table 3. Experts agree that the management function of Puskesmas is crucial, with 88% of experts stating the need for leadership from the head of the Puskesmas. In terms of the organizational realm, 78% of experts have stated the need for agreement on the roles of each healthcare worker in accelerating stunting reduction management in Puskesmas. Technically, 75% of experts have agreed that there is a need for coordination processes and regular meetings. To optimize capacity and ensure sustainable understanding alignment, 72% of experts have stated the need for periodic training involving collaboration among healthcare professionals.



**Table 3. The aspects and strategies for stunting management at Puskesmas.**

No.	Aspects	Strategy
1.	Management	Leadership from the head of the primary healthcare
2.	Organization	Agreement on the roles of each healthcare professional in accelerating the reduction of stunting at the primary healthcare level
3.	Technical	Regular coordination processes and meetings
4.	Human resources	Periodic training involving collaboration among healthcare professionals
5.	Human resources	Guidance from professional organizations
6.	Human resources	Interprofessional collaboration needs to be included as a component in the job assignments of employees at the primary healthcare level
7.	Management	Establishment of clear reference mechanisms for collaboration
8.	Human resources	Requirements for interprofessional collaboration in continuing professional development units

Internalization among healthcare workers can also be achieved with guidance from professional organizations, accounting for a 69% consensus among experts. Furthermore, to enhance the commitment of each healthcare worker, 63% of experts have also agreed that interprofessional collaboration needs to be included as a component in the job assignments of employees in primary healthcare, and clear reference mechanisms for collaboration need to be provided. If necessary for organizational reinforcement, 59% of experts have stated the need for interprofessional collaboration requirements in the professional credit unit.

#### 4.5. The Urgency and Support for the Initiation of Guidelines

Consensus 5: Guidelines are needed as a reference for interprofessional collaboration in Puskesmas.

The initiation of guidelines has been supported by all experts (100%), with 81% of experts stating that the initiation of guidelines is very important and 19% of other experts stating it as important. Experts have strongly supported the initiative to develop interprofessional collaboration guidelines for stunting management in primary healthcare (Puskesmas) due to several critical factors. Primarily, they have recognized that stunting's causes are complex and multifactorial, involving poor maternal nutrition, inadequate infant and young child feeding practices, frequent infections, poor sanitation and hygiene, and limited access to quality healthcare [56]. This complexity necessitates a multisectoral approach, as no single intervention or profession can effectively address all these determinants. The prevention and management of stunting require coordinated efforts across multiple sectors, such as health, agriculture, education, water and sanitation, and social protection [17].

The diverse aspects of stunting prevention and treatment demand expertise from various healthcare professionals, including doctors, nurses, nutritionists, midwives, and public health specialists [57]. Interprofessional collaboration has been shown to improve health outcomes, particularly for complex health issues, like stunting [42]. The proposed guidelines can help delineate roles and foster this crucial collaboration. Moreover, these guidelines could serve as a common reference, ensuring that all healthcare workers have a standardized understanding of stunting management. This

standardization is vital for providing consistent, high-quality care across different Puskesmas [36].

By promoting comprehensive, collaborative management of stunting, these guidelines can contribute significantly to accelerating stunting reduction efforts at the primary healthcare level. This acceleration is crucial for achieving national targets set by the Indonesian government [58]. In essence, the experts recognize that interprofessional collaboration guidelines can serve as a vital tool in addressing the complex challenge of stunting by promoting coordinated, comprehensive care at the primary healthcare level. These guidelines can enable Puskesmas to contribute more effectively to the national goal of accelerating stunting reduction through successful comprehensive management.

Based on the guideline content, 88% of experts have stated that components for strengthening interprofessional collaboration and collaboration in the stunting management flow are necessary. The stunting management flow is also deemed suitable according to 53% of expert consensus. Furthermore, the guidelines need to include the roles of each healthcare worker, as agreed by 78% of expert consensus. To illustrate the importance of the guidelines, rationalization and introduction components also need to be included, according to 72% of expert consensus. Additionally, explanations regarding the pathways and multifactorial determinants of stunting need to be provided in the guidelines to ensure that every healthcare worker has a consistent understanding.

To implement the guidelines, three effective steps have been identified according to expert consensus. The first step has been suggested to involve socializing the guidelines to the heads of primary healthcare, which has accounted for 94% consensus among experts. Subsequently, it has been stated that there should be socialization among each professional organization involved in accelerating stunting reduction management, followed by the organization of interprofessional collaboration training for relevant healthcare workers, accounting for 91% consensus among the experts.

## CONCLUSION

The persistent challenge of stunting in Indonesia, despite numerous interventions and policies, underscores

the critical need for a more effective, coordinated approach to stunting management at the primary healthcare level. This mini-review has highlighted several key issues:

1. Multifactorial nature: Stunting is a complex issue driven by various factors, including nutritional inadequacies, recurring childhood infections, and socio-economic determinants.

2. National commitment: The Indonesian government has prioritized stunting reduction, as evidenced by its inclusion in the National Medium-term Development Plan 2020-2024 and the issuance of Presidential Regulation Number 72 of 2021.

3. Role of Puskesmas: Primary healthcare facilities (Puskesmas) play a crucial role in implementing specific interventions for stunting management, as outlined in Minister of Health Decree Number 1928 of 2022.

4. Interprofessional collaboration: The expert consensus has highlighted the importance of interprofessional collaboration in effectively managing stunting at the Puskesmas level.

5. Healthcare professional involvement: The consensus has identified key healthcare professionals involved in stunting management, including doctors, nutritionists, nurses, midwives, and public health specialists, each with specific roles and responsibilities.

The expert consensus process outlined in this review represents a crucial step towards addressing these challenges. By bringing together diverse perspectives from across the healthcare spectrum, we have identified key areas for improvement and proposed strategies to enhance interprofessional collaboration in stunting management. Moving forward, the following steps are critical:

1. Guideline development: Finalizing and disseminating comprehensive guidelines for interprofessional collaboration in stunting management at Puskesmas, as supported by 100% of the expert panel.

2. Implementation strategies: Socializing the guidelines to Puskesmas leadership and professional organizations, followed by organizing interprofessional collaboration training for relevant healthcare workers.

3. Focus on life cycle approach: Emphasizing interventions that focus on the life cycle, especially during the first 1000 days of life, as agreed upon in the expert consensus.

4. Strengthening Puskesmas' role: Enhancing the capacity of Puskesmas to implement the five pillars of the national strategy for accelerating stunting reduction, including leadership commitment, cross-sector collaboration, and robust monitoring systems.

5. Addressing collaboration barriers: Implementing strategies to overcome identified barriers to interprofessional collaboration, including policy development, education and training, organizational changes, and fostering a collaborative culture.

By addressing the gaps in current practice and fostering more effective interprofessional collaboration, we can significantly enhance the capacity of Puskesmas to manage and prevent stunting. This, in turn, could contribute to accelerating progress towards Indonesia's national stunting reduction goals and improving the health outcomes of millions of children across the country.

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R.S., T.S.: Study conception and design; I.Y.: Data collection; K.K., F.M.: Analysis and interpretation of results; R.B., B.M.: Drafting of the manuscript; D.R.: Conceptualization: DR.

#### ABBREVIATION

IPC = Interprofessional collaboration

#### CONSENT FOR PUBLICATION

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#### CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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