



## APPROACH PATTERN TO THE EFFECTIVENESS OF LOCAL GOVERNMENT POLICIES IN REDUCING THE PREVALENCE OF STUNTING IN CENTRAL MAMBERAMO DISTRICT BASED ON THE THEORY OF BETTY NEUMAN STUDY PHENOMENOLOGY

Saria Dewi Sartika Hutagao<sup>1</sup>, Blacius Dedi<sup>2</sup>, M. Jamaluddin<sup>3</sup>

<sup>1</sup>Nursing Study Program, Karya Husada University, Semarang, Indonesia

<sup>2</sup>Nursing Study Program, Karya Husada University, Semarang, Indonesia

<sup>3</sup>Nursing Study Program, Karya Husada University, Semarang, Indonesia

Dewisaria91@gmail.com

### Abstrak

Kemiskinan di Kabupaten Mamberamo Tengah diperparah oleh rendahnya angka kekurangan gizi harian (PoU) per kapita, yaitu hanya 26,1% dari AKG pada tahun 2023. Wilayah ini menjadi perhatian khusus karena menyumbang 35,42% dari prevalensi stunting tertinggi di antara 28 wilayah lain di Papua pada tahun yang sama. Model Sistem Neuman mendorong peran perawat dalam menjaga stabilitas sistem klien (individu, keluarga, kelompok, atau masyarakat) melalui intervensi primer, sekunder dan tersier. Penelitian ini bertujuan untuk mengeksplorasi pola pendekatan terhadap efektivitas kebijakan pemerintah daerah dan faktor pendukung serta hambatan keberhasilan program dalam mengurangi angka stunting di Kabupaten Mamberamo Tengah berdasarkan teori Betty Neuman. Penelitian ini menggunakan pendekatan kualitatif dengan tipe studi kasus atau fenomenologi terapan, yang berfokus pada pemahaman mendalam tentang pengalaman dan perspektif berbagai pemangku kepentingan (ibu hamil, ibu pasca melahirkan, ibu dengan balita stunting, perawat, dan kepala dinas) yang dipilih berdasarkan kombinasi metode purposive sampling dan snowball sampling di puskesmas Kobakma Mamberamo Tengah pada periode Juni hingga Juli 2025, dengan penentuan ukuran sampel berdasarkan saturasi data. Hasilnya, keberhasilan program ANC di Mamberamo Tengah terlihat dari peningkatan berat badan ibu hamil dan kelahiran normal. Hal ini didukung oleh pendekatan teoritis Betty Neuman dengan intervensi terstruktur (pendidikan, suplemen) untuk mencegah stunting, bersama dengan kolaborasi lintas sektor. Namun, hal ini terhambat oleh kekurangan sumber daya manusia kesehatan profesional. Strategi pemerintah yang mencakup pendidikan gizi, suplementasi zat besi, dan rehabilitasi gizi untuk balita yang mengalami stunting telah menunjukkan efektivitas dalam meningkatkan kesehatan ibu dan bayi meskipun tantangan sumber daya manusia perlu segera diatasi. Studi ini menyoroti keberhasilan program dalam meningkatkan kepatuhan ANC di kalangan ibu hamil dan hasil kelahiran yang sehat, dengan kolaborasi lintas sektor sebagai faktor kunci yang berkontribusi. Namun, sumber daya manusia (SDM) yang tidak memadai untuk tenaga profesional kesehatan diidentifikasi sebagai faktor penghambat mendesak yang perlu diatasi.

**Kata Kunci:** Teori betty neuman; Efektivitas kebijakan; Mamberamo tengah; Prevalensi stunting.

### Abstract

Poverty in Central Mamberamo Regency is exacerbated by the low daily malnutrition rate (PoU) per capita, which is only 26.1% of the AKG in 2023. This region is of particular concern because it contributed 35.42% of the highest stunting prevalence among 28 other regions in Papua in the same year. The Neuman System Model encourages the role of nurses in maintaining the stability of the client system (individual, family, group, or community) through primary, secondary, and tertiary interventions. This study aims to explore the pattern of approaches to the effectiveness of local government policies and the supporting factors and obstacles to the success of programs in reducing stunting rates in Central Mamberamo Regency based on Betty Neuman's theory. This study used a qualitative approach with a case study or applied phenomenology method, focusing on an in-depth understanding of the experiences and perspectives of various stakeholders (pregnant women, postpartum women, mothers with stunted toddlers, nurses, and heads of agencies) selected through a combination of purposive sampling and snowball sampling methods at the Kobakma Community Health Center in Central Mamberamo from June to July 2025, with sample size determined based on data saturation. The results showed that the success of the ANC program in Central Mamberamo was evident in the increase in pregnant women's weight and normal births. This is supported by Betty Neuman's theoretical approach with structured interventions (education, supplements) to prevent stunting, along with cross-sector collaboration. However, this is hampered by a shortage of professional health human resources. Government strategies, which include nutrition education, iron supplementation, and nutritional rehabilitation for stunted toddlers, have shown effectiveness in improving maternal and infant health, although human resource challenges need to be addressed urgently. This study highlights the program's success in improving ANC adherence among pregnant women and healthy birth outcomes, with cross-sector collaboration as a key contributing factor. However, inadequate human resources (HR) for health professionals was identified as an urgent inhibiting factor that needs to be addressed.

**Keywords:** Betty neuman's theory; Policy effectiveness; Central mamberamo; Prevalence of stunting

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\* Corresponding author :

Address : Semarang, Indonesia

Email : Dewisaria91@gmail.com

INTRODUCTION

Public health in Papua Province is a crucial priority for the Papua Provincial Government, the community, and academics, as a healthy population will positively contribute to the province's progress. Strong public health in Papua Province is also a key aspect of sustainable development (Ministry of National Development Planning/Bappenas, 2021). A province with healthy citizens will be able to produce productive and high-quality human resources for the province's economic and social development. Economic development is defined as an increase in total and per capita income in a province, accompanied by fundamental changes in the economic structure and income distribution. Social development, meanwhile, is a process of planned social change aimed at improving the overall welfare of the population by integrating it with dynamic economic development to achieve a better quality of life.

However, achieving ideal public health in Papua Province is not an easy task for the government, as it is currently facing the problem of malnutrition affecting a large portion of its population. This malnutrition has a significant impact on stunting. Stunting, characterized by low height for age, is a direct result of chronic malnutrition, specifically inadequate nutritional intake over a prolonged period. This insufficient nutrition, especially during childhood and during the mother's pregnancy, can stunt the child's growth, leading to stunting.

This issue is increasingly burdening the Papuan government. Over the past three years, stunting prevalence has shown a significant increase. According to data, in 2023, Papua Province recorded the highest stunting prevalence in Indonesia, with an average of 39.4%.(Safitr & Mardahlia, 2024), (Nusantara, 2024). In 2021, the prevalence was 21.36%, this figure increased by 5.11% to 26.47% prevalence in 2022, then at the end of 2023, it increased by 60% to 42.4% stunting prevalence.(Cepos, 2023) (Nurak et al., 2023).

Central Mamberamo Regency contributes the highest prevalence of stunting in Papua Province compared to the other 28 regencies in Papua Province, where 35.42 percent of the total population is recorded as being affected by poverty (Data, 2024a). Poverty in Central Mamberamo is also reinforced by the prevalence of nutritional inadequacy (Prevalence of Undernourishment/PoU) per community per day which only reached 26.1% of the AKG in 2023, this AKG amount is very low from the AKG requirements for per community per day according to the Minister of Health Regulation R.1 No.28 / 2019 concerning the Recommended

Nutritional Adequacy Rate (AKG) which must total 90-119% of the AKG per day consisting of carbohydrates around 45-65%, protein 10-20%, and fat 10-25% of total calories. This means that a large part of the community in Central Mamberamo Regency suffers from malnutrition (Data, 2024b).

Furthermore, the low level of public understanding in Central Mamberamo Regency, located in the mountains, regarding environmental health is another factor contributing to stunting. Clean and healthy living practices in the area are still difficult to achieve. Unsanitary environmental conditions, such as piled-up garbage, stagnant water, and numerous insects, can become breeding grounds for various diseases. Furthermore, poor sanitation, such as the lack of proper toilet facilities, open defecation, and poor waste management, can lead to environmental contamination and infectious diseases in children. Limited access to clean and potable water can expose children to bacteria, viruses, and parasites that cause infectious diseases. Infections caused by poor sanitation, limited access to clean water, and an unclean environment can lead to digestive and nutrient absorption disorders. If infections occur chronically, they will further increase the risk of stunting.

The welfare state theory refers to the concept that the government is responsible for ensuring the well-being of its citizens, whether through social services, assistance, protection, or the prevention of social problems. In practice, this theory focuses on the provision of public services such as education, health care, and social security, as well as free economic intervention to stabilize markets and reduce inequality (Keynes, 1965).

The next theory of nursing theory, known as the Betty Neuman nursing model, introduced two models: the Neuman Systems Model (NSM), which emphasizes the importance of nursing interventions, namely actions aimed at maintaining or restoring the stability of the client's system. Interventions can be preventive (primary, secondary, tertiary) or curative. The next model, caring, focuses on the nurse's role in providing education to individuals, families, and communities to improve client health, including prevention, adaptation, and recovery (Reed, 1993).

Nurses are a crucial factor in the success or failure of three programs to reduce stunting prevalence initiated by the Central Mamberamo regional government. Nurses in health leadership positions are actively involved in providing education to mothers and children with stunting. With their health knowledge, nurses can provide knowledge and advocacy to influence the opinions

of mothers and children with stunting and improve their healthcare.

The important role of nurses in stunting cases includes promotion, prevention, curative, and rehabilitation. Promotion can be achieved through health promotion, such as providing education and counseling. This education and counseling encompass two-way communication between nurses and mothers and children with stunting, providing insight and opening a question-and-answer session about balanced nutrition, parenting patterns, and risk factors for stunting in pregnant women and children. These activities can be combined with immunizations and routine child growth and development monitoring at integrated health posts (Posyandu) (Hastuti et al., 2024). Furthermore, preventive activities which are efforts to prevent an increase in the prevalence of stunting include immunization, routine health checks, and education about stunting (Carracedo, 2018). The third role, namely curative, is an action to treat individuals at risk of malnutrition, including children who experience stunting (Mutumba et al., 2024). Rehabilitative is a role that is of a nature, caregiver, team member, counselor, researcher and educator, the role of nurses in handling stunting is followed by activities of weighing and measuring the height of children to monitor growth and detect early stunting problems, including pregnant women who experience chronic energy deficiency (KEK). (Lee et al., 2024).

A program needs to be researched for its effectiveness because assessing the effectiveness of a policy program is not only about finding or recording the successes or failures made by workers and giving punishment for their failures (Mesiono, 2018). But the most essential thing is to eliminate the causes of failure and find solutions by helping workers to do their jobs better by paying attention to achieving goals. It also states that research related to the effectiveness of a policy program is also so that the implementation of public services can achieve results as planned, achieve the desired goals and be more effective and efficient (Maulida, 2021)

Furthermore, whether a policy program is successful or not is influenced by four important variables that need to be studied, these factors include communication, namely that the success of policy implementation requires that the implementer knows what needs to be done (Stranzl, 2024). Resources, even if the policy content has been communicated clearly and consistently, if the implementor lacks the resources to implement it, the effectiveness of implementation will be hampered. Disposition, if the implementor has a good disposition, the policy

objectives can be achieved. Bureaucratic structure, tasked with implementing the policy, consists of aspects of the organizational structure, namely Standard Operating Procedures (SOPs) and fragmentation. Focus on policy implementation can effectively achieve its objectives if implemented well because researchers can explore factors that can increase program effectiveness (Kusuma & Simanungkalit, 2022).

Effectiveness conceptually is the effort to achieve desired targets (as expected) which are aimed at many people and can be felt by the target group, namely society (Gibson et al., 2012). Effectiveness is related to the implementation of all main tasks, the achievement of objectives, timeliness, and active participation of members and is a relationship between stated objectives and results, and shows the degree of conformity between stated objectives and achieved results. Effectiveness is the state or ability of a job done by humans to provide the expected results and in accordance with the time that has been determined (Bormasa, 2022).

Regional government policy is an action that is directed towards the goals proposed by a person, group or government in a particular environment in relation to the existence of certain obstacles while seeking opportunities to achieve goals or realize desired targets (Patarai, 2020). Regional government policy as a projected program with certain goals, values, and practices) (Maulana, 2019).

The prevalence of stunting conceptually is the level or measure of growth failure in toddlers (under 5 years) in a region or country, characterized by a height that is shorter than the standard for their age, due to chronic malnutrition and repeated infections (Nuriska et al., 2024). Furthermore, stunting generally occurs due to toddlers lacking essential nutrients such as animal and vegetable protein and iron. This nutritional deficiency can occur while the baby is still in the womb because the mother does not receive adequate nutrition during pregnancy (Nurdiansyah et al., 2024).

The effectiveness of local government policies in reducing the prevalence of stunting has been studied previously by predecessors, but previous researchers only focused on discussing the extent to which government policy programs achieved their targets in reducing the prevalence of stunting, so that the factors causing reducing the prevalence of stunting are still the task of the government and academics. Ardella & Ariyanto (2025), Riyadh et al. (2022), Ali & Samosir (2023), Sururi et al. (2023), Muharram (2024), Manangsang et al. (2024), Norsanti (2021), Suprpto et al. (2023), Dewi et al. (2024), Zahran et al. (2024).



The factors that support and hinder the success of a policy program need to be explored in depth to optimize its effectiveness and accountability to constituents. (Pramono, 2020). Essentially, assessing a program's effectiveness will be useless without information on the factors that hinder and enhance a policy program, as the essence of effectiveness is to improve program implementation. These factors provide continuous feedback to improve planning, standard operating procedures, resource utilization, and program implementation progress (Akbar, 2018).

This state-of-the-art study will explore both the inhibiting and contributing factors to the decline in the effectiveness of government policy programs in reducing stunting prevalence. This study aims to explore the effectiveness of local government policy approaches and the factors that support and hinder the success of programs in reducing stunting prevalence in Central Mamberamo Regency, based on Betty Neuman's theory.

Based on the explanation that the researcher has conveyed, the title of this research is "Patterns of Effectiveness of Regional Government Policy Approaches in Reducing the Prevalence of Stunting in Central Mamberamo Regency Based on Betty Neuman's Theory".

METHOD

This type of research is qualitative research, where the selection of qualitative research design is based on the researcher's motivation to clearly reveal the effectiveness of local government policies in reducing the prevalence of stunting in Central Mamberamo Regency.

This research was conducted in Central Mamberamo Regency due to the increasing prevalence of stunting despite the implementation of the Healthy Living, Safe Food Awareness Community Movement (Germas SAPA) program, which ran from June to July 2025.

The population in this study was the team actively involved in stunting reduction in Central Mamberamo Regency in 2025. The sample included prenatal mothers, postnatal mothers, mothers with stunted toddlers, nurses, and the involved Chamber of Commerce and Industry (Kadin). The sample size was determined based on saturation (data saturation obtained by the researcher). The sampling techniques used were purposive sampling and snowballing. Purposive sampling involves selecting samples based on specific considerations by the researcher, while snowballing involves requesting recommendations from previous respondents/informants for subsequent respondents/informants. Inclusion criteria

included teams active or effective in stunting reduction activities in Central Mamberamo Regency.

The data collection technique in this study was carried out through the interview method. Interviews are a tool for rechecking or verifying information or statements previously obtained. The interview technique used in qualitative research is an in-depth interview. An in-depth interview is the process of obtaining information for research purposes by means of a face-to-face question and answer session between the interviewer and the informant or interviewee (Hardani et al., 2020).

An in-depth interview is an interaction or conversation that occurs between an interviewer and an informant in the process of obtaining information for research purposes. In-depth interviews generally use open-ended questions to explore a topic (problem) in depth (Sulistyawati, 2018).

Braun & Clarke's thematic analysis data analysis techniques: 1) Identifying interesting data features and grouping them into initial codes. 2) Grouping similar codes to form potential themes. 3) Examining themes to ensure their relevance and accuracy to the data. 4) Defining and naming themes. 5) Writing a report describing the researcher's findings and interpretations (Braun & Clarke, 2006).

RESULTS AND DISCUSSION

Theme 1: Participant ANC compliance, prenatal nutritional growth and postnatal intervention outcomes, and toddler healthy behaviors

Participants in this study stated that the Genting program successfully improved maternal prenatal ANC compliance through education, maternal prenatal nutritional growth and postnatal outcomes through the provision of balanced nutritious food and iron and IFA supplementation, and toddler healthy behaviors through the provision of additional food for stunted toddlers.

ANC compliance response

In-depth interviews with ten participants revealed data indicating improved ANC compliance. This was supported by interviews in which seven participants explained that they had increased knowledge about the dangers of stunting by conducting early risk detection and monitoring fetal growth and development during pregnancy. (P1): "Education on the dangers of stunting in pregnant women and an understanding of the 1000 Days of Life (HPK) has made it easier for the public to understand the dangers of stunting. This is demonstrated by the presence of pregnant women who diligently attend regular monthly antenatal care (ANC) check-ups."

(P2): "This education is becoming more popular because more and more people are attending integrated health posts (Posyandu) and monthly ANC visits."

(IH2): "I regularly attend the Posyandu. I used to be lazy, but because stunting is dangerous for my child's future, I continue to attend the ANC visits as scheduled."

(IH.3): "I attend ANC visits as scheduled. I am currently 4 months pregnant and have reduced my field activities and regularly monitor fetal changes to maintain my pregnancy, following the midwife's advice."

(K.IHS.4): "I always remind my wife to attend ANC visits according to the schedule after attending educational activities, because I also enjoy watching the fetus' growth."

(K.IH.5): "I have warned my wife to get enough rest and continue attending ANC visits as scheduled, and I take her to the hospital." Posyandu".

**Prenatal Nutritional Growth Response and Postnatal Intervention Results**

In-depth interviews with ten participants revealed that participants experienced nutritional growth, mothers experienced weight gain during prenatal periods, and then had normal low birth weight (LBW) babies postnatally. This was supported by interviews where four participants successfully explained that they experienced weight gain and had normal low birth weight babies. (P2): "We provide additional food assistance and IFA and iron supplements to pregnant women. These foods meet balanced and adequate nutritional needs. Monitoring so far shows a low birth weight (LBW) of 2.7 kg."

(P3): "Yes, additional food assistance and IFA and iron supplements are tailored to the needs of the target group to support this critical program. During birth monitoring, many mothers had a low birth weight (LBW) of 2.6 kg-3 kg."

(IM.1): "As a pregnant woman, additional foods such as rice with chicken and beef, milk, eggs, and fruit have increased my weight. My low birth weight is also 2.8 kg."

(IM.2): "Yes, I experienced weight gain after receiving food assistance and IFA and iron supplements during pregnancy. After giving birth, my baby weighed 2.8 kg. I hope the government continues this program."

**Healthy Behavior Responses for Stunted Toddlers**

In-depth interviews with ten participants revealed that the participating toddlers experienced behavioral changes characterized by changes in appetite, increased activity, and Stunted toddlers experience weight gain. This is supported by interview results, where four participants

successfully explained that their toddlers behave healthily.

(P1): "Supplementary food is available for toddlers. The food is guaranteed to be nutritious and hygienic. During monitoring at the integrated health post (Posyandu), many stunted children experienced weight gain."

(P4): "Stunted toddlers have been given supplementary food. Based on records in the KIA (Child Health Card), the weight gain of stunted children has almost reached 50%."

(IBS.3): "Changes after being given supplementary food: my child has a good appetite and is more active, constantly asking questions about new things he sees. My child is 4 years old."

(IBS 5): "Supplemental food is generally delivered to the home. Changes in the child: Currently, the child is gaining weight."

**Theme 2: Participants lack medical personnel and complete equipment**

Participants in this study stated that the obstacle they faced was a lack of medical personnel, while a supporting factor was complete medical equipment.

**Cross-sectoral government collaboration response.**

In-depth interviews with ten participants revealed that they acknowledged that cross-sectoral government collaboration plays a crucial role in the effectiveness of stunting management. This is supported by interviews where four participants explained that they accessed health services.

(P3): "This collaboration aims to address budget inefficiencies, providing experts with appropriate professionalism to conduct education rather than incurring high costs."

(P5) "Stunting isn't just about nutrition, but also non-nutritional factors, so collaboration with various government agencies streamlines the implementation of critical programs. Non-nutritional aspects include access to clean water, a livable environment, and health education. This collaboration facilitates providing assistance tailored to the needs of stunting sufferers."

(IH.4): "The assistance includes not only supplementary food and free checkups for pregnant women, but also assistance with building latrines. One has already been built in our village."

(K.IH): "Latrines are being built in the village, with one per village."

**Response to lack of medical personnel**

In-depth interviews with ten participants revealed that participants acknowledged the program's biggest obstacle was a lack of medical personnel. This was supported by interviews where three participants successfully explained that the lack of

medical personnel was the main obstacle to managing stunting.

(P1); *"There's a shortage of medical personnel in Central Mamberamo who aren't suited to the needs of stunting sufferers, so nurses have to work extra hard."*

(P4) *"The shortage of medical personnel is the main obstacle because this area is also prone to conflict with the KKB (Community Armed Forces) for midwives from outside the area."*

(P50) *"Medical personnel recruited from outside the area often don't stay long because this location is remote."*

**Discussion**

**Participants' ANC compliance, prenatal nutritional growth, postnatal intervention outcomes and healthy behaviors in stunted toddlers**

Participants in this study reported the effectiveness of the critical program through ANC interventions conducted by medical personnel. This program successfully increased maternal prenatal ANC compliance, weight gain through the provision of balanced nutritious food in nutritional interventions, and normal low birth weight (LBW) levels from IFA and Iron. In accordance with Neuman's theory (Betty Neuman's Systems Model), antenatal care (ANC) interventions through structured and ongoing education can prevent stunting, while supplemental feeding and iron supplements, along with IFA, can reduce the impact of stunting. Providing additional food and vitamins to stunted toddlers can restore, maintain, and balance their condition.

The study results indicate that Antenatal Care (ANC) interventions through structured and ongoing education are crucial, especially for at-risk mothers, such as those with stunting, because they increase knowledge, change attitudes, and improve pregnant women's behaviors (e.g., nutrition and safe delivery), thereby increasing ANC visits and maternal-child health outcomes. They also prevent stunting early through understanding nutrition during the First 1,000 Days of Life (HPK) and optimal health practices (Muhamad et al., 2023). The results of the study showed that mothers who understand the importance of routine pregnancy monitoring, danger signs, and health interventions are more likely to schedule and attend regular ANC visits. Consistent ANC visits allow for early detection and management of pregnancy complications, which directly improve maternal and fetal health (Tanberika et al., 2024). Pregnancy education interventions are very effective in increasing pregnant women's knowledge and ANC compliance, encouraging higher participation of

pregnant women to achieve ANC coverage targets, by involving mothers, academics, and health workers. The result is increased maternal awareness of the importance of routine check-ups, pregnancy danger signs, and nutrition, which accelerates the detection of complications and helps reduce maternal and child mortality rates. This suggests that education-based interventions are key to improving maternal and child health (Astutik et al., 2025).

The results of the study showed that nutritional interventions that can be used to prevent stunting for prenatal mothers are additional food in the form of supplements or foods containing micronutrients and macronutrients. Foods rich in macronutrients (carbohydrates, proteins, fats) and micronutrients (vitamins, minerals) are whole and diverse foods such as eggs, lean meat, fish (salmon), dairy products, nuts (almonds, cashews), and various fruits and vegetables, which naturally contain a combination of nutrients important for energy and body function (Manoppo & Huriah, 2022),(Setiawan & Devi, 2024). The results of the study showed that iron and folic acid (IFA) supplementation is very important and has been proven effective in reducing maternal anemia, low birth weight babies, and birth defects (Hutajulu & Ditaelis, 2025).The results of the study showed that the use of Iron and Folic Acid (IFA) Supplements by pregnant women, especially starting in the first 4 months, is closely related to a reduced risk of stunting, severe stunting, and small birth size, as well as an increase in LAZ (Length-for-Age Z-score) in children. This suggests that early and sustained IFA supplementation is an important strategy for improving child growth, particularly in areas with high iron deficiency (Nisar et al., 2020). The study showed that providing additional nutrition through supplements such as iron, folic acid, zinc, various micronutrients, LNS, and nutrient-rich foods to pregnant women is a key strategy for preventing stunting in children by improving maternal nutrition and fetal growth, particularly in the crucial first 1,000 days. This intervention addresses macronutrient (protein, energy) and micronutrient (vitamins, minerals) deficiencies that influence healthy infant development from conception, reducing risks such as low birth weight and stunting (Dewey, 2016),(Black et al., 2015). The analysis showed a significant relationship between maternal nutritional status and the incidence of stunting in children. Pregnant women with good nutritional status have a lower risk of giving birth to stunted children compared to pregnant women who are malnourished (Tyarini et al., 2025).



The results of the study showed a significant positive relationship between providing recovery supplementary feeding and increased height in stunted toddlers (Lutfitasari et al., 2025),(Goudet et al., 2019).The results showed that supplementary feeding programs based on local food ingredients are effective in improving the nutritional status of toddlers, particularly in reducing the prevalence of stunting and underweight. These programs support the principles of dietary diversity, balanced nutrition, and food safety. Several studies reported improvements in anthropometric indicators such as weight-for-age and height-for-age after consistent provision of supplementary feeding sourced from local ingredients, such as fortified snacks, modified traditional foods, and nutrient-enriched complementary foods (Nur & Samsul, 2025).

In accordance with Neuman's theory (Betty Neuman's Systems Model), an integrated public health approach that combines specific nutrition interventions such as supplementation and nutrition-sensitive interventions such as education is crucial for better pregnancy outcomes (Hutajulu & Ditaelis, 2025). The integration of ANC interventions, nutrition interventions, and supplementary feeding in toddlers has reduced stunting. Effective interventions improve the knowledge, attitudes, and practices of pregnant women regarding prenatal care and nutrition, which have a positive impact on the timing of delivery. and underlined the importance of improving education and behavior of pregnant women (especially those at risk of short stature) to prevent stunting through better understanding of ANC and nutrition (Muhamad et al., 2023).

**Participants cross-sectoral government collaboration and a shortage of medical personnel**

Participants in this study stated that the effectiveness of the Germas SAPA program is strongly supported by a collaborative governance approach. This collaboration is crucial because addressing stunting requires cross-sectoral cooperation involving various stakeholders beyond the government. Meanwhile, the inadequate number of healthcare professionals meeting the needs of stunting sufferers was a pressing obstacle identified in the respondent data. The research findings indicate that the key to successful stunting reduction is collaboration between stakeholders and the crucial role of social capital (networks, norms, trust) in strengthening interventions (Astuti et al., 2025). The research findings reinforce that the penta-helix collaborative governance model (government, entrepreneurs, academics, civil society, and the

mass media) is an effective solution to address stunting, as these five elements can synergize to achieve optimal results in stunting prevention and reduction, with the government acting as the primary coordinator integrating all parties for joint action(Ibrahim et al., 2024).The research findings indicate that bridging formal governance structures (government, official institutions) with informal networks (local communities, non-governmental organizations) is crucial for effective stunting prevention(Supranoto et al., 2025).

The research findings demonstrate that the lack of health workers, especially in remote and rural areas, hinders effective stunting prevention and management efforts, such as the inadequate number of nurses for the number of stunting sufferers(Bukit et al., 2021). Research shows that the shortage of trained health workers is a serious problem. Training and increasing the number of health workers must be a priority to ensure that all areas, especially remote ones, have access to quality health services (Manangsang et al., 2024)

**CONCLUSION**

Research participants reported the program's success in improving ANC attendance for pregnant women, resulting in increased maternal weight gain and normal birth weight in infants. The approach to the effectiveness of local government policies in reducing stunting prevalence in Central Mamberamo Regency, based on Betty Neuman's theory, was implemented through three interventions. First, antenatal care (ANC) interventions through structured and ongoing education serve as a line of defense to prevent fetal stunting. Second, supplementary feeding, iron supplements, and IFA serve as secondary interventions to mitigate the potential impact of stunting. Third, recovery and balance, providing supplementary feeding and vitamins to stunted toddlers serves to restore, maintain, and balance their health.

Cross-sectoral government collaboration is a key supporting factor in the effectiveness of the Germas SAPA program, as stunting management requires cross-sectoral cooperation. However, the inadequate number of professional health human resources (HR) to address the needs of stunting sufferers was identified as an urgent obstacle in the respondent data.

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