



Understanding and the Role of Health Students in Stunting Prevention in Nabire District

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ABSTRACT

This study explores in depth the understanding and role of health students in stunting prevention in Nabire District, Central Papua, which has a stunting prevalence of 22.2%, exceeding the national average. Using a qualitative phenomenological approach, research data were collected through in-depth interviews, observations, and documentation. Data analysis used source triangulation. The results indicate that health students have a fairly comprehensive understanding of stunting. Their role in stunting prevention is manifested through community education activities, counseling for pregnant women and infants, nutrition counseling, demonstrations of nutritious food preparation, and participation in fieldwork programs. Challenges faced by students include low self-confidence, uncooperative community responses, difficulty accessing stunting data, and limited awareness of the importance of effective communication. Health students have great potential as agents of change in stunting prevention, provided they receive support, including closer collaboration between educational institutions, the government, and the community to create a stunting prevention ecosystem.

INTRODUCTION

Stunting is a manifestation of chronic malnutrition that occurs during critical periods of growth and development in children, particularly during the first 1000 days of life, starting from pregnancy until the child is two years old. This condition is not only characterized by shorter stature compared to age-specific standards according to the World Health Organization's growth charts but also reflects more complex disruptions in children's biological and neurocognitive systems, which will have long-term impacts on their quality of life and productivity in the future (WHO, 2021).

The complexity of the stunting problem in Indonesia is reflected in data from the 2022 Indonesia Nutrition Status Survey, which shows a national prevalence of 21.6%, a figure that is still far from the target of the National Medium-Term Development Plan 2024 of 14% (Ministry of Health of the Republic of Indonesia, 2022). This situation is even more concerning when viewed from a regional perspective, where Central Papua Province shows a significantly higher prevalence rate of 39.4%, while Nabire Regency specifically has a stunting prevalence rate of 22.2% based on the 2023 Indonesia Health Survey (Ministry of Health of the Republic of Indonesia, 2023). These geographical disparities indicate the presence of contextual factors influencing stunting incidence, including access to nutritious food, quality of healthcare services, community education levels, environmental sanitation conditions, and varying socioeconomic factors across regions.

The impacts of stunting are not limited to physical aspects alone but have far-reaching implications for cognitive development, immune system function, learning ability, economic productivity, and overall human resource quality (Black et al., 2013). Children who experience stunting are at risk of motor and cognitive developmental delays, reduced academic ability, increased susceptibility to infectious diseases, and in the long term, it can affect their productive and economic capacity when they reach adulthood (Victora et al., 2016). Therefore, stunting prevention is not only a health issue but also a strategic investment in sustainable human resource development.

Nabire Regency, as one of the districts in Central Papua, faces multidimensional challenges in its efforts to prevent stunting, including limited access to nutritious and diverse food, inadequate health service infrastructure, low public awareness of the importance of proper child care, limited access to accurate health information, and socio-economic conditions that still require special attention (Papua Health Office, 2023). The complexity of these issues requires a holistic approach involving various stakeholders, including professional health workers, local governments, civil society organizations, and health students who have great potential to contribute to stunting prevention efforts through a community-based approach.

Health students, as future health professionals, hold a strategic position in the stunting prevention ecosystem because they not only possess theoretical knowledge about health and nutrition but also have access and proximity to the community through various academic programs such as fieldwork, community service, and community engagement activities (Sari et al., 2021). Student

involvement in stunting prevention efforts can make a significant contribution through community education, health counseling, family counseling, community-based research, and policy advocacy that supports improvements in children's nutritional status.

Health students' understanding of stunting is a crucial foundation in shaping their attitudes, readiness, and effectiveness in supporting stunting prevention programs in the community. Previous research indicates that students with comprehensive knowledge about nutrition and stunting tend to be more proactive and effective in educating the community and are better able to identify and respond to stunting risk factors (Rahayu et al., 2022). However, other studies reveal that there are still gaps in health students' understanding of the multifactorial causes of stunting, comprehensive prevention strategies, and evidence-based and contextual intervention approaches (Setyawan & Indriani, 2020).

In Nabire District, there has been little systematic research exploring the level of understanding of health students on stunting issues and analyzing their contribution to prevention efforts. However, a deep understanding of the capacities, potential, and constraints faced by health students is crucial for designing effective empowerment strategies and optimizing their role in community-based stunting prevention programs. This study is relevant in the context of developing more responsive health education policies and designing collaborative programs between health higher education institutions, local governments, and communities.

THEORETICAL REVIEW

The Concept of Stunting in Public Health Perspective

Stunting, according to the World Health Organization, is a condition in which a child's height for age is more than two standard deviations below the median of the internationally established standard growth (WHO, 2021). However, contemporary understanding of stunting has evolved beyond this simple anthropometric definition to encompass the complexity of factors contributing to linear growth impairment that reflects chronic and cumulative malnutrition. The causes of stunting are multifactorial and interrelated, including direct factors such as inadequate nutrition and recurrent infections, indirect factors such as household food security, child-rearing practices, access to health services, and underlying factors such as socioeconomic conditions, education, and the environment (UNICEF, 2022).

The critical period for stunting is the first 1,000 days of life, starting from conception until the child is 24 months old, during which rapid growth and development occur in the nervous system, internal organs, and physical structure of the child. Nutritional deficiencies during this period can cause permanent damage to brain structure and function, the immune system, and other vital organs, which cannot be fully reversed even if nutritional status is improved later in life. Therefore, stunting prevention interventions must begin during the preconception period, continue throughout pregnancy, childbirth, and the

exclusive breastfeeding period, as well as the introduction of appropriate complementary foods.

The impacts of stunting are not limited to physical growth but have significant long-term consequences for cognitive development, learning ability, academic achievement, economic productivity, and overall quality of life (Black et al., 2013). Children who experience stunting are at risk of delayed fine and gross motor development, reduced cognitive and memory abilities, difficulties in concentration and problem solving, and increased vulnerability to infectious and non-communicable diseases in adulthood (Victora et al., 2016). From a macroeconomic perspective, high stunting prevalence can reduce labor productivity, increase the burden on the health system, and hinder a country's economic growth.

The Strategic Role of Health Students in Stunting Prevention

Health students have a unique and strategic position in the stunting prevention ecosystem because they are at the intersection of the academic world and field practice, have access to the latest scientific knowledge, and are close to the community through various education and community service programs.

Based on the Health Promotion Model developed by Pender (2011), individuals with a comprehensive understanding of a health issue are more likely to actively participate in health interventions and promotion. In the context of stunting prevention, health students with in-depth knowledge of the causes, pathophysiological mechanisms, and prevention strategies for stunting are expected to become effective agents of change in educating the community and supporting community-based intervention programs.

The contribution of health students in stunting prevention can be realized through various modalities, including health education and counseling for target groups such as pregnant women, breastfeeding mothers, and families with young children; community-based research to identify local factors contributing to stunting; development and implementation of nutrition intervention programs tailored to the conditions and needs of the local community; advocacy for policies supporting improvements in children's nutritional status; and community empowerment to develop local capacity in stunting prevention. Research conducted by Prasetyo & Lestari (2020) shows that health students involved in stunting prevention programs were able to increase the knowledge and awareness of pregnant women and toddlers about the importance of healthy eating patterns and child-rearing practices that support optimal child growth.

However, student involvement in stunting prevention programs often faces various obstacles and challenges, including limited training and capacity building, lack of support from educational institutions, limited access to necessary resources and facilities, and minimal coordination with other stakeholders such as local governments, community organizations, and the private sector (Yulianti & Wahyudi, 2023). Research by Yulianti & Wahyudi shows that support from educational institutions is a key factor in increasing the effectiveness of student involvement in stunting prevention programs.

Factors Affecting Students' Understanding and Involvement

The level of health students' understanding of stunting and the quality of their involvement in prevention efforts is influenced by various interacting factors. First, their educational background and curriculum greatly determine the depth and comprehensiveness of their knowledge about nutrition, maternal and child health, and social determinants of health related to stunting (Rahmawati, 2019). Students who have taken comprehensive courses in nutrition and public health tend to have a better understanding of the complexity of stunting issues and the multisectoral strategies for its prevention.

Second, exposure to information and practical experiences through activities such as seminars, workshops, training, fieldwork, and real-world lectures significantly contributes to forming a deeper and more contextual understanding of stunting (Nugroho et al., 2022). Research by Nugroho et al. shows that students who receive special training on stunting have better levels of understanding and skills compared to students who only receive theoretical material. This indicates the importance of experience-based and practical learning in developing students' competencies to contribute to stunting prevention.

Third, institutional support in the form of community service programs, research facilities, guidance from lecturers, and partnerships with other institutions can increase students' motivation and capacity to actively participate in stunting prevention programs. Institutions with a strong commitment to developing students' capacity in public health tend to produce graduates who are better prepared and more competent in addressing public health challenges, including stunting.

Fourth, student access to communities and opportunities to interact directly with target communities play an important role in developing their ability to apply theoretical knowledge in practical contexts (Prasetyo & Lestari, 2020). Students who have the opportunity to be involved in community-based programs will have a more realistic understanding of the challenges and complexities of implementing stunting prevention programs in the field.

Challenges and Strategies for Enhancing the Role of Students

The implementation of the role of health students in stunting prevention faces various challenges that require a strategic and comprehensive approach to overcome them. The main challenges often identified include a lack of coordination between educational institutions and health agencies and local governments, limited financial and technical resources to support field activities, minimal opportunities to be directly involved in sustainable intervention programs, and a gap between the theoretical knowledge gained in the classroom and the complex realities faced in the field (Yulianti & Wahyudi, 2023).

To address these challenges, a development strategy is needed that includes improving the quality and relevance of health education curricula by integrating stunting issues more comprehensively; conducting training and workshops focused on developing communication skills, health education, and community-based program management; developing strategic partnerships between educational institutions, local governments, non-governmental organizations, and

the private sector to create an ecosystem that supports student involvement; and providing platforms and mechanisms that facilitate students to contribute sustainably to stunting prevention programs.

METHODOLOGY

This study used a qualitative approach with a phenomenological design that aimed to explore and understand in depth the life experiences of health students in the context of their understanding and role in stunting prevention in Nabire District. The phenomenological approach was chosen for its ability to explore the subjective meaning and essence of individual experiences, thereby providing comprehensive insights into how health students understand, interpret, and respond to stunting issues in the local social and cultural context of Nabire District (Creswell, 2018).

The research location was set at the Nabire Health College, which includes the Nursing and Midwifery Study Program of the Jayapura Ministry of Health Polytechnic Nabire Class and the Nutrition Study Program of STIKES Persada Nabire. This location was chosen based on strategic considerations that these three institutions are the main centers of health education in Nabire District, offering academic programs and field practice activities related to public health and stunting prevention. The research was conducted from March 25 to April 12, 2025, taking into account academic schedules and the availability of informants to participate in the study.

Research informants were selected using purposive sampling techniques with pre-established criteria to ensure the quality and relevance of the data obtained. A total of 10 informants were selected, consisting of 3 health students from various study programs (Nursing, Midwifery, and Nutrition) who have experience in field practice or community service activities; 3 lecturers with expertise in nutrition, public health, nursing, and midwifery, with experience in teaching and supervising students in academic activities and field practice; 2 health workers from community health centers involved in stunting prevention programs at the primary care level and who frequently interact with students in the context of field work or collaborative activities; 1 community health worker active in posyandu activities and health programs at the community level; and 1 parent of a toddler who has interacted with health students in the context of education or health programs. This diverse composition of informants is intended to obtain multiple and comprehensive perspectives on the phenomenon being studied.

Data collection techniques in this study use triangulation methods consisting of in-depth interviews, participatory observation, and documentation. In-depth interviews were conducted using semi-structured interview guidelines developed based on literature review and research objectives, with a duration of approximately 45-60 minutes for each interview session. Participatory observation was conducted to observe student activities in educational and stunting prevention intervention activities in the community, including how they interacted with the community, the methods of information delivery, and the community's response to these activities. Documentation was carried out

through the collection of secondary data in the form of journals, academic reports, policy documents, educational materials used by students, as well as photo and video documentation of relevant activities with the consent of the informants.

Data analysis in this study uses an inductive approach with the Miles and Huberman analysis framework, which consists of three main stages: data reduction, data presentation, and conclusion drawing with verification (Miles et al., 2014). The data reduction stage involves the process of selecting, simplifying, abstracting, and transforming raw data obtained from the field, where irrelevant or inconsistent data is eliminated, while important data is categorized and coded according to emerging themes. The data presentation stage is carried out by organizing and compressing the reduced information into descriptive narratives, matrices, diagrams, or tables that make it easier for researchers to identify patterns, relationships between themes, and develop in-depth interpretations. The conclusion and verification stage involves interpreting findings based on patterns found in the data, both those that support and those that contradict existing theories, through continuous verification using triangulation of sources and member checking.

To ensure the validity and reliability of the research results, source triangulation is carried out by comparing data obtained from various informants (students, lecturers, health workers, cadres, and parents), method triangulation by combining interviews, observations, and documentation, and time triangulation by collecting data at different times and contexts to ensure consistency of findings. In addition, member checking was also carried out by returning the analysis results to the informants to verify the accuracy of the researchers' interpretations and ensure that the research findings truly reflect the experiences and perspectives of the informants.

RESEARCH RESULTS

Characteristics of the Research Location and Informants

This study was conducted at three major health higher education institutions in Nabire District that play a strategic role in preparing future health workers for the Central Papua region. The D-3 Nursing Program in Nabire, which is part of the Jayapura Ministry of Health Polytechnic, is located at Jalan Samratulangi No. 93 Oyehe and has a vision to become a professional, independent, competitive, and authoritative health workforce education institution with a special focus on HIV/AIDS, tuberculosis, and malaria management. The program currently has 188 active students in the second semester of the 2024/2025 academic year, supported by 11 faculty members and various learning facilities.

The D-3 Midwifery Program in Nabire, located at Jalan Padat Karya Kampung Sanoba, has a mission to produce midwifery professionals capable of providing comprehensive midwifery care with specialization in HIV/AIDS, tuberculosis, and malaria cases. This program has 129 active students, supported by 9 full-time lecturers and 4 part-time lecturers, along with 5 educational laboratory technicians and 4 educational staff. Meanwhile, STIKES Persada

Nabire, established in 2012 under the Persada Nabire Education Foundation, offers a Bachelor of Nutrition program with 271 active students and a Bachelor of Health Administration program with 29 new students, supported by 16 faculty members, all of whom hold master's degrees.

The characteristics of the research informants reflect the diversity of stakeholders involved in the stunting prevention ecosystem in Nabire District. The three health students who served as informants came from various study programs and semesters, had varying experiences in field practice and community service activities, and demonstrated different levels of involvement in public health issues. The three faculty informants have diverse educational backgrounds and expertise in nutrition, public health, nursing, and midwifery, with experience teaching and mentoring students in both academic and field practice activities. The two health workers from the community health center who served as informants have direct experience in implementing stunting prevention programs at the primary care level and frequently interact with students in the context of fieldwork or collaborative activities.

Student Understanding of Stunting: A Comprehensive Analysis

Based on in-depth interviews with student informants, it was revealed that their understanding of stunting has evolved beyond a simple definition as a physical growth disorder to include a more holistic understanding of the causal factors, multidimensional impacts, and comprehensive prevention strategies.

The majority of student informants understand stunting as a growth failure condition characterized by height that does not meet age standards for children; however, they also demonstrate awareness that stunting is a manifestation of more complex problems rooted in chronic malnutrition, particularly during the critical 1000 Days of Life period (WHO, 2021).

Students' understanding of the causes of stunting demonstrates a fairly high level of sophistication, as they not only identify direct factors such as inadequate intake of macro and micronutrients but also recognize the importance of indirect factors such as maternal nutritional status during pregnancy, exclusive breastfeeding practices, complementary feeding patterns, and family socioeconomic conditions (UNICEF, 2022). Some informants even mentioned more upstream factors such as access to health services, parental education levels, environmental sanitation conditions, and family food security as determinants contributing to stunting.

In terms of understanding the impact of stunting, student informants demonstrated good awareness of the short- and long-term consequences of this condition. The short-term impacts they identified include increased vulnerability to infectious diseases, anemia, delayed motor development, and sensory system disorders. For long-term impacts, they understand that stunting can affect cognitive development, learning ability, academic achievement, economic productivity in adulthood, and overall human resource quality (Black et al., 2013). This understanding shows that students have been able to link stunting with broader implications for social and economic development.

Regarding stunting prevention strategies, students' understanding includes approaches that begin in the preconception and pregnancy periods

through regular antenatal checkups, consumption of nutritious foods and recommended supplements, and physical and mental preparation for parenthood. They also understand the importance of early breastfeeding initiation, exclusive breastfeeding for the first six months, timely and quality complementary feeding, and regular monitoring of children's growth and development. Some informants also mentioned the importance of government programs such as supplementary feeding, food fortification, nutrition education, and environmental sanitation improvements as part of a comprehensive prevention strategy (Ministry of Health of the Republic of Indonesia, 2022).

Sources of Information and Learning: Student Knowledge Ecosystem

An analysis of the sources of information used by students to obtain knowledge about stunting reveals a diverse and multifaceted learning ecosystem, reflecting their adaptation to the digital age and the need for relevant and up-to-date information. Formal information sources through lectures remain the main foundation of students' knowledge, where they obtain information through courses that integrate stunting topics such as Maternal and Child Nutrition, Nutritional Status Assessment, Nutrition and Diet, Health Promotion, Nutrition throughout the Life Cycle, and Neonatal Midwifery Care. However, students acknowledge that there are no specific courses that comprehensively address stunting issues, resulting in fragmented knowledge that needs to be integrated from various sources.

The use of social media as an information source reveals an interesting pattern in the information-seeking behavior of digital-native students. Platforms like Instagram, TikTok, and YouTube are not only used for consuming entertainment content but also as learning resources that provide health information in an engaging, easy-to-understand, and accessible format. Students reported frequently finding educational content about child nutrition, stunting prevention tips, and testimonials from healthcare professionals or health influencers through these platforms.

However, they also recognize the need for digital literacy skills to filter and verify the quality of information obtained from social media (Nisa & Lily, 2022). Online scientific journal platforms are also becoming an increasingly utilized source of information for students, especially for academic assignments, research, or more in-depth knowledge development.

Access to international and national journal databases enables students to obtain the latest evidence-based information on stunting research, best practices in prevention, and innovations in nutrition interventions. However, the use of these scientific information sources is still limited to students with good English language skills and proficiency in scientific literature search.

Extension programs and workshops organized by community health centers, health departments, or other organizations also serve as valuable information sources for students, as they provide practical and contextual perspectives on the implementation of stunting prevention programs in the field. These activities often involve real-life case studies, interactive discussions with

experienced health workers, and sharing sessions with practitioners who have direct experience in addressing stunting.

The Role and Contribution of Students in Stunting Prevention

An analysis of the role of health students in stunting prevention reveals a broad and multifaceted spectrum of contributions, reflecting their adaptation to various contexts and opportunities to contribute to stunting prevention efforts. The role of students begins at the personal and family level, where they apply the knowledge they have acquired to maintain their personal nutritional status, especially female students who are aware of the importance of nutritional preparation during adolescence to prepare for future pregnancies. Students also act as educators within the family environment, providing education to siblings, parents, and relatives about the importance of balanced nutrition, proper diet, and parenting practices that support optimal child growth.

In a broader context, students actively participate in community health promotion and education activities through various modalities tailored to the characteristics and needs of the audience. The outreach activities conducted by students are not merely one-way communication but also include question-and-answer sessions, interactive discussions, and individual counseling, enabling them to provide more personalized and relevant information (Prasetyo & Lestari, 2020). Students also develop creativity in conveying educational messages through demonstrations of nutritious food preparation, cooking classes for mothers, and the use of visual aids that are attractive and easy to understand by people with diverse educational backgrounds.

Field Work Practice and community service programs serve as the primary platform for students to implement their roles in preventing stunting in a systematic and structured manner. These activities are facilitated by academic advisors, in collaboration with professional organizations, student associations, and other stakeholders, thereby providing students with a comprehensive learning experience.

In PKL activities, students not only act as implementers of pre-designed programs but are also involved in the planning, implementation, monitoring, and evaluation of programs, providing them with a holistic experience in public health program management (Sari & Nurfadhillah, 2022). Students' contributions to the development of educational media demonstrate their creativity and adaptability to the needs of effective health communication.

They developed various types of media such as posters, leaflets, booklets, educational videos, and digital content tailored to the characteristics of the audience and the local context. The use of comparative images between stunted and healthy children, attractive infographics, and simple and easy-to-understand language demonstrated their understanding of the principles of effective health communication.

Constraints and Challenges in Implementing the Role

The implementation of students' roles in stunting prevention faces various multidimensional constraints and challenges, reflecting the complexity of the social, cultural, and health system contexts in Nabire District. The most

frequently mentioned constraint by informants is a lack of confidence in conducting outreach and education to the community, especially when dealing with older audiences, those with more life experience, or those with higher levels of education. Doubts about their credibility and legitimacy as sources of health information often hinder the effectiveness of communication and reduce the impact of educational activities.

Varied community responses also pose a significant challenge for students in carrying out their educational roles. Some segments of the community show enthusiasm and active participation in educational activities, while others exhibit skeptical, apathetic, or even resistant attitudes toward the information provided. Factors such as educational level, previous experience with health programs, trust in traditional practices, and socioeconomic conditions influence the community's receptivity to the educational messages conveyed by students.

Limited access to data and information on stunting at the community level is a constraint that hinders students' ability to design evidence-based interventions tailored to the specific needs of the target community. Students often struggle to obtain accurate and up-to-date data on stunting prevalence, profiles of stunted children, dominant risk factors in specific areas, and information about previous intervention programs.

These data limitations impact the quality of program planning and the effectiveness of intervention targeting. Financial constraints are also a significant limiting factor, as students often have to use their own funds to provide educational materials, food for cooking classes, transportation for field activities, and various other needs that support stunting prevention activities (Apriningrum et al., 2024). Budget constraints from educational institutions or the programs they participate in often force students to be creative with minimal resources or reduce the scope and quality of activities that can be carried out. Communication barriers, especially related to language and local dialect differences, are a particular challenge for students who come from outside the area or have different cultural backgrounds.

Difficulties in understanding the local language and cultural nuances can hinder effective communication and reduce students' ability to build good rapport with the target community. In addition, limitations in the ability to communicate in an engaging and persuasive manner are also an obstacle in conveying complex educational messages in a way that is easy to understand and motivates behavioral change.

DISCUSSION

The Level of Student Understanding: Reflections on the Quality of Health Education

The research findings indicate that health students in Nabire Regency have a relatively good understanding of stunting, although there are still variations in the depth and comprehensiveness of their knowledge. A good understanding of the definition, main causes, and impacts of stunting indicates that the health education curriculum in the institutions studied has succeeded in conveying the fundamental concepts of stunting. However, limitations in

understanding more technical and complex aspects, such as the pathophysiological mechanisms of stunting, nutritional status assessment methodologies, and evidence-based intervention strategies, highlight the need for a more comprehensive and in-depth curriculum content.

Research by Nisa and Lily (2022), which found gaps in students' technical understanding of stunting, is consistent with the findings of this study, where students have solid basic knowledge but still need reinforcement in applied and technical aspects. This indicates that a learning approach that emphasizes hands-on experience, case-based learning, and direct practice in the field can improve students' understanding of stunting.

The integration of stunting topics in various courses, although there are no dedicated courses on stunting, demonstrates the efforts of educational institutions to mainstream stunting issues in the curriculum. However, this integrative approach also has potential weaknesses in terms of depth of discussion and continuity of learning, where students may obtain fragmented and unsystematic information. The development of specific courses or comprehensive learning modules on stunting could be a strategy to overcome these limitations.

Learning Drivers: Synergy between Formal and Informal

The diversity of information sources used by students reflects their adaptation to an increasingly complex and digital information ecosystem. The combination of formal classroom learning, access to social media, online journal platforms, and outreach activities shows that students have developed multimodal and adaptive learning strategies. However, this diversity of information sources also poses challenges in terms of quality control and consistency of information, where students need to develop critical thinking and information literacy skills to filter and verify the quality of the information they obtain.

The role of social media as an informal learning resource shows great potential that can be optimized to support health education. Platforms such as Instagram, TikTok, and YouTube can be effective media for disseminating health information if the content presented is of high quality, accurate, and created by credible sources. Educational institutions may consider developing engaging and easily accessible digital educational content through these platforms as a supplement to formal learning.

The importance of practical field experience emphasized by Sari and Nurfadhillah (2022) is also confirmed in this study, where students involved in PKL and community service programs demonstrated a more contextual and applicable understanding of stunting. This indicates that experiential learning is a crucial component of health education that cannot be fully replaced by theoretical classroom learning.

The Role of Students: Potential and Reality of Contribution

The broad spectrum of student roles, ranging from personal education to structured community programs, demonstrates the great potential of students as agents of change in stunting prevention. Their ability to adapt to various contexts

and audiences, develop creativity in delivering messages, and engage in various stages of the program shows that students can be valuable resources in stunting prevention efforts if empowered appropriately (Ramadhani Suradji et al., n.d.).

However, variations in the level of involvement and quality of student contributions indicate the need for a more systematic approach to student empowerment. Some students show high initiative and commitment, while others tend to be passive and only follow instructions. The development of reward and recognition systems, mentoring, and progressive responsibility can be strategies to increase student motivation and quality of involvement.

Collaboration with various stakeholders in PKL activities and community service demonstrates the importance of a multi-stakeholder approach in student empowerment. The involvement of lecturers, professional organizations, student associations, and other institutions creates an ecosystem that supports student capacity development and program sustainability. This collaboration model can be further developed to create a more systematic and sustainable platform for student involvement in stunting prevention.

Challenges as Opportunities for Capacity Development

The challenges identified in this study can be viewed as areas for capacity development and improvement of the health education system. The lack of confidence among students indicates the need to strengthen soft skills in the curriculum, including communication, public speaking, and interpersonal skills. Training programs focused on developing confidence and communication skills can be an important component in preparing students to serve as health educators.

Communication and cultural barriers indicate the need for a more contextual and culturally responsive approach in health education. Students need to be equipped with an understanding of the local socio-cultural context, the ability to adapt to diverse audiences, and effective communication strategies for various segments of society (Winarti et al., 2022). Cultural competency training can be an important element in curriculum development.

Limited financial and technical resources indicate the need for stronger institutional support and the development of partnerships with various stakeholders. Educational institutions can develop more adequate funding mechanisms for student activities, partnerships with the government and NGOs for resource sharing, and the development of sustainable social entrepreneurship models.

CONCLUSIONS AND RECOMMENDATIONS

This study produced comprehensive findings indicating that health students in Nabire Regency have significant potential to contribute to stunting prevention efforts, although there are still various areas that require strengthening and development. Students' relatively good understanding of stunting, although there are still gaps in technical and applicative aspects, provides a solid foundation for developing their role as agents of change in stunting prevention.

The diversity of information sources they utilize, ranging from formal learning to digital media, reflects their adaptation to an increasingly complex information era and indicates the need for integrative and multimodal learning approaches. The broad spectrum of student roles, from personal education to structured community programs, demonstrates their flexibility and creativity in contributing to stunting prevention.

However, variations in the quality and intensity of their involvement indicate the need for a more systematic and sustainable empowerment system. The challenges they face, including lack of self-confidence, limited resources, communication barriers, and limited access to data, provide a clear roadmap for capacity building and improvements to the health education system.

Therefore, decision-makers need to integrate stunting-specific courses into the health education curriculum that cover both theoretical and practical aspects, while developing standard guidelines for stunting education activities by students that can be applied nationally. Additionally, incentives and support should be available for students actively involved in stunting prevention programs through credit systems and certification.

FURTHER STUDY

This study has several limitations that need to be acknowledged. First, the study was limited to Nabire District, so generalizing the results to other areas requires caution and consideration of different local contexts. Additionally, from a methodological perspective, reliance on in-depth interviews without longitudinal observation limits understanding of the consistency of students' roles over the long term. Therefore, future research should examine changes in the understanding and role of health students in stunting prevention from the early stages of their studies until graduation and working in the field. Additionally, comparisons should be made between the understanding and role of health students in various regions with different socioeconomic characteristics and stunting prevalence rates.

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