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# Effect of applying the health promotion model in stunting prevention and behavior control in Indonesia

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## Abstract:

**BACKGROUND:** Stunting is a condition of failure to thrive in children, due to chronic malnutrition and recurrent infections. This study aimed to evaluate the effectiveness of implementing the health promotion model in stunting prevention and control behavior.

**MATERIALS AND METHODS:** This cross-sectional quantitative analytic study was conducted using a survey method involving 228 mothers of stunted children in Indonesia. Cluster random sampling was used. Data were collected using a questionnaire with a Likert scale, and then, they were analyzed using univariate analysis, multiple linear regression, and pathway analysis to determine the direct and indirect effects.

**RESULTS:** All respondents were of non-risk age (20–45 years), most had height >150 cm (83.8%), moderate weight (93.4%), multigravida parity (87.3%), middle education (70.2%), unemployed (91.7%), monthly income of less than 1,800,000 rupiahs (89.9%), and exclusive breastfeeding (97.4%). Sanitation, self-efficacy, and social support had a significant effect on stunting prevention and control behavior ( $P < 0.05$ ). Socioeconomic and sanitation effects through self-efficacy indirectly had a significant positive, while parenting through food or nutritional intake had a significant influence on the stunting incidence ( $P < 0.05$ ). Variables that had a significant positive effect on stunting prevention and behavior directly were perceived vulnerability, perceived severity, perceived obstacles, self-efficacy, social support, community organizing, and facilitator ( $P < 0.05$ ). Parenting through the health of diarrhea or acute respiratory infection (ARI) had no significant positive effect on the stunting incidence ( $P = 0.121$ ).

**CONCLUSION:** Almost all variables have a significant direct and indirect effect on stunting prevention and control behavior, as well as the stunting incidence, except parenting through the health of diarrhea or ARI.

## Keywords:

Behavior, health promotion, prevention, stunting

## Introduction

Stunting or stunted is a condition of failure to thrive in children, caused by chronic malnutrition and repeated infections, especially in the first 1000 days of life, which starts from the fetal stage until the child is 23 months old.<sup>[1]</sup> Stunting is at the heart of the six nutrition targets for 2025. Globally, stunting is included in achievement target number 2 on the Sustainable Development

Goals (SDGs), namely, ending hunger, achieving food security, improving nutrition, and promoting sustainable agriculture, and target number 3, namely, the priority of resilient food and job creation. The focus of these targets is community nutrition, the national health system, access to health and reproduction, family planning, and sanitation and clean water.<sup>[2]</sup>

Determinants of stunting are categorized into several characteristics, including household

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and housing, parental characteristics, and children's characteristics. In general, some causes of stunting are poor parenting practices and poor knowledge of mothers about health and nutrition before and during pregnancy, childbirth, and postpartum.<sup>[3]</sup> Stunting is caused by the interaction of poor nutrition, infection of the digestive organs (diarrhea), and upper respiratory tract infection (URTI), thus causing a vicious circle that results in a worsening of the nutritional status of toddlers. Repeated infections will reduce nutritional status through decreased appetite, impaired intestinal absorption, increased catabolism and direction of nutrients away from growth, and altered immune response.<sup>[4]</sup>

Based on the baseline report for the accelerated stunting prevention program for 2018–2024, the challenges to accelerating stunting prevention are still quite large. Health programs (specific interventions) have not made a significant contribution due to some factors, such as the prevalence of anemia in pregnant women and the proportion at risk for chronic energy deficiency (CED) in women of childbearing age (including pregnant women), which have not improved. In fact, the proportion has increased in the age group of 15–24 years. The results of other interventions, such as pregnant women who received supplementary iron supplements and toddlers giving exclusive breastfeeding still relatively low.<sup>[5]</sup> The findings of the literature review consistently show that inclusive breastfeeding, low household economic status, premature birth, length of delivery, and low education of mothers, as well as children living in villages, poor sanitation, and culture, are the determinants of child stunting in Indonesia.<sup>[6]</sup>

Society's bad behavior accounts for as much as 30% of stunting cases. Behavior is the second most significant factor after environmental factors that affect the health of individuals, groups, or communities. Positive change in health behavior is the ultimate goal of promotion and empowerment programs in the health sector.<sup>[7]</sup> The behavior of the community, especially among parents who have stunted children under five, in preventing and overcoming stunting includes good sanitation or environment or water, antenatal care (ANC), consumption of Fe tablets, feeding mother's milk, parenting style, nutritional intake, and routine weighing of toddlers.

The World Health Organization (WHO) estimates that 151 million children under five are stunted and 55% are in Asia.<sup>[8]</sup> The prevalence of stunting in Indonesia (30.8%) is still higher when compared to neighboring countries such as Thailand (10.5%) and Malaysia (20.7%). According to the United Nations Children's Fund (UNICEF), the stunting rate in Indonesia has remained high over the last decade, that is, around 37%. In 2000 the number of

stunted children under the age of five reached 203.6, and in 2020, it decreased to 149.2 million (26.7%).<sup>[8]</sup> The reduction in stunting at the national level was 6.4% over a 5-year period, from 37.2% (2013) to 30.8% (2018). However, this decline was still below the target rate for reducing stunting prevalence in 2024, that is, 14%.<sup>[9]</sup> West Java Province recorded 29.9% or 2.7 million toddlers suffering from stunting. Kuningan Regency ranks second highest in West Java (42.57%) after West Bandung Regency (53.28%).<sup>[10]</sup> The total number of children under five for the period August 2021–February 2022, as many as 68,364 toddlers and 3662 (5.3%) experienced stunting consisting of short toddlers and very short toddlers.<sup>[10]</sup>

A preliminary study through document review obtained secondary data results. Some of the stunting prevention and control program indicators have not reached the target, including; the percentage of Chronic Energy Deficiency (CED) pregnant women who receive additional nutritional intake (60.4%) is still far from the national achievement target of 90% in 2024, the coverage of families at risk of stunting who receive assistance (68.5%) of the achievement target of 90%, the percentage targets who have a good understanding of stunting in specific locations (locus) (45.3%) of the 80% target, the number of villages or sub-districts free of stunting (40.8%) of the national coverage target of 100%, and the percentage of families at risk of stunting who Utilizing yard resources to increase nutritional intake (23.5%) of the target of achieving 50% in toddlers by 2024.<sup>[10]</sup>

This study applied three theories or models of health promotion, which include (i) the intrapersonal or individual level, namely the health belief model (HBM), (ii) the interpersonal level, namely social cognitive theory (SCT), and (iii) the communal level. Based on a model of social support and community organizing.<sup>[11]</sup> This research was conducted to evaluate the effectiveness of implementing the health promotion model in stunting prevention and control behavior in Indonesia. The novelty of this research is the formulation of the "trans theory call model" or cross-theory model (HBM, social support, and community organization), namely a health promotion model in stunting prevention and control behavior. It is hoped that it can be used as a reference in the prevention and treatment of stunting.

## Methods and Material

### Study design and setting

This study was a quantitative analytic study with a cross-sectional approach, using a survey method or a complete self-administered survey, which is a primary data collection method by asking questions to respondents individually.<sup>[12]</sup> The research was conducted from August to November 2022.

### Study participants and sampling

The population in this study was 525 parents of stunted toddlers in Indonesia, who were spread across 12 villages with special locations for stunting (locus stunting). The cluster random sampling method was used with a sample frame of 228.

### Inclusion and exclusion criteria

Inclusion criteria were locus village community (special location) stunting, willingness to be a research respondent, the family having one or more stunted children aged 2 years and over, healthy stunted toddlers, and parents consisting of mother. Exclusion criteria were communities outside the village area, locus of stunting, stunted toddlers who are sick, and not willing to be a research respondent.

### Data collection tools and technique

Data collection was conducted using a questionnaire on 11 exogenous variables, namely the characteristics of parents of stunting toddlers (socioeconomic and sanitation), perceptions of vulnerability, severity, barriers, self-efficacy, social support, facilitators, community organizing, parenting, diarrhea or acute respiratory infection (ARI) health, and food or nutritional intake, and endogenous variables such as stunting prevention and control behavior and determinants of stunting events. The equipment included questionnaires, stationery, data recap sheets, and Likert Summated Rating (LSR).<sup>[13]</sup> Before the instrument was used, the validity and reliability were tested using the instrument validity test technique with product-moment correlation. The reliability test was conducted using the Cronbach alpha method, to determine whether the instrument was reliable or not, using a limitation; namely, reliability less than 0.6 was not good; meanwhile, 0.6 up to 0.79 was acceptable, and above 0.8 to 1 is good (has high consistency).<sup>[14]</sup>

### Data analysis

This study used univariate analysis to determine the frequency distribution of the respondent's characteristics and the causal relationship between variables. Multiple linear regression analysis was used to measure investigator causal effects, and pathway analysis was used to measure the direct and indirect relationships between variables in the model. Pathway analysis aimed to measure the direct relationship between variables in the model and the indirect relationship between variables in the model.<sup>[15]</sup>

### Ethical consideration

This study has an ethical clearance that has been approved by the health research ethics committee of the Health Research Institute of Health Science

Kuningan with the research code of ethics number 150/EP/STIKKU/2022.

## Results

### Univariate analysis

In this study, the characteristics of respondents consisted of age, education level, occupation, monthly income, weight, height, parity, and a history of breastfeeding exclusively [Table 1].

All respondents had an age not at risk (20–45 years). The height of the respondents was mostly >150 cm (n = 191, 83.8%), the majority of respondents (n = 213, 93.4%) had moderate weight (40–65 kg), and the parity of mothers was mostly multigravida parity (n = 199, 87.3%). On the educational characteristics, most of them had middle education (n = 160, 70.2%). Most of the respondents were unemployed (n = 209, 91.7%), the monthly income was mostly less than 1,800,000 rupiahs (n = 203, 89.9%), and exclusive breastfeeding was mostly given (n = 222, 97.4%) [Table 1].

### Multiple linear regression analysis

Exogenous variables that had a significant effect on stunting prevention and control behavior were

**Table 1: Respondents' characteristics (n=228)**

Characteristics	n	(%)
Age		
<20–>45 years (at risk)	0	0
20–45 years (not at risk)	228	100
Level of education		
Low education	57	25.0
Middle education	160	70.2
Higher education	11	4.8
Occupation		
Does not work	209	91.7
Working	19	8.3
Monthly income (rupiahs)		
<1.800.000	203	89.9
>1.800.000	25	11.0
Height		
<150 cm	37	16.2
>150 cm	191	83.8
Weight		
Skinny <40 kg	6	2.6
Medium 40–65 kg	213	93.4
Fat >65 kg	9	3.9
Parity		
Primigravida	27	11.8
Multigravida	199	87.3
Grand multipara	2	9
History of exclusive breastfeeding		
Not given	6	2.6
Given	222	97.4

sanitation ( $P = 0.056$ ), self-efficacy ( $P = 0.021$ ), and social support ( $P = 0.009$ ), whereas other variables such as socioeconomic, perceived stunting vulnerability, perceived stunting severity, perceived stunting obstacle, community organizing, and the facilitator had no significant effect. Parenting, health of diarrhea or ARIs, and food or nutrition intake variables had a significant effect on the determinant of stunting with a  $P$  value of 0.009, 0.001, and 0.008, respectively [Table 2].

The stunting prevention and control behavior variable had a significant effect on the determinant of stunting ( $P = 0.029$ ) [Table 3].

**Pathway analysis**

The results of path analysis showed that socioeconomic and sanitation effects through self-efficacy indirectly had a significant positive effect on stunting prevention and control behavior with a significant value of 0.014 and 0.006, respectively; besides, parenting through food or nutritional intake had a significant influence on the incidence of stunting ( $P = 0.046$ ). Meanwhile, parenting through health of diarrhea or ARI did not have a significant positive effect on the incidence of stunting ( $P = 0.121$ ).

**Table 2: Effect of exogenous variables toward endogenous variables in the locus stunting**

Variable X	Variable Y			
	Stunting prevention and control behavior (Y1)		Stunting incident (Y2)	
	t	P	t	P
Socioeconomic	0.745	0.157		
Sanitation	1.678	0.056*		
Perceptions of vulnerability to stunting	1.494	0.137		
Perception of severity of stunting	0.369	0.712		
Perceived obstacles	-0.637	0.502		
Self-efficacy	2.193	0.021*		
Social support	2.640	0.009*		
Community organizing	0.652	0.515		
Facilitator	-554	0.580		
Parenting			3.678	0.009*
Nutrition or food intake			3.284	0.001*
Health of diarrhea or acute respiratory infection			3.256	0.008*

Note: \*a significant if the  $P < 0.05$ , variable X=exogenous variables, variable Y=endogenous variables

**Table 3: Effect of stunting prevention and control behavior (Y1) on the determinant of stunting (Y2) in the locus stunting**

Variable Y1	Variable Y2 Determinant of stunting	
	t	P
Stunting prevention and control behavior	2.193	0.029*

Note: \*significant if the significant value  $> 0.05$

Perceived vulnerability ( $P = 0.002$ ), perceived severity ( $P = 0.021$ ), perceived obstacles ( $P = 0.010$ ), self-efficacy ( $P = 0.021$ ), social support ( $P = 0.063$ ), community organizing ( $P = 0.082$ ), and facilitator ( $P = 0.053$ ) were exogenous variables that had a significant positive effect on stunting prevention and behavior directly [Figure 1 and Table 4].

**Discussion**

**Characteristics**

Of the 228 respondents, all were of a non-risk age of 20–45 years. According to the Indonesian Ministry of Health (2018), age categories are very useful for monitoring young and old population development,<sup>[16]</sup> so that the handling given to every phenomenon that occurs in society can be improved or developed properly. This finding is in accordance with the data of Kuningan Regency Regional Development Agency (2022).<sup>[17]</sup> Based on the calculation of the estimated population according to age composition, the population of Kuningan Regency is included in the population structure of the 15- to 64-year age group, namely 712,377 people (66.30%).<sup>[17]</sup>

Research supported and conducted by National Institute on Aging (2020) helps identify lifestyle factors and health behaviors that directly affect physical, cognitive, sensory, and emotional health and the risk of disease as we age, such as studies linking work and social engagement with cognition.<sup>[18]</sup> In this case, the researchers differentiated the measurement results between male and female respondents based on a gender perspective. Men are productive breadwinners, while women are seen from the age factor as at risk and not at risk related to reproductive health.

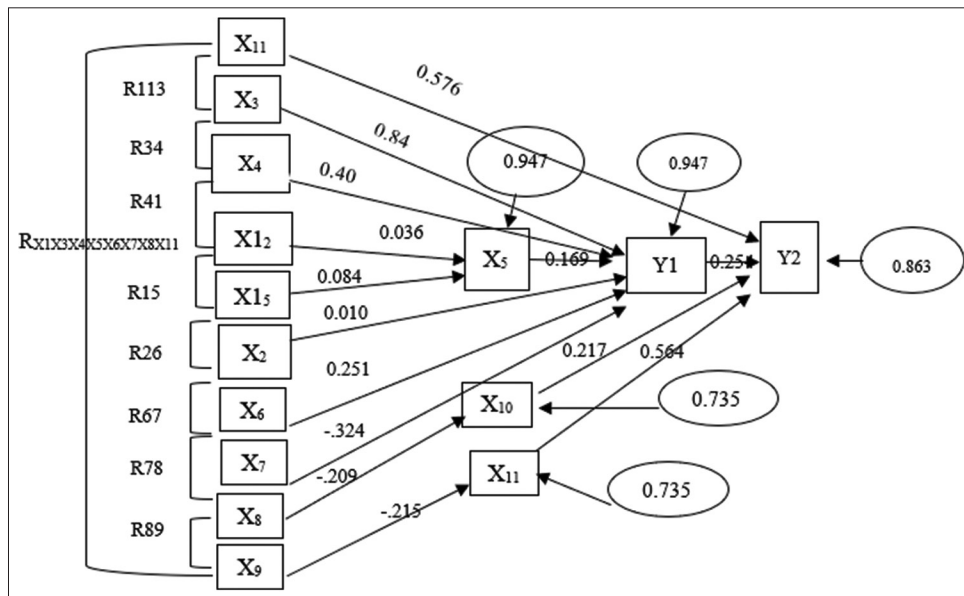
In Kuningan District, the literacy rate is relatively high, above the West Java Province average of 98.78, and the average length of schooling is relatively high, indicating strong community awareness. Thus, the dependency ratio is 50.8%.<sup>[17]</sup> The role of parents in educating children is very dominant, determines, and has a very large influence on the development and growth of the quality of education.

Based on occupation, almost all respondents did not work (91.7%). The percentage of poor people in Kuningan Regency is still relatively high, with 13.59% in 2016. Most of the respondents are housewives. In the view of researchers, every parent must be a role model for children, as well as their attitude in the parenting process. This will affect the child’s daily behavior. This is evidenced by the respondent’s education. Even though the location of the village is far from the city, the consistency is to complete a minimum high school education. This is in line with previous research, which

**Table 4: Direct, indirect, and total effect of the health promotion model on stunting prevention, control behavior, and the determinants of stunting incidence**

Variable Y	Variable X	Effect			Total Contributions		
		Direct	Indirect				
			Through self-efficacy	Through food nutrition intake		Through health of diarrhea or ARI	
SP and CB	Socioeconomic		0.084		0.169	0.014	
SP and CB	Sanitation		0.036		0.169	0.006	
SP and CB	Perceptions of vulnerability to stunting	0.010			0.254	0.002	
SP and CB	Perception of severity of stunting	0.084			0.254	0.021	
SP and CB	Perceived obstacles	0.040			0.254	0.010	
SP and CB	Self-efficacy	0.084			0.254	0.021	
SP and CB	Social support	0.251			0.254	0.063	
SP and CB	Community organizing	0.324			0.254	0.082	
SP and CB	Facilitator	0.209			0.254	0.053	
Determinants of stunting	Parenting			0.215	0.217	0.046	
Determinants of stunting	Parenting				0.564	0.217	0.121

Notes: \*P<0.05. SP and CB=stunting prevention and control behavior, ARI=acute respiratory infection



**Figure 1:** Pathway analysis of the direct and indirect effects of exogenous variables and endogenous variables. Note: X1<sub>(2)</sub> = socioeconomic, X1<sub>(5)</sub> = sanitation, X2 = perception of susceptibility to stunting, X3 = perception of severity, X4 = perception of obstacles, X5 = self-efficacy, X6 = facilitator, X7 = social support, X8 = community organizing, X9 = parenting, X10 = food intake, X11 = health (diarrhea or acute respiratory infection), Rx134567811 coefficient path way (variable influencer) X1, X3, X4, X5, X6, X7, X8, X9, X11 to X2; Y1 = stunting prevention and control behavior, Y2 = incidence of stunting in toddlers

stated that the mother’s formal education reduces the risk of stunting, the mother’s height is short, and the head of the household is different from the parents.<sup>[19]</sup>

There has been a shift in the urbanization of the productive age. Currently, in accordance with the Kuningan Regency Regional Development Agency (2022), there have been many studies on infrastructure development to provide more employment opportunities for the productive age generation.<sup>[17]</sup> Family income is associated with the ability of a family to provide for its family. According to Black’s research, overweight and malnutrition occur in low-income countries. This is consistent with

research that stunting correlates with many long-term consequences, including poor cognitive development and higher rates of morbidity and mortality, making stunting a major contributor to poverty.<sup>[19]</sup> The average height of Indonesians is 158.17 cm. The average height for men is 163.55 cm, while for women it is 152.79 cm, and Indonesia ranks 81<sup>st</sup> in the world’s shortest population. The population is still low.

Most of the parity characteristics (mothers) had multipath parity of 199 (87.3%), and the characteristics of the history of exclusive breastfeeding were mostly given exclusive breastfeeding of 222 (97.4%). This is

because most of the respondents have become family planning acceptors so the average child is between two and three people. Breastfeeding for toddlers can reduce the risk of being underweight and wasting. Research conducted in Uganda and Ethiopia showed that giving complementary foods prematurely and not fulfilling nutritional needs could inhibit growth.<sup>[20]</sup>

The chance of a child experiencing stunting increases when they are 12–23 months old due to suboptimal breastfeeding and complementary feeding. This is exacerbated by poor sanitation. Stunting had a significant relationship with the ASI variable.<sup>[21]</sup> This was in accordance with research in the Central African Republic.<sup>[19]</sup> This study found that exclusive breastfeeding could reduce the prevalence of stunting in children under five. Diarrhea and cough are associated with an increased risk, and continued breastfeeding is associated with a reduced risk of stunting.

### Socioeconomic

Socioeconomic status is a combined measure of the economic and social position of an individual or family relative to other people based on income, employment, and education.<sup>[22]</sup> In particular, the bivariate analysis revealed that lower family income, mother's educational level, and the father's educational level predicted all three problem behavior domains (i.e., internalizing problems, externalizing problems, and total problem behavior). Furthermore, multivariate analysis revealed that lower family income consistently predicts all behavioral problem domains, lower maternal education level predicts both external and total behavioral problems, and father's educational level does not predict clinically significant behavioral problems.

The researchers assume that the average income of respondents is below the regional minimum wage of <1,800,000, and the mindset of the respondents is only thinking about how to fulfill basic needs, so the behavior of preventing and overcoming stunting is still considered unimportant.<sup>[23]</sup>

### Sanitation

Sanitation is an effort to monitor several physical environmental factors that affect humans, especially things that affect the effects, damage physical development, health, and survival.<sup>[24]</sup> Through a review of the literature, various environmental risk factors, to different degrees, are associated with stunting, highlighting the importance of considering how the environment interacts with nutrition. Health promotion activities may be more effective if environmental factors are considered along with nutritional interventions.<sup>[1]</sup> The researchers assume that efforts to maintain environmental hygiene and public health are good. Most people have access to

drinking water from wells and the local water supply utility, and most have latrines and waste management, and sewerage is up to standard, through monitoring of environmental factors.

### Perceptions of stunting vulnerability

There is an individual's readiness to change behavior to avoid a disease or reduce health risks, one of which is influenced by perceptions of susceptibility to disease and potential threats. For a new behavior to be adopted, one needs to believe that the benefits of the new behavior are greater than the consequences of continuing the old behavior. This allows obstacles to be overcome and new behaviors to be adopted.<sup>[2]</sup> The assumption of the researchers is that some respondents feel that stunted children have the potential or are susceptible to disease and affect the child's future. The individual's socio-demographic background influences perceptions about the threat of disease and efforts to overcome it. To strengthen the decision to act, triggering factors (news from the media, invitations from people you know, or someone reminding you) are necessary. If the trigger factor is strong enough and the individual feels ready, the individual will carry out the recommended actions to overcome or prevent disease.

### Perception of stunting severity

The HBM shows that cues to action also influence behavior. Cues to action are events, people, or things that move people to change their behavior. Hearing socialization on TV or radio news about stunting is a cue for action related to stunting prevention and control behavior. HBM explains that cues or triggers to act are necessary to encourage participation in the health behavior being promoted.<sup>[25]</sup> The perception of the severity of stunting makes individuals think about finding solutions to avoid the effects of a disease. Usually, they start looking for information to prevent more serious potential from happening, and this is not in line with the results of research where the perception of the severity of stunting, respondents still think that stunting children do not have a dangerous impact because respondents see no symptoms or signs that lead to severity.

### Perception of stunting barriers

Perceived barriers to taking action include perceived discomfort, cost, and danger (side effects of medical action). Another obstacle is remote access to health services and a lack of health workers (pediatricians and nutrition specialists).<sup>[11]</sup> There is a significant relationship between perceptions of stunting prevention barriers and parenting style ( $P = (0.030) < \alpha (0.05)$ ; IDR = 1.497; 95% CI = 0.978–2.292).

Perceived barriers are obstacles that are felt to exist within a person to behave healthily, for example, a

mother who has a short child will seek prevention efforts by measuring height or weight at the Integrated Service Post (Posyandu) and consulting a doctor, but the husband does not support remote service access.<sup>[26]</sup>

### Self-efficacy

Self-efficacy is one of the most important characteristics that determine behavior change. Self-efficacy, is the belief that one will be successful in carrying out actions.<sup>[27]</sup> Mothers with low self-efficacy generally do not have the will to provide healthy nutrition and physical activity for their children. Meanwhile, if the mother's self-efficacy is high, it will increase the mother's confidence in caring for and raising children well.<sup>[27]</sup> There is a significant relationship between the mother's knowledge and the mother's self-efficacy regarding stunting prevention with a *P* value of 0.000 ( $<0.05$ ). A mother's well-being during pregnancy is at risk, largely depending on their self-efficacy and competencies to perform their various roles such as maternal and social roles.<sup>[28]</sup>

According to the researchers' assumptions, self-efficacy is a factor that has a significant relationship with stunting prevention and control behavior. Someone with high self-efficacy will lead good health behavior to take action.<sup>[29]</sup>

### Social support

The health promotion strategy consists of advocacy, social support, and community empowerment.<sup>[22]</sup> Social support is verbal or nonverbal information, advice, real help, or behavior provided by people who are familiar with the subject in their social environment or in the form of presence and things that can provide emotional benefits or affect the behavior of the recipient. The assumption of social support researchers is a strategy that needs to be taken into account in which the strategy is called atmosphere development or fostering a conducive atmosphere, and social support also helps people to overcome all the problems that occur. In this case, social support is needed by the community to support stunting prevention and control behavior.<sup>[30]</sup>

### Community organizing

Communities are often used as a place where individuals from various backgrounds share a sense of place located in a specific geographical area (a country, village, city, or neighborhood) or a virtual space via a communication platform.<sup>[31]</sup> The researcher's assumption is that building relationships between individuals or groups has become a strategic key. Communities need to be involved more often in programs related to community needs.

From this understanding, it is illustrated that in essence health promotion is the main support in every health program. In other words, health promotion, even

though it stands alone as a health program, cannot work alone. Health promotion must always go hand in hand with every health program to prevent the emergence of new problems (new cases), overcome existing problems (cases), and maintain and improve public health status. Therefore, it can be understood that health promotion activities can be conducted by special health promotion officers and other health workers.

### Parenting style on the determinants of stunting

Parenting is one of the problems that can affect the occurrence of stunting in toddlers. Parents with poor or low parenting styles have a greater chance of their children becoming stunted than parents with good parenting styles.<sup>[32]</sup> Parenting, basic sanitation, and early marriage are factors that play an important role in the incidence of stunting.<sup>[33]</sup> The researcher's assumption is that the perception that parenting is fully the responsibility of the mother is still firmly attached to most of the respondents; the mother's parenting pattern is that most of the mothers do not work, and automatically, the mother's role is very large in raising children, but sometimes the obstacle that many mothers feel is the intervention of the grandfather grandmother or others in parenting.

### Health (diarrhea or ARI or ARI)

URTIs such as pneumonia and bronchiolitis are the main contributors to child mortality. Infection increases energy requirements to cause immunity and cell repair.

Less energy intake due to decreased appetite and malabsorption exacerbates this condition. The imbalance between demand and income causes children to experience stunting. There is a relationship between ISPA and stunting.<sup>[34]</sup> This is different from the results of research that has been conducted, and the conclusion from these results is that ARI is not related to the incidence of stunting. In the research assumption of 228 respondents, the majority of mothers said that their children had no history of chronic diarrhea or ARI, only occasionally. Naturally, the child's immunity is formed by itself. Mechanisms that could potentially explain integrated effects on linear development are genetic characteristics, epigenetic effects, programmed metabolic changes, mechanisms of reduced space for developing fetus, and sociocultural factors such as poverty and deprivation.

### Food or nutrition intake

The highest stunting rate occurs in the first two years of postnatal life. The first thousand days of life is a critical period for stunting, but continued flat development in an unfavorable environment will maintain this condition and cause short stature in schoolchildren and adults. Mothers with short stature, especially teenagers, tend to have babies with low birth weight, which then have the potential to experience failure to thrive in childhood.<sup>[3]</sup>

Environmental influences affect growth disorders such as malnutrition in children and mothers, low breastfeeding, inadequate food, infection, and inflammation.<sup>[35]</sup>

### Stunting prevention and control behavior toward stunting events

Behavior sometimes only follows a certain sequence so the formation of positive behavior is not always influenced by knowledge and positive attitudes. The increase in maternal behavior is related to the previous respondent's behavior ( $53.52 \pm 13.89349$ , 113%). There is a relationship ( $r \leq 0.05$ ) between prior related behavior, perceived benefit, perceived resistance to action, and prevention behavior.<sup>[36]</sup> The researcher assumes that the weakness of the predisposing factors for most of the respondents is that their understanding of stunting is still low, and respondents know about stunting but do not understand what it means and what its effects are. This becomes the basis for the strength of one's motivation or intention to do something, namely self-efficacy as a driving factor for behavior change consisting of knowledge, attitudes, beliefs, values and perceptions, traditions, and other elements that exist in individuals and society related to health behavior. Another study states that the HBM pattern reduces pregnancy anxiety by increasing knowledge and changing beliefs and behavior, so that the health and well-being of the mother and fetus are maintained so that they can give birth to healthy babies.<sup>[37]</sup>

### Conclusion

Stunting is often associated with an increased risk of morbidity and mortality. Behavior is influenced by self-efficacy and high social norms, expectations, observations, and the ability to control behavior in preventing and controlling stunting. Overall, the variables studied had a significant relationship, but only diarrhea or ARI health, which did not have a significant relationship. Healthy and clean-living behavior will naturally form a child's immunity. Health development is the foundation for creating quality and competitive human resources (HR) to make Indonesia superior. In addition, prevention and control of disease are an integral part of the implementation of national development and regional development. The limitations of the study are the uneven distances and specific locations and the strong culture and belief that stunting is a hereditary factor that does not require special treatment. It is hoped that policymakers can improve the health of mothers and babies.

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### Conflicts of interest

There are no conflicts of interest.

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