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A Descriptive Study on Stunting in Toddlers & Contributing Factors in Cibungur Village, Sumedang District, Indonesia

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Aims: This research aims to determine the relationship between parents practicing Clean and Healthy Living Behavior (PHBS) and the incidence of stunting in toddlers aged 2-5 years in Cibungur Village, Sumedang Regency in 2023.
Study Design: This research is an analytical observational study with a cross-sectional design.
Place and Duration of Study: The research was carried out in Cibungur Village, Sumedang Regency, West Java in May 2023.

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Methodology: The sample in this study was 139 parents who had children aged 2-5 years in Cibungur Village, Sumedang Regency, West Java. The sampling technique used in this study was consecutive sampling, that is, all subjects who came and met the selection criteria were included in the study until the required number of subjects was met. A questionnaire instrument was used to obtain data on variables that influence (X1) parents' healthy hygiene behavior. The variable influenced by (Y) is the incidence of stunting in toddlers aged 2-5 years in Cibungur Village, Sumedang Regency. The data source is parents of toddlers aged 2-5 years in Cibungur Village, Sumedang.
Results: The results of the correlation test of the 10 PHBS indicators studied with the incidence of stunting found a relationship between exclusive breastfeeding (p = 0.004) and the habit of washing hands with soap (p = 0.001) with the incidence of stunting while history of childbirth assisted by health personnel (p = 0.066), weighing toddler routine at posyandu (p=0.070), eradicating mosquito nests (p = 0.778), daily physical activity (p = 1.000), consumption of fruits and vegetables every day (p = 0.594), not smoking in the house (p = 0.877), use of clean water (p = 0.066) and use of healthy latrines (p = 0.066) were not associated with stunting.
Conclusion: Of the ten indicators of a Clean and Healthy Lifestyle, it was concluded that only two of them were related to the incidence of stunting, namely the Exclusive Breastfeeding indicator and the Habit of Washing Hands with Soap indicator.

Keywords: Clean and healthy lifestyle; stunting; toddler.

1. INTRODUCTION

The nutritional problem situation in Indonesia is no longer related to the problem of undernutrition or overnutrition. This is because stunting, also known as short children, is still the main nutritional problem for babies and children under the age of two in Indonesia with the highest prevalence. Nutrition is a very important part of the growth and development of toddlers, which is closely related to health and intelligence. With the momentum of the golden generation in 2045 that Indonesia wants to achieve, this is of course the main focus to be resolved immediately. To produce quality human resources, preparation is needed so that children can grow and develop as optimally as possible according to their abilities [1]. Based on the Ministry of Health's Indonesian Nutrition Status Survey (SSGI), the prevalence of stunted toddlers in Indonesia will reach 21.6% in 2022. This figure is down 2.8 points from the previous year. In West Java Province, the prevalence of stunted toddlers has decreased by around 3% from 24.5% to 20.2% in 2022. East Nusa Tenggara (NTT) as the province with the top position in the prevalence of stunted toddlers has also decreased from 37.8% to 35. 3%, however, there must still be strong efforts to reduce the national stunting prevalence rate more drastically [1a,1b]. The national target to be achieved is 14% in 2024 [2]. Stunting is a child's body condition with short or very short stature based on length/height according to age which is less than -2 Standard Deviation (SD) on the WHO growth curve, caused by chronic malnutrition which is related to low socioeconomic status, nutritional intake, and maternal health. poor conditions, history of recurrent illness, and inappropriate feeding practices for infants and children. Four factors directly influence the occurrence of stunting, namely family and household factors, breast milk (ASI), complementary foods (MPASI), and infection. Lack or excess of nutrients in the 0-2 year age period is irreversible so it has an impact on a child's short-term and long-term quality of life. Stunting will affect long-term brain development which in turn has an impact on cognitive abilities and school performance. Apart from that, growth disorders also affect the body's endurance and work capacity. Long-term effects are also related to a decrease in the ability to oxidize fat, causing the risk of obesity and degenerative diseases including hypertension, type 2 diabetes mellitus, and cardiovascular diseases [3].

In particular, family and household factors such as food availability, child-rearing patterns, environmental sanitation, health services, maternal education, maternal employment, maternal knowledge of nutrition, number of family members, family income, and poverty have a huge impact on children's nutritional status. Children who have good nutritional intake and are in a healthy environment will have healthier physical growth and cognition because this is the scope of child welfare. Basic sanitation facilities at home can include the availability of healthy latrines, clean water facilities, wastewater

management, and rubbish bins. Research by Ramdaniati [4] et al suggests that clean water sources are related to the incidence of stunting in toddlers because unsuitable water will cause various infectious diseases. Therefore, it is necessary to increase knowledge and practice regarding family and household factors, namely clean and healthy living behavior. Clean and Healthy Living Behavior (PHBS) is all health behavior carried out with awareness so that family or family members can help themselves in the health sector and play an active role in health activities in the community. PHBS is a way of preventing behavior by people or families from various diseases. Thus, PHBS actions in daily life are still needed because social elements contribute 30-35% to welfare status [5]. The aim of PHBS is an effort to provide learning experiences for individuals, families, groups, and communities by opening lines of communication, providing information and education to improve knowledge, attitudes, and behavior through advocacy approaches, building an atmosphere and community movements, so that they can implement ways of life. healthy to maintain, maintain, and improve public health [5,6]. Basic Health Research (Riskesdas) in 2007, 2013, and 2018 shows that the proportion of households practicing PHBS over the last ten years has increased by around 28%. A detailed description of the five-year PHBS proportion, namely 11.2% (2007) to 23.6% (2013) and then 39.1% (2018). Changes in indicators made in 2018 had an impact on achieving the PHBS index. The results of the national analysis show that 39.1% of households in Indonesia practice clean and healthy living behavior. If we look at each PHBS composite indicator, there are five indicators with a household proportion above 80%, namely the indicator of practicing childbirth with health workers (92.5%); having a clean water source (86.8%); defecating in the latrine (84.6%); preventing larvae (81.9%); and weighing toddlers (79.8%). More than half of the households have household members who do not smoke at home (51.1%) and wash their hands using soap and clean water (56.8%). The lowest proportion of households practicing PHBS is in the indicators of exclusive breastfeeding (42.4%), doing physical activity every day (27.6%), and consuming fruit and vegetables every day (1.4%) [7]. In connection with this description, researchers are interested in researching PHBS and the incidence of stunting in toddlers 2-5 years old. This research aims to determine the relationship between PHBS and the incidence of stunting in children aged 2-5 years in Cibungur Village, Sumedang Regency in 2023. The research problem in this research is whether there is a relationship between the clean lifestyle of parents of toddlers aged 2-5 years and the presence of stunting.

2. MATERIALS AND METHODS

2.1 Materials

Stunting is a condition of failure to grow in toddlers or babies under five years old due to chronic malnutrition so that the child's height does not match his age. Malnutrition occurs when the baby is in the womb and in the early days after the baby is born, however, stunting only appears after the baby is 2 years old. Short (stunted) and very short (severely stunted) toddlers are toddlers whose body length (PB/U) or height (TB/U) according to their age is compared with the 2006 WHO-MGRS (Multicentre Growth Reference Study) standard while the definition of stunting is according to Ministry of Health (Kemenkes) is a child under five with a z-score value of less than -2SD/standard deviation (stunted) and less than –3SD (severely stunted) [8,9]. The 1000 HPK growth period is the growth period from a fetus to a 24-month-old child. A child is categorized as experiencing stunting if his height is below minus two standard deviations in length or the height of a child his age is below minus two standard deviations in length or height of a child his age [10]. Riskesdas in 2018, the incidence of stunting in Indonesia reached 10.2% with a prevalence of stunting in children under five of 30.8%. This figure shows that stunting cases are still relatively high compared to the maximum limit of stunting incidence from WHO, which is 20% [11].

Based on the 2022 SSGI results, the prevalence of stunting by age group in Sumedang Regency in 2022, at the age of 0-5 months is 18.2%, 6-11 months is 27.7%, 12-23 months is 29.2%, 24-35 months was 27%, 36.47 months was 31.8%, and 48-59 months was 25.7% with a total of 21,616 stunted children, which results increased from 2021 with a total of 17,541 [12]. The main cause of stunting is malnutrition when the mother is pregnant. Pregnant women who are affected by malaria, hypertension, HIV/AIDS, or have a history of other diseases also affect the development of the fetus in the womb. Stunting can also occur if pregnant women do not get enough nutritional intake such as calcium, iron, folic acid, omega-3 and other important vitamins and minerals. As a result, the fetus in the womb

does not receive adequate nutrition, is born with a low birth weight, is at risk of malnutrition, or other complications [13].

The Minister of Health of the Republic of Indonesia has created Guidelines for the Development of Clean and Healthy Living Behavior which are contained in the Regulation of the Minister of Health of the Republic of Indonesia Number: 2269/MENKES/PER/XI/2011 which regulates PHBS efforts throughout Indonesia by referring to PHBS management patterns, starting from the assessment stage , planning, and implementation as well as monitoring and assessment. These efforts are made to empower the community to maintain, improve and protect health so that the community is aware, willing and independently actively participates in improving the community's health status [14].

2.1.1 PHBS in the household

The primary target must be to practice behavior that can create a household with a clean and healthy lifestyle, namely [6].

1. The birth is assisted by health personnel

In Indonesia, there are still groups of people who still trust and rely on midwives and other non-medical personnel in the birthing process. This is considered very unsafe and not sterile to handle. Therefore, during the birthing process, medical personnel, namely doctors and midwives, must be assisted [15,16,17].

2. Give the baby exclusive breast milk

Babies need to be given exclusive breast milk from birth to six months of age. Exclusive breastfeeding here means that the baby is only given breast milk by the mother without any additional food or drink. 14 The nutrients in breast milk are very good and suitable for the baby's needs. Giving breast milk directly to babies is very safe and ensures cleanliness. Apart from that, breastfeeding can also help babies with sucking, swallowing, and breathing reflexes [18].

3. Weigh your toddler every month

Toddlers are weighed regularly every month at Posyandu to monitor their growth. The results of the weighing will be recorded on the Healthy Towards Card (KMS). Toddlers being weighed every month at Posyandu has the benefit of detecting whether toddlers are experiencing growth disorders and knowing whether toddlers are sick. [15,16].

4. Use clean water

Clean water is vital for people's health, whether it is used for drinking, household purposes and food production. Using clean water for daily needs is one of the clean and healthy living behaviors that must be carried out [19,20,21].

5. Wash your hands with clean water and soap

Washing your hands can prevent the spread of germs from one person to another. Washing your hands is highly recommended, especially when the possibility of being exposed to and spreading germs is very large, namely [22,23]:

a. Before, during, and after preparing food.
b. Before and after eating.
c. After using the toilet.
d. After sneezing and coughing.
e. After touching the trash can.

6. Use a healthy toilet

A latrine is a facility used by humans to dispose of human waste. To stop the chain of disease transmission, healthy latrines must be available and used in every household. A healthy latrine must be in a place that is easy for all occupants of a house to reach. 15.25 A healthy latrine must not contaminate drinking water sources and the soil have no animals, be safe to use, have walls and a roof for protection, and have lighting and air ventilation. odorless, water and soap available, have tools for cleaning toilets [24,25].

7. Eradicates mosquito larvae

Eradicating mosquito larvae and nests must be carried out so that the transmission of dengue hemorrhagic fever can be prevented. Infectious diseases cause increased energy requirements, if not balanced with adequate intake it can cause malnutrition. Eradication of mosquito larvae and nests must be carried out to create a larva-free home [26,27].

8. Eat fruit and vegetables every day

Processing fruit and vegetables should not be done haphazardly. Vegetables and fruit should

be consumed raw or steamed. If it is processed by boiling, this can cause some vitamins and minerals to be lost because high heating can break down some vitamins [16,28].

9. Do physical activity every day

When someone expends energy by moving, that individual is doing physical activity. If you want your physical activity to have health benefits, then you should do physical activity for 30 minutes per day or 150 minutes per week. In everyday life, various types of physical activity can be done, such as jogging, gardening, walking, and so on [29,30].

10. No smoking in the house

Smoking is the most common form of tobacco use worldwide. All forms of tobacco are dangerous, and there is no safe level of tobacco exposure. The economic costs of tobacco use are enormous and include significant health care costs to treat diseases caused by tobacco use as well as high rates of morbidity and mortality caused by smoking [31,32,33,34].

2.2 Methods

2.2.1 Research Design

This research is an analytical observational study with a cross-sectional design that aims to study the correlation between variables through data analysis. Cross-sectional design or cross-sectional method to determine the correlation between parental PHBS and the incidence of stunting in toddlers aged 2-5 years in Cibungur Village, Sumedang Regency in 2023.

2.2.2 Place and Time

The research was carried out in Cibungur Village, Sumedang Regency, West Java in May 2023.

2.2.3 Population

The target population in this study was all toddlers aged 2-5 years in Cibungur Village, Sumedang Regency, West Java.

2.2.4 Sample

The sample in this study was 139 parents who had children aged 2-5 years in Cibungur Village, Sumedang Regency, West Java. The sampling technique used in this study was consecutive sampling, that is, all subjects who came and met the selection criteria were included in the study until the required number of subjects was met.

2.2.5 Inclusion Criteria

Parents with children aged 2-5 years in Cibungur Village, Sumedang Regency, West Java.

2.2.6 Exclusion Criteria

1. Parents with children aged 0 to < 2 years in Cibungur Village, Sumedang Regency, West Java.
2. Parents with children aged > 5 years in Cibungur Village, Sumedang Regency, West Java.

2.2.7 Processing and analysis of data

The data obtained will then be analyzed using a computerized system. The data obtained will be analyzed using the IBM SPSS (Statistical Package for the Social Sciences) 26.0 program with the following process:

1. Editing, to ensure that the data obtained is filled in completely or completely and can be read well, is relevant and consistent.
2. Coding can be obtained from data sources that have been checked for completeness and then coding the data with certain numbers or codes so that the data processing process is easier and simpler.
3. Data entry, data that has been coded is processed with the help of a computer program.
4. Cleaning, the process of checking the data that has been entered again whether there are errors or not.
5. Data analysis, data processing, and compiling the results to be reported. Data analysis was carried out using univariate analysis procedures which aim to see the relationship between research variables.

3. RESULTS AND DISCUSSION

3.1 Description of the Characteristics of Research Respondents

In this study, researchers chose parents with toddlers aged 2-5 years in Cibungur Village, Sumedang Regency, as the research population consisting of 58 respondents. All respondents met the inclusion and exclusion criteria and as a

form of research ethics, the subjects had first filled out an informed consent form before continuing to fill out the questionnaire, and an anthropometric examination was carried out.

3.1.1 Frequency distribution of respondents based on stunting incidents in toddlers age 2 - 5 years in cibungur village, sumedang regency

The frequency Distribution of Respondents Based on Stunting Events is presented in Table 1 below:

Table 1. The frequency distribution of respondents based on stunting

Stunting events	Frequency	Percentage (%)
Stunting	24	41.4
Not Stunting	34	58.6
Total	58	100

3.1.2 Frequency distribution of respondents based on education of mothers and toddlers age 2 - 5 years in cibungur village, kab. sumedang

A description of the frequency of respondents based on parental education is presented in Table 2, where it can be seen that most parents' education only reaches junior high school (SMP).

Table 2. Frequency distribution of respondents based on education of mothers

Mother's Education	Frequency	Percentage (%)
Elementary School	14	24.1
Junior High School	27	46.6
Senior High School	13	22.4
Vocational School	3	5.2
Bachelor	1	1.7
Total	58	100

3.2 Univariate Analysis

The PHBS indicators used in this study include 10 indicators, namely childbirth assisted by health workers, routine weighing of toddlers at the posyandu, exclusive breastfeeding, the habit of washing hands with soap, eradicating mosquito nests, doing physical activity every day, consuming vegetables and fruit every day, use of clean water, use of healthy latrines, and family members do not smoke. The results of the distribution of the 10 PHBS indicators in this study can be seen in Table 3, as follows:

Table 3. PHBS indicator description

Indicator	Frequency	Percentage (%)
The birth is assisted by health personnel		
Yes	55	94.8
No	3	5.2
Total	58	100
Toddlers' Routine Weighing Behavior at Posyandu		
Routin	53	91.4
No a Routin	5	8.6
Total	58	100
Exclusive Breastfeeding Status		
Yes	39	67.2
No	19	32.8
Total	58	100
Wash Hands with Soap		
Yes	29	50
No	29	50
Total	58	100
Eradication of Mosquito Nests		
Yes	35	60.3
No	23	39.7
Total	58	100
Daily Physical Activity		
Yes	56	96.6
No	2	3.4
Total	58	100

Indicator	Frequency	Percentage (%)
Consume Vegetables and Fruit Every Day		
Yes	29	50
No	29	50
Total	58	100
Smoking Status		
Yes	38	65.5
No	20	34.5
Total	58	100
Use of Clean Water		
Yes	55	94.8
No	3	5.2
Total	58	100
Use of Healthy Latrines		
Yes	55	94.8
No	3	5.2
Total	58	100

The distribution of births assisted by health workers and pregnancy checks at health service facilities in Cibungur Village is 94.8%, of which there is a small portion, namely 5.2%, who give birth assisted by health workers such as midwives and obstetricians. When visiting Antenatal Care (ANC), pregnant women will receive a comprehensive examination regarding their pregnancy, nutritional counseling, receive folic acid and iron supplements, as well as appropriate health education. So it can prevent mothers from experiencing anemia, prevent mothers from giving birth prematurely and have low birth weight (LBW) babies and babies from getting adequate nutrition from the womb [35].

The distribution of toddler weighing behavior in the Cibungur Village posyandu was in the routine category at 91.4% and the non-routine category at 8.6%. These results show that mothers routinely carry out weighing every month, although there are a small number who do not routinely because of other work-related activities carried out during the posyandu schedule, including farming and entrepreneurship. According to Destiadi, et al the level of attendance at active posyandu has an influence on monitoring nutritional status [36].

The distribution of history of exclusive breastfeeding was 67.2%. This figure is quite high compared to those who do not provide exclusive breastfeeding, namely 32.8%. According to Ballard and Morrow, the growth factors needed for children in the process of growth and development are contained in breast milk. High levels of antibodies to protect children from infectious diseases are also found in breast milk [37].

The distribution of the habit of washing hands with soap for mothers under five is 50%. Respondents said that since the pandemic they have become diligent in washing their hands with soap. The remaining 50% said they only wash their hands when they remember.

Distribution of mosquito nest eradication (PSN) was 60.3%. Based on information from the Village Midwife and Village Head, although the level of PSN behavior is still low, the incidence of dengue fever is very rare in Cibungur Village.

The distribution of daily physical activity was 96.6%. This figure is considered very high. Respondents said that due to the difficulty of the signal, generally for communication respondents went directly to their house and were supported by several climbing village roads so that physical activity would be heavier than on flat roads.

The distribution of daily consumption of vegetables and fruit is 50%. Respondents said that vegetables were generally consumed more often than fruit and the fruits most frequently consumed were cucumbers and bananas.

Distribution of clean water use: Clean water use for daily needs is 94.8%. Almost all households use clean water for daily needs such as washing clothes and bathing. The water source used comes from mountain springs. On average, the water consumed daily comes from refill gallons.

The distribution of family members who do not smoke is 34.5%. These results prove that around 65.5% of family heads from 58 respondents in Cibungur Village still smoke.

The distribution of healthy latrine use was 94.8%. Most respondents said they used a squat latrine with a goose neck system in the bathroom with good air circulation, a roof and door and equipped with a septic tank as a disposal unit and also water to clean it. However, 5.2% still use pit latrines in the rice fields.

3.3 Bivariate Analysis

3.3.1 Analysis of the relationship between history of childbirth assisted by health workers and stunting events

Table 4 shows that births assisted by health workers tend to be higher among non-stunted toddlers, namely 58.6%. The results of statistical tests using the Chi-Square test, obtained a value of p=0.066, which means there is no relationship between births assisted by health workers and the incidence of stunting in toddlers in Cibungur Village.

The results of this research are in line with research conducted by Ramadhini, et al, namely that there is no relationship between pregnancy checks (Antenatal Care) and childbirth assisted by health workers and the incidence of stunting in toddlers aged 0-24 months in the Seberang Padang health center working area. This is because there are other factors that influence the incidence of stunting, including birth weight, family income and maternal education [38] This is different from research conducted by Abeway, et al [39], namely that ANC visits are one of the factors associated with the incidence of stunting in children. Children whose mothers do not attend ANC are at risk of stunting 4 times higher than children whose mothers attend ANC visits [35] Research conducted by Hutasoit, et al also states that there is a relationship between ANC visits and the incidence of stunting where toddlers will be fulfilled. nutritional requirements for 1000 HPK if the mother visits ANC during her pregnancy [35].

The discussion should not repeat the results, but provide a detailed interpretation of the data. This should interpret the significance of the findings of the work. Citations should be given in support of the findings. The results and discussion part can also be described as separate, if appropriate.

3.3.2 Analysis of the relationship between routine weighing of toddlers at posyandu and stunting incidents

Table 5 shows that toddlers who are regularly/active in posyandu activities have stunting status, namely 41.4%, while those who are not stunted reach 50%. The results of statistical tests using the Chi-Square test, obtained a value of p=0.070, which means there is no relationship between routine weighing of toddlers at posyandu and the incidence of stunting in toddlers in Cibungur Village.

The results of this research are in line with research conducted by Wahyuningtyas, namely that there is no relationship between toddler participation in posyandu and the incidence of stunting. The participation of toddlers in the posyandu is carried out in the context of routine weighing every month. This relationship does not exist because the use of counseling at the posyandu is less than optimal for mothers of toddlers so that it has an impact on mothers' knowledge regarding the nutritional status and health of toddlers [40] This is inversely proportional to research conducted by Payker which states that there is a significant relationship between compliance. toddlers attending posyandu with stunting incidents in Kempong Hamlet Banjaroya Kalibawang Kulon Progo [41].

Table 4. Relationship between history of childbirth assisted by health workers and incidence of stunting

The birth is assisted by health personnel	Stunting Status				Total		ρ*
	Stunting		Not Stunting				
	N	%	N	%	N	%	
Yes	21	36.2	34	58.6	55	94.8	0.066
No	3	5.2	0	0	3	5.2	
Total	24	41.4	34	58.6	58	100	

** Chi-Square Test*

Table 5. The relationship between routine weighing behavior of toddlers at posyandu and stunting incidents

Routine Weighing of Toddlers at Posyandu	Stunting Status				Total		ρ*
	Stunting		Not Stunting				
	N	%	N	%	N	%	
Yes (routin)	24	41.4	29	50	53	91.4	0.070
No (not routin)	0	0	5	8.6	5	8.6	
Total	24	41.4	34	58.6	58	100	

**Chi-Square Test*

3.3.3 Analysis of the relationship between exclusive breastfeeding and the incidence of stunting

Table 6 shows that the number of toddlers who were not given exclusive breast milk was higher among toddlers who experienced stunting, 13 people (22.4%) compared to those who did not experience stunting, 11 people (19.0%). The results of statistical tests using Chi-square between exclusive breastfeeding and the incidence of stunting obtained a value of p = 0.004, which means there is a relationship between exclusive breastfeeding and the incidence of stunting in toddlers in Cibungur Village, Sumedang Regency.

This is in line with research conducted by Husna A, et al in Arongan Village, Kuala Pesisir District, Nagan Raya Regency, that there is a relationship between exclusive breastfeeding and the incidence of stunting (p = 0.000) [42]. According to the Indonesian Ministry of Health, one factor that causes stunting in babies and toddlers is maternal factors, including the mother's knowledge regarding exclusive breastfeeding and the nutritional intake that needs to be given to toddlers, poor parenting patterns, and inappropriate feeding to toddlers. Other factors that can influence stunting are maternal education and family income [43].

3.3.4 Analysis of the relationship between the habit of washing hands with soap and the incidence of stunting

In Table 7, it can be seen that the habit of washing hands with soap among toddlers who experience stunting is 6 people (10.3%) while the habit of not washing hands with soap among toddlers who experience stunting is 18 people (31.0%). The results of the Chi-square statistical test between the relationship between the habit of washing hands with soap and the incidence of stunting showed a significant relationship (p < 0.05).

The results of this study showed a significant relationship between the habit of washing hands with soap and the incidence of stunting (p = 0.001). This is in line with research conducted by Syam DM, et al [44] which was conducted in Central Sulawesi, namely Banggai Regency, Donggala Regency, Sigi Regency, and Palu City, that there was a relationship between washing hands with soap and the incidence of stunting (p = 0.001) .44 In this study, 113 respondents who had not washed their hands with soap, of whom 78 people (69.0%) experienced stunting and 35 people (31.0%) did not experience stunting [45].

Table 6. The relationship between exclusive breastfeeding and stunting

Exclusive Breastfeeding Status	Stunting Status				Total		ρ*
	Stunting		Not Stunting				
	N	%	N	%	N	%	
Yes	11	19.0	28	48.3	39	67.2	0.004
No	13	22.4	6	10.3	19	32.8	
Total	24	41.4	34	58.6	58	100	

**Chi-Square Test*

Table 7. The relationship between the habit of washing hands with soap and the incidence of stunting

The habit of washing hands with soap	Stunting Status				Total		ρ*
	Stunting		Not Stunting				
	N	%	N	%	N	%	
Yes	6	10.4	23	39.6	29	50	0.001
No	18	31.0	11	19.0	29	50	
Total	24	41.4	34	58.6	58	100	

*Chi-Square Test

3.3.5 Analysis of the relationship between mosquito nest eradication and stunting incidents

Table 8 shows that households that eradicate mosquito nests tend to be more likely to have non-stunted toddlers, namely 34.5% compared to 25.9% for stunted toddlers. The results of statistical tests using the Chi-Square test, obtained a value of p=0.788, so H0 is accepted, which means there is no relationship between eradicating mosquito nests and the incidence of stunting among toddlers in Cibungur Village.

The results of this study are not in line with research conducted by Yulnefia, et al regarding the relationship between a history of infectious diseases with mosquito vectors and the incidence of stunting in toddlers aged 24 - 36 months in Kampar Regency. This research states that a history of infectious diseases increases the risk of stunting up to 4.2 times greater than that of children aged 24-36 months with a history of rarely suffering from infectious diseases [46].

3.3.6 Analysis of the relationship between doing physical activity every day and the incidence of stunting

Table 9 shows that household members who do physical activity every day tend to be more in the non-stunted status, namely 56.9% compared to the stunted status of 39.7%. The results of statistical tests using the Chi-Square test, obtained a value of p=1,000, which means there is no relationship between doing physical activity every day and the incidence of stunting in toddlers in Cibungur Village.

The results of this study are not in line with research conducted by Sari LI, et al that there is a relationship between doing physical activity every day and the incidence of stunting in children (p = 0.009). One of the factors causing stunting is physical activity, which is a way to stimulate children not to experience stunting, which includes all kinds of bodily activities, including exercise, as an effort to balance the expenditure and intake of nutrients, especially energy sources in the body, as well as smoothing the metabolic system in the body [47,48].

Table 8. Relationship between mosquito nest eradication and stunting incidents

Mosquito Nest Eradication	Stunting Status				Total		ρ*
	Stunting		Not Stunting				
	N	%	N	%	N	%	
Yes	15	25.9	20	34.5	35	60.3	0.778
No	9	15.5	14	24.1	23	39.7	
Total	24	41.4	34	58.6	58	100	

*Chi-Square Test

Table 9. The relationship between doing physical activity every day and the incidence of stunting

Doing Physical Activity Every Day	Stunting Status				Total		ρ*
	Stunting		Not Stunting				
	N	%	N	%	N	%	
Yes	23	39.7	33	56.9	56	96.6	1.000
No	1	1.7	1	1.7	2	3.4	
Total	24	41.4	34	58.6	58	100	

*Chi-Square Test

3.3.7 Analysis of the relationship between daily consumption of vegetables and fruit and the incidence of stunting

Table 10 shows that household members who consume vegetables and fruit every day tend to be more in the non-stunted status, namely 27.6% compared to the stunted status of 22.4%. The results of statistical tests using the Chi-Square test, obtained a value of p=0.594, which means there is no relationship between daily consumption of vegetables and fruit and the incidence of stunting among toddlers in Cibungur Village.

This shows that vegetable and fruit consumption is also influenced by other factors such as each family's food security, economic status, and maternal education regarding toddler nutrition. The results of this study are not in line with research by Nurul, et al (2020) regarding the influence of consumption of animal protein, vegetables and fruit on toddlers at the Juanda Community Health Center, Samarinda City with 64 respondents. It was found that toddlers who did not finish their food at every meal were three times more likely to experience stunting and increases 10 times higher if the household does not provide vegetables less than three times a week. 48 The smaller the amount of nutrients consumed by toddlers, the greater the risk of the toddler experiencing nutritional problems such as stunting [49].

3.3.8 Analysis of the Relationship between Smoking Behavior and Stunting Incidents

Table 11 shows that household members who smoke tend to be more likely to have stunted toddlers, namely 27.6% compared to non-stunted toddlers, namely 20.3%. Household members who do not smoke tend to be more likely to be non-stunted toddlers, namely 37.9% compared to 13.8% of stunted toddlers. The results of statistical tests using the Chi-Square test, obtained a value of p=0.877, which means there is no relationship between family members not smoking and the incidence of stunting among toddlers in Cibungur Village.

The results of this study are in line with research conducted by Candra (2013), namely that there is no relationship between smoking fathers (family members who smoke) and the incidence of stunting in toddlers. A smoking father is not a risk factor for stunting in children. 49 According to Zubaidi there is a relationship between parental smoking behavior and the incidence of stunting in children. This is related to the hampered absorption of nutrition in children and the priority of the cost of shopping for cigarettes compared to the cost of shopping for nutritious food needed for children's growth and development, the risk of intrauterine growth failure (IUGR) which is one of the factors causing stunting [50].

Table 10. The relationship between daily consumption of vegetables and fruit and the incidence of stunting

Daily Consumption of Vegetables and Fruit	Stunting Status				Total		ρ*
	Stunting		Not Stunting				
	N	%	N	%	N	%	
Yes	13	22.4	16	27.6	29	50	0.594
No	11	19.0	18	31.0	29	50	
Total	24	41.4	34	58.6	58	100	

**Chi-Square Test*

Table 11. The relationship between smoking behavior and stunting incidents

Smoking Behavior	Stunting Status				Total		ρ*
	Stunting		Not Stunting				
	N	%	N	%	N	%	
Yes	16	27.6	12	20.7	28	48.3	0.877
No	8	13.8	22	37.9	30	51.7	
Total	24	41.4	34	58.6	58	100	

**Chi-Square Test*

Table 12. Relationship between clean water use and stunting incidents

Clean Water Use	Stunting Status				Total		ρ*
	Stunting		Not Stunting				
	N	%	N	%	N	%	
Yes	21	36.2	34	58.6	55	94.8	0.066
No	3	5.2	0	0	3	5.2	
Total	24	41.4	34	58.6	58	100	

Chi-Square Test

Table 13. The relationship between the use of healthy latrines and the incidence of stunting

The Use of Healthy Latrines	Stunting Status				Total		ρ*
	Stunting		Not Stunting				
	N	%	N	%	N	%	
Yes	21	36.2	34	58.6	55	94.8	0.066
No	3	5.2	0	0	3	5.2	
Total	24	41.4	34	58.6	58	100	

Chi-Square Test

3.3.9 Analysis of the relationship between clean water use and stunting incidents

Table 12 shows that households with clean water conditions have toddlers who are 58% less likely to be stunted, not much different from stunted toddlers, namely 36.2%. There are also households with unclean water conditions with a stunting status of 5.2%. The results of statistical tests using the Chi-Square test, obtained a value of p=0.066, which means there is no relationship between the use of clean water and the incidence of stunting among toddlers in Cibungur Village.

The results of this research are in line with research conducted by Fibrianti, et al [51], namely that there is no relationship between the means of providing clean water and the incidence of stunting in the working area of the Loceret Nganjuk Health Center, this shows that the source of clean water is a protective factor where the source of clean water is adequate. is not the only factor related to the incidence of stunting. 51 In contrast to research conducted by Nisa, there is a significant relationship between sanitation, clean water supply and the incidence of stunting, where respondents with poor clean water provision have a chance of experiencing stunting. 2.705 times greater than respondents who have good clean water supplies [52].

3.3.10 Analysis of the relationship between the use of healthy latrines and the incidence of stunting

Table 13 shows that households that have healthy toilets tend to have more toddlers without stunting, namely 58%, and toddlers with stunting, namely 36.2%, while households that have unhealthy toilets with stunting are also found to be 5.2%. The results of statistical tests using the Chi-Square test obtained a value of p=0.066, which means there is no relationship between the use of healthy latrines and the incidence of stunting among toddlers in Cibungur Village.

This is not in line with research conducted by Adzura M, et al in the working area of the Harapan Baru Community Health Center, Samarinda City, which stated that there was a relationship between the use of healthy latrines and the incidence of stunting (p = 0.000). Of the 19 children who experienced stunting, 17 children (89.5%) lived in houses that had quality sanitation facilities that did not meet the requirements to be declared healthy, such as having a gooseneck latrine but no lid and it was channeled directly into the river [53] Research by Adzura M, et al. said that healthy latrines can prevent the direct spread of disease originating from human feces, thus preventing disease-carrying vectors from coming into direct contact with the feces of latrine users and the surrounding environment. 53 Research conducted by Fink, et al (2011) said that having a healthy latrine is a protective factor. the occurrence of stunting, so it is not the only factor related to the incidence of stunting [46].

4. CONCLUSION

Of the ten indicators of a Clean and Healthy Lifestyle, it was concluded that only two of them were related to the incidence of stunting, namely the Exclusive Breastfeeding indicator and the Habit of Washing Hands with Soap indicator.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

CONSENT

As per international standards or university standards, respondents' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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