The Influence of Child Caregivers' Personal Hygiene and Family Smoking Behavior on Stunting

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ABSTRACT

***Background**: Stunting is a problem that still occurs in Indonesia. It is a chronic nutritional problem associated with insufficient food intake so that nutritional needs are not fulfilled over a long period of time. Stunting also can be caused by indirect factors such as environmental and behavioral. **Objective**: the aim of this study was to analyze the correlation of child caregivers' personal hygiene implementation and family smoking behavior on the occurrence of stunting. **Methods**: This type of research is an analytic survey with a case control study approach. The number of respondents was 25 cases and 25 controls so that the total respondents were 50 respondents. **Results**: The results of the examination found that personal hygiene of caregivers and smoking habits in the families of stunted toddlers were mostly inadequate and there was a smoking habit in the families of stunted toddlers. There is a significant relationship between defecation behaviors and the incidence of stunting with a p value of 0.02 (<0.05). Based on multivariate analysis, it was found that unqualified defecation behaviors had a 63.3% probability of stunting. **Conclusion**: There is a significant correlation between defecation behaviours and the occurrence of stunting with a p-value of 0.02 (<0.05). According to multivariate analysis, respondents with defecation behaviors that did not meet the standards had a 4.03 times greater risk of having a child with stunting.*

***Keywords**: caregivers, family smoking, personal hygiene, stunting*

INTRODUCTION

Stunting is a chronic nutritional condition caused by insufficient food intake, resulting in long-term nutritional demands not being met. This causes abnormal growth and disruptions in the process of brain development, resulting in diminished intelligence, and makes children under the age of five prone to sickness. Stunting is defined as a Z-score of less than -2 SD to -3 SD (short/stunted) and less than -3 SD (very short/severely stunted) based on the body length index for age (PB/U) or height for age (TB/U) based on anthropometric examination for measuring children's nutritional status (Rahmadhita, 2020; Yuniar et al., 2020) .

According to global data, the United Nations Children's Fund (UNICEF) discovered that the global frequency of stunting has dropped from 33.1% to 22% between 2000 and 2020.[3] West and Central Africa, East Africa, and Africa are the three regions with the greatest rates of stunting. South and South Asia had prevalence rates of roughly 32.5%, 32.3%, and 31.8%, respectively, whereas Southeast Asia has the world's fifth-highest incidence of stunting at 13.5% (UNICEF-WHO-World Bank: Joint Child Malnutrition Estimates - 2021 edition interactive dashboard - UNICEF DATA, n.d.).

According to the 2021 Indonesian Nutritional Status Survey (SSGI), the prevalence of stunting in Indonesia is around 24.4%, a 6.4% drop from 30.8% in 2018. Although the prevalence of stunting in Indonesia has decreased, the rate remains far below the government's aim ("Tahun 2022 Angka Prevalensi Stunting Harus Turun Setidaknya 3%" - Stunting, n.d.).

According to Minister of PPN/Head of Bappenas Decree Number Kep 42/M.PPN/HK/04/2020, Pekanbaru will become the focal point for integrated interventions to reduce stunting in 2021. According to Pekanbaru City Health Service data for 2019, there were 2,714 toddlers with poor nutritional status, or

Received: 31-03-2023, Accepted: 30-05-2023, Published Online: 08-03-2024

17.67%, 587 undernourished toddlers, or 0.8%, and 469 underweight toddlers, or 0.6%. According to the results of the summary of nutritional status through e-PPGBM aged 0-59 months in 2019 at the Pekanbaru City Health Office, the percentage of stunted children, i.e. children with very short nutritional status, includes 10 centres, namely Rumbai Bukit Health Center 39.4%, Limapuluh Health Center 29.3 %, Rejosari Health Center 27.8%, Sidomulyo RI Health Center 27%, Muara Fajar Health Center 25.5%, Melur Health Center 22%, Payung Sekaki Health Center 18.1%, Sail Health Center 15.8%, Tenayan Raya Health Center 14.1%, Harapan Raya Health Center 13.5% of the 21 work areas of the Health Center in Pekanbaru city.

Stunting is caused not only by unbalanced food intake and infectious diseases, but also by indirect factors such as the amount of knowledge of the mother, parenting style, family income, lack of hygiene/sanitation, and clean and healthy living behavior (PHBS) (Apriani, 2018). The habit of defecating, the habit of washing hands with soap (hand wash), the management of drinking water and household food, the smoking habits of parents in the house, and the safeguarding of household waste and liquid waste are all PHBS attitudes related to the occurrence of stunting 1).

Personal hygiene is an important aspect of living a clean and healthy lifestyle. PHBS is essentially a health habit carried out by both individuals and families on the awareness that is effective for illness prevention. Clean and healthy living behavior in the household is beneficial so that family members can practice as well as understand how to maintain, maintain, and improve. If PHBS is not implemented in a family or individual, toddlers who live in these household situations are more likely to catch diseases caused by an unclean lifestyle, making toddlers more prone to experiencing poor nutritional status (Lynawati, 2020; Rahmawati, 2018). This is related to poor cleanliness, which promotes digestive system issues, resulting in less energy spent on growth and more energy spent on fighting infection. The role of PHBS patterns can influence the likelihood of stunting in toddlers (Fildzah et al., 2020).

Several research studies have discovered an association between stunting and PHBS. According to research conducted in the Work Area of the Pucang Sawit Community Health Center in Surakarta City, there was an effect of implementing PHBS on the incidence of stunting, with a 51.4% higher risk in non-PHBS families compared to PHBS families. The influence of the practice of washing hands with soap, the availability of latrines, the use of clean water, and not smoking within the house on the prevalence of stunting is particularly influential in the implementation of PHBS (Apriani, 2018).

Furthermore, research conducted in the Matan Hilir Selatan sub-district, Ketapang Regency, West Kalimantan province revealed that mothers or carers with stunted children who do not practice PHBS have a 71.3% risk when compared to mothers or carers who practice PHBS well in the household setting ((Aprizah, 2021). Bacteria can arise as a result of poor personal hygiene habits. Bacteria will enter the child's body as a result of exposure to the mother or carer and will have an impact on the child's health, causing failure to thrive in children if not balanced with proper nutrition. Children that are malnourished have low body resistance to disease, making them susceptible to disease (Aisah et al., 2019). This will result in stunting in children.

According to an initial study of researchers at the Puskesmas' two working regions, namely the Limapuluh Health Center and the Rumbai Bukit Health Center, the people living in these areas are still lacking in implementing PHBS. People are less concerned about their health, both inside and outside the house. Aside from that, economic concerns influence the community's ability to meet the nutritional needs of each family, such that nutrition and environmental issues adapt the community to a life of hardship and limits. This is also related to the community's difficulty in implementing the PHBS pattern. Therefore, the topic of this study is the effect of applying personal hygiene for caregivers on stunting. Because of the high incidence of stunting in the Rumbai Bukit and Limapuluh health centers and the lack of public knowledge related to hygiene in the area. The purpose of this study was to find out child caregivers' personal hygiene

Received: 31-03-2023, Accepted: 30-04-2023, Published Online: 08-03-2024

implementation and family smoking behavior on the occurrence of stunting.

METHODS

The type of this research was an analytic survey with a case-control study approach.The research was conducted in two Community Health Center work areas that have the highest data on stunting cases in Pekanbaru City, namely the Rumbai Bukit Health Center Work Area and the Limapuluh Health Center Work Area. The research was conducted from October 2021 to December 2022. The research sample included 50 respondents, with 25 cases and 25 controls. The population in this study consisted of all carers who were dominant in caring for toddlers and were familiar with the conditions in families with stunted and non-stunted toddlers in the Rumbai Bukit Health Center work area and the Limapuluh Health Center work region. The stunting population was derived from Puskesmas e-PPGBM statistics. Subjects were determined using the consecutive sampling method, in which all attached subjects who met the selection criteria were included in the study until the required number of subjects was met.

This study has six independent variables, including nail cleanliness, hand wash, bath habit and change clothes, defecation behavior and smoking habit. This study divided nail cleanliness, hand wash, bath habit and change clothes and defecation behavior into two categories: Not fulfilling the requirement and fulfilling the requirement. Smoking habit was categorized into smoking and no smoking. All of the variables were measured by questionnaire.

Data Analysis

Univariate analysis was conducted to describe the risk factors using frequency and percentage. In bivariate analysis we used Chi square test with α 0.05, 95% CI and p <0.05 was determined as significant result. We also used the odds ratio to determine whether the independent variable was a risk factor or protective factor. The variables which had OR < 1 was a protective factor, OR = 1 was not risk factor, and 0R > 1 was a risk factor. Multivariate analysis used the multiple logistic regression test. The likelihood of stunting happening can be determined using the multiple logistic regression equation, which is as follows:

$$P = \frac{1}{1+e^{-y}}$$

Ethical Approval

This research has passed the ethical review by the Medical and Health Research Ethics Unit of the Faculty of Medicine, Riau University with number B / 080 /UNI19.5.1.1.8/UEPKK/2021.

RESULTS AND DISCUSSION

Table 1. Description of Respondents

Variable	Stunting Occurrence			
	Stunting		Not Stunting	
	N	%	n	%
Toddlers' Age				
• 6-23 months	9	81.8	2	18.2
• 24-59 months	16	41	23	59
Gender				
• Male	14	51.9	13	48.1
• Female	11	47.8	12	52.2
Toddlers' Caregiver				
• The Mother	20	51.3	19	48.7
• Sister/Brother	1	50	1	50
• Grandmother	4	44.4	5	55.6

Based on Table 4.1, it is known that the majority of toddlers are between the ages of 24 and 59 months, both in the case group, which included 16 respondents (41%), and the control group, which included a total of 23 respondents (59%). It is also known that the majority of toddlers are male, with 14 respondents in the case group (51.9%) and 13 respondents in the control group (48.1%). Furthermore, the caregivers for toddlers were mothers, with 20 respondents (51.3%) in cases and 19 respondents (48.7%) in the control group.

Received: 31-03-2023, Accepted: 30-05-2023, Published Online: 08-03-2024

Table 2. Description of the Application of Personal Hygiene in Families with Stunted and Non-Stunted Toddlers

Personal hygiene	Stunting Occurrence			
	Stunting		Not Stunting	
	n	%	n	%
Nail cleanliness				
• Not fulfilling the requirement	16	61.5	10	38.5
• Fulfilling the requirement	9	37.5	15	62.5
HAND WASH				
• Not fulfilling the requirement	18	51.4	17	48.6
• Fulfilling the requirement	7	46.7	8	53.3
Bathe habit and change clothes				
• Not fulfilling the requirement	7	50	7	50
• Fulfilling the requirement	18	50	18	50
Defecation behavior				
• Fulfilling the requirement	19	63.3	11	36.7
• Not fulfilling the requirement	6	30	14	70
Smoking habit				
• There is smoking habit	18	54.5	15	45.5
• There is no smoking habit	7	41.2	10	58.5

Table 2 shows that the majority of caregivers' nail hygiene practices fall under the category of not meeting the standards with the number of case respondents, which is 16 respondents (61.5%); the majority of HAND WASH habits do not meet the standards with the number in the case group, which is up to 18 respondents (51.4%); habits for bathing and changing clothes mostly met the standards with the number of case respondents, which is 18 respondents (50%); with a total of 19 case respondents (63.3%), defecation behaviours mostly did not meet the standards; and smoking habits in households with stunted toddlers mostly exhibited smoking habits with a total of 18 respondents (54.5%).

Table 3. The Effects of Personal Hygiene Implementation on Stunting Cases

Personal hygiene	Stunting Occurrence				OR	p-value
	Stunting		Not Stunting			
	n	%	n	%		
Nail cleanliness						
• Not fulfilling the requirement	16	61.5	10	38.5	2.66	0.08
• Fulfilling the requirement	9	37.5	15	62.5		
HAND WASH						
• Not fulfilling the requirement	18	51.4	17	48.6	1.21	0.75
• Fulfilling the requirement	7	46.7	8	53.3		
Bathing habit and change clothes						
• Not fulfilling the requirement	7	50	7	50	1	1
• Fulfilling the requirement	18	50	18	50		
Defecation behavior						
• Not fulfilling the requirement	19	63.3	11	36.7	4.03	0.02
• Fulfilling the requirement	6	30	14	70		
Smoking habit						
• There is smoking habit	18	54.5	15	45.5	1.71	0.37
• There is no smoking habit	7	41.2	10	58.5		

According to Table 3, there is no significant correlation between nail hygiene and stunting (p-value = 0.08). When we look at the odds ratio, we obtain an OR of 2.66, which is greater than one. This demonstrates that nail hygiene which does not satisfy the standards has a risk of stunting 2,667 times more than those who do meet the standards. The hand wash habit has no significant correlation with the incidence of stunting (p-value = 0.75) with an odds ratio (OR) of 1.21 or (OR> 1), so the risk of hand wash habit that does not meet the standards and fulfils the standards is nearly the same. There is no significant correlation between the practice of bathing and changing clothing and the incidence of stunting (p-value = 1), with odds ratios (OR) of 1 or (OR = 1),

Received: 31-03-2023, Accepted: 30-04-2023, Published Online: 08-03-2024

demonstrating that the habit of bathing and changing clothes is not associated to the occurrence of stunting. Furthermore, there is a significant correlation between defecation behaviors and the incidence of stunting (p-value = 0.021), with an odds ratio (OR) value of 4.03 or (OR> 1), indicating that defecation behaviors that do not meet the risk standards are 4.03 times more likely to be in the stunting group than those who met the standards. There is no significant correlation between smoking habits and the incidence of stunting (p-value = 0.37), with an odds ratio (OR) of 1.71 or (OR> 1), this indicates that smoking has a risk of 1.71 in the stunting group compared to those who have no habit of smoking.

Table 4. The Effect of Simultaneous Application of Personal Hygiene on Stunting

Variable	B	*p-value*	OR	95% CI
Defecation behavior	1.394	0.024	4.03	1.201-13.526
Constant	-0.847	0.082	0.429	

Table 4. According to Table 4, the data obtained are only defecation behaviors that do not meet the standards as the most dominating variable in stunting incidence. Multiple logistic regression analysis yielded the mathematical formula y=-0.847+1.394*1 (defecation behaviors) with a value of Y=0.547. According to the multiple logistic equation, we find the result below:

$$p = \frac{1}{1+2{,}72^{-0{,}547}}$$

p = 0.633 (63.3%).

According to the calculation results, if the respondent has a risk factor for defecation practices that do not fulfil the standards, there is a 63.3% possibility of stunting in children (probability value 0.633). Other variables account for the remaining 36.7%.

Discussion

1.1 Description of Respondents with Stunted and Non-Stunted Toddlers

Toddlers are between the ages of 24 and 59 months in both the case group (16 respondents (41%), and the control group (23 (59%). According to a study done in the South Lore District, the work area of the Gintu Public Health Center, respondents in the 24-59 month range were 250 respondents (58.82) greater than respondents in the 0-23 month range, approximately 175 respondents (41.18%) (Ramadhan, 2020). This is because children have become active consumers at the age of 24-59 months, and they can choose their meals, such as random snacks, without regard for the type and cleanliness of food. This makes the child more prone to illness and causes the child's appetite to drop, putting the youngster in danger of stunting (Pranowo, 2021).

The majority of the respondents in the study were male, with 14 respondents (51.9%) in the case group and 13 respondents (48.1%) in the control group. According to a study conducted in the working region of the Gondangrejob Health Center, the population of toddlers consisted of 60 boys (60%) and 40 girls (40%). This study is consistent with previous research. It was also discovered that there were more male respondents, namely around 60 respondents (50.8%), compared to female respondents, namely about 58 female toddlers (49.2%), in the employment area of Health Center X Ogan Ilir Regency. This is because male toddlers in their first 1,000 days of life are more sensitive to malnutrition than girls. Male body size is larger, requiring more nutritional intake, and if nutritional intake is insufficient for an extended period, it can increase growth and development disorders (Asmirin et al., 2021; Marfuah, 2022).

According to the findings of the study, the majority of toddler caregivers were mothers, with 20 respondents (51.3%) in the case group and 19 respondents (48.7%) in the control group. The majority of the 175 respondents (97.2%) are carers for toddlers (Masrul, 2019). The role of the family, particularly mothers, in child care can have an impact on children's growth and development. Maternal parenting refers to the actions of a mother in nurturing and caring for her child. The way a mother cares for her children determines how well she manages the nutritional status of the children in her family (Anindita, 2018).

Received: 31-03-2023, Accepted: 30-05-2023, Published Online: 08-03-2024

1.2 The Implementation of Personal Hygiene in Families with Stunted and Non-Stunted Toddlers

According to the research, the caregivers, namely 16 respondents (61.5%), did not fulfil the standards with the number of case respondents. This research is consistent with that conducted in Kurma Village, Mapilli District, where it was discovered that the majority of respondents, especially in the case group of 48 respondents (81.4%), did not meet the standards in nail hygiene. Nail hygiene is one form of personal hygiene for a person, thus it is necessary to pay attention to nail hygiene, which is a breeding ground for bacteria that can adhere and create sickness, affecting toddler growth and development (Mia et al., 2021)

The majority of hand wash behaviours, namely 18 respondents (51.4%), did not fulfil the standards in the case group. This research is consistent with a study conducted in Kurma Village, Mapilli District, which discovered that the majority of carers in the case group in hand wash, with a total of 50 respondents (90.9%), did not match the standards (Mia et al., 2021). Using good soap will make children not susceptible to sickness (Permatasari et al., 2021). Hand wash practices that do not satisfy the standards will impact the mother's or caregiver's level of cleanliness when dealing with children and can make children susceptible to disease owing to transmission from unclean hands of mothers and utilised in directly caring for children. Mothers' or caregivers' failure to wash their hands can cause sickness in children, particularly in cases of stunting (Herawati et al., 2020).

The habit of bathing and changing clothing mainly met the standards, with 18 case respondents (50%) and 18 control respondents (50%) participating. This research is congruent, as research conducted in Palembang City discovered that respondents with good personal hygiene were 93 (93%) compared to respondents with poor personal hygiene, namely seven (7%). Personal hygiene is crucial for children's growth and development, as is the cleanliness of the body, food, and surroundings, all of which can help avoid the spread of diseases, particularly infectious ones that run the danger of depleting children's nutritional reserves and leading to stunting. It is important to practice good hygiene following health regulations, which include taking two daily showers and washing one's hands, feet, and hair (Bella et al., 2020).

With 19 responders (63.3% of the cases), the majority of defecation behaviors did not meet the standards. This study is consistent with that carried out in Kurma Village, Mapilli District, where in a total of 55 case respondents the majority of them had poor latrines (90.2%) (Mia et al., 2021). In addition to serving as a place to dispose of waste, latrines can also contaminate the environment and spread disease. Because dirt will inadvertently mingle with the water, toilets near clean water sources can contaminate those supplies. Bacteria can infiltrate a child's body and prevent nutrients from being absorbed, leading to a variety of illnesses including diarrhea that has a negative impact on children's nutrition, specifically stunting (Zahrawani et al., 2022).

With a total of 18 respondents, smoking is a habit that the majority of families with toddlers who are stunted have (54.5%). This study is consistent with research done in Cibatok 2 Village, Bogor Regency. With a total of 36 respondents (76.6%), researchers discovered that the family with the stunting condition had a history of smoking. Social environment, family, and close friends can all have an impact on someone's smoking behavior. Because of the toxic compounds in cigarettes, smoking can cause some ailments. Children who are exposed to cigarettes are most susceptible to the effects (Maulana & Rompone, 2020; Wati & Ridlo, 2020).

1.3 The effect of applying personal hygiene to the stunting occurrences

Based on data analysis using the Chi-square test, it was discovered that there was no correlation between nail hygiene and the prevalence of stunting (p-value = 0.08); however, when looking at the odds ratio, the OR value was 2.66 or OR> 1. This shows that nail hygiene who does not meet the standards has a risk of 2.66 times in the stunting group compared to those who meet the standards. This research was strengthened by research conducted in Kampa Sub-District, Kampar Regency, that there was no correlation

Received: 31-03-2023, Accepted: 30-04-2023, Published Online: 08-03-2024

between personal hygiene and the incidence of stunting with a p-value = 0.15 (p> 0.05) (Yolahumaroh & Afrida, 2022). This study supports research from the Balangkaan sub-district of the Agam Regency, which found no correlation between personal hygiene and the prevalence of stunting (p-value = 0.408) (Amalia et al., 2022). There is no correlation between personal hygiene and stunting; this might be attributed to variables from the amount of information, habit factors and a person's reaction in carrying out personal hygiene practices (Yolahumaroh & Afrida, 2022).

Although there is no significant correlation between nail hygiene and the incidence of stunting, in this study the results showed that carers who did not complete the standards for nail hygiene had 2.66 times the chance of suffering stunting. It can be easier for germs to grow in the nails when they are filthy, which can lead to health issues. Health problems that often occur are worm infections and diarrhea (Jamilatun et al., 2020). Bacteria and germs will nest in the nails and enter the body when eating. These germs can cause health concerns and can cause complications in the digestive system (Nurdin, 2018). Children will experience growth and developmental disruptions as a result, increasing their risk of stunting.

According to the research, out of 50 respondents who did not meet the standards for the hand wash habit, there were 18 respondents (51.4%) who were stunted toddlers. Based on the Chi-square test, there is no significant link between the hand wash habit and the incidence of stunting (p-value = 0.758) with an odds ratio (OR) of 1.21 or (OR> 1). similarly, there is no association between the hand wash habit and stunting since, in this study, there is a habit of defecating which has a higher influence on the prevalence of stunting. This research is reinforced by research conducted in the Work Area of the Kebunsari Health Center, Wonomulyo District, showing that there is no correlation between the habit of washing hands with soap and the incidence of stunting with a p-value = 0.73 (Permatasari et al., 2021). This research is in line with research conducted in the working area of the Harapan Baru Health Center, In Samarinda City, it was found that there was no correlation between the hand wash habit and the incidence of stunting with a p-value = 0.116 (> 0.05) (Herawati et al., 2020). This study differs from research done in the Gondangrejo Health Center's operating region, where it was discovered that handwashing with soap (hand wash) behavior and the prevalence of stunting in toddlers had a statistically significant correlation with a p-value of 0.041 (<0.05) (Marfuah, 2022).

The practice of hand wash that does not meet the standards will cause germs to be transferred from one person's hands to another, either through direct or indirect contact (Huliatunisa et al., 2020). Dirt and bacteria on hands can cause several diseases such as diarrhea, typhus, skin diseases, worm infections and malnutrition. The practice of hand wash that does not satisfy the standards will influence the quality of cleanliness of the mother or carer when interacting with children and can make the child susceptible to disease owing to transmission from unclean hands of the mother and utilised in taking care of the child directly. The lack of habit of washing hands by mothers or caretakers can cause sickness in children, especially in situations of stunting (Herawati et al., 2020). Hand wash that is carried out correctly will be effective in reducing the number of disease-causing microorganisms such as viruses, bacteria and other parasites that are on the hands (Kemensos RI, 2020).

As 51.4% of the case respondents in this study did not meet the hand wash standards, there is no correlation between hand wash practices and the prevalence of stunting. This figure is not too considerably different from the number of control responders, namely 48.6%. This is why there is no statistically significant link because the percentage of cases and controls is not too far away from the result in hand wash behaviors.

An odds ratio (OR) of 1 or (OR = 1) indicates that the habit of bathing and changing clothing is not associated with the incidence of stunting. There is no statistically significant correlation between the habit of bathing and changing clothes and the incidence of stunting (p-value = 1). This study is consistent with studies from the Balingka Sub-District in the Agam Regency, which found no correlation between personal hygiene and the prevalence of stunting (p-

Received: 31-03-2023, Accepted: 30-05-2023, Published Online: 08-03-2024

value = 0.408) (Brown et al., 2013). Research from the Sub-District of Kampa, Kampar Regency, which found no correlation between personal hygiene and the prevalence of stunting, supports this study with p = 0.15 (p>0.05) (Yolahumaroh & Afrida, 2022). There is no correlation between the habit of bathing and changing clothes to the incidence of stunting because a person's hygiene can be caused by the level of knowledge, culture and individual habits in carrying out good personal hygiene or not. Personal hygiene can be carried out utilizing skin care by bathing at least two times a day using clean water and soap, maintaining the cleanliness of the feet, hands and nails by cutting nails once a week and washing hands and feet using soap and cleaning clothes (Bella et al., 2020).

There is no correlation between bathing and changing clothes because the control group contains 50% of respondents who do not meet the standards for bathing and changing clothes, which is the same percentage as the case group, which contains 50% of respondents who do not meet the standards for bathing and changing clothes. In addition, this study found that most of the respondents had a habit of bathing and changing clothes that complied with the standards. This could be because one of the weather factors in the Limapuluh and Rumbai Bukit Health Centers' working areas was
hot and humid enough that the respondents were better at bathing and changing clothes.

There is a significant correlation between the habit of defecating and the incidence of stunting (p-value = 0.021), with an odds ratio (OR) of 4.03 or (OR> 1), indicating that defecation behaviors that do not meet the risk standards are 4.03 times more likely to be stunted than those who do. This study was bolstered by a study conducted at the Cicalengka Health Center, which discovered a significant correlation between the availability of healthy latrines and the incidence of stunting with a p-value = 0.004 (p 0.05). Other studies also obtained the same results, research conducted in Kurma Village found that there was a correlation between family latrines and stunting with a p-value = 0.029 (p <0.05) (Basyariyah et al., 2022; Mia et al., 2021).

Latrines that do not meet standards can cause infectious disorders such as helminthiasis and diarrhea owing to inadequate hygiene and sanitation and can interfere with the absorption of nutrients. Latrines that do not meet the standards will easily transmit faecal-oral infections from various media such as soil, water or vectors that carry feces. If the nutrient absorption process is disrupted it can cause growth disturbances in toddlers, which can lead to stunting.

There is no significant correlation between smoking habit and stunting (p-value=0.37), with an odds ratio (OR) of 1.71 or (OR>1). This shows that there are 1.71 risky smoking habits in the stunting group compared to those who do not have smoking habits. This research is in line with research conducted in Cibatok 2 Village, Kab. Bogor found that there was no correlation between family smoking habits and the incidence of stunting, with a p-value = 0.07 (p> 0.05) (Maulana & Rompone, 2020). Another similar study, namely research conducted in the City of Yogyakarta, found that there was no correlation between family smoking habits and the incidence of stunting. with a p value = 0.601 (p> 0.05) (Amalia et al., 2022). This research is not in line with research conducted in the work area of the Kintamani Health Center which states that there is an influence on the correlation between parental smoking behaviour and the occurrence of stunting with a p-value = 0.011 (<0.05) (Ayu et al., 2020).

Smoking behavior can influence the occurrence of stunting in children; this causes growth disorders in children as a result of children's exposure to harmful chemicals found in cigarettes (Ayu et al., 2020). Children are the ones who are most vulnerable to smoking exposure. The consequences can include preterm delivery, pneumonia, asthma, stunting, and, in the most severe cases, death in children (Maulana & Rompone, 2020)

There is no significant correlation between family smoking behaviour and the incidence of stunting because the percentage of case respondents who have a family smoking habit is 54.5%. These results are not far off from the 45.5% of control respondents who have smoking habits in the family. This is why there is no statistically significant association since the percentage of cases and controls

Received: 31-03-2023, Accepted: 30-04-2023, Published Online: 08-03-2024

is not too far different in terms of smoking behaviors.

1.4 The Effect of Simultaneous Application of Personal Hygiene on Stunting Occurences

According to the final modelling of the multivariate analysis, only respondents with defecation behaviors that did not meet the standards had a 4.03 times greater likelihood of having stunted children than respondents with the latter kind of behavior. From the calculations, it can be inferred that there will be a 63.3% chance of stunting in children if the respondent has a risk factor for improper defecation behaviors (probability value 0.633). Another 36.7% in this case is caused by other variables. This study is supported by research done in the Pangkajene City Health Center's Work Area, which demonstrates that the most prevalent factor that might induce stunting is latrine ownership. From the results of the multivariate final analysis, it was found that 6,289 respondents who did not have healthy latrines were at risk of experiencing stunting compared to respondents who had healthy latrines (Ilahi, Suryati, & Mediani, 2022). Research conducted in Peru stated that unsafe disposal of feces would cause diarrhea, helminthiasis and stunting. in toddlers. As a result, special care must be taken when disposing of feces in latrines that meet the standards. Research conducted in Sidoarjo revealed that there was a significant correlation between the use of unhealthy latrines and 7.3 times the risk of experiencing diarrhea. The use of healthy latrines can be influenced by knowledge, attitudes and ownership of latrines (Basyariyah et al., 2022; Brown et al., 2013).

Defecation behaviors that do not meet the standards will trigger disease in infants. If a toddler is prone to illness, particularly diarrhea, for an extended period, it will disrupt nutrient absorption in the digestive process. This will cause disturbances in growth and development in toddlers so the risk of toddlers experiencing stunting will increase. Feces are a source of disease transmission which can contaminate food, drink, water, soil and disease vectors such as cockroaches and flies. The existence of latrines close to clean water sources will indirectly cause dirt to mix with water, and latrines that do not meet the standards will cause water pollution which can pose a risk of disease, especially stunting (Asmirin et al., 2021; Basyariyah et al., 2022).

CONCLUSION

Open defecation has been proven to be a risk factor for stunting in children under five years among the other six independent variables.

The research data can be used by Posyandu cadres and Puskesmas officers to be able to conduct socialization related to proper defecation behaviors so that it can become a target for reducing stunting rates in the working areas of Puskesmas Rumbai Bukit and Puskesmas Limapuluh.

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