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ANALYSIS OF TODDLERS' MALNUTRITION INCIDENCE AND ADHERENCE TO CLEAN AND HEALTHY LIVING BEHAVIOR IN SEI KEPAYANG TIMUR HEALTH CENTER

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ABSTRACT

Background: Undernutrition is a health problem that has a long-term impact on child growth and development, which can occur due to insufficient intake or excessive energy use. One of the factors contributing to undernutrition is the failure to implement clean and healthy living behaviors (PHBS). However, the national PHBS achievement has only reached 39.1% and the prevalence of children with undernutrition in Indonesia has reached 7.5%. This study aims to determine the effect of PHBS on the incidence of undernutrition among toddlers in the Sei Kepayang Timur Community Health Center (CHC) area. **Methods:** This study is a quantitative analytical study involving 200 families with children under five years of age, selected incidentally. Data were collected using direct observation checklists and basic information questionnaires. **Result:** The majority of families in the Sei Kepayang Timur CHC work area (92%) still did not achieve PHBS, and 42% had children with undernutrition. Data analysis showed that overall PHBS was significantly associated with malnutrition ($p<0.05$). Among the ten PHBS indicators, only the second, third, fifth, and tenth indicators were found to influence malnutrition, with the tenth indicator being the most influential factor ($p<0.05$: OR: 3.855). **Conclusions:** Achieving clean and healthy living behaviors, such as exclusive breastfeeding, monthly weighing of infants, washing hands with soap and running water, and not smoking indoors, plays a crucial role in preventing malnutrition among infants.

Keywords: PHBS; undernutrition; child development.

INTRODUCTIONS

Undernutrition is a form of malnutrition characterized by a body weight that is more than two standard deviations below the standard growth curve of the World Health Organization (WHO) based on age and gender (World Health Organization). Clinically, undernutrition can be identified by relatively low weight compared to the height of children of a certain age.[1,2] Undernutrition, as a form of malnutrition, is one of the most common nutritional problems in poor and developing countries and accounts for more than 16% of deaths among children under five years of age, far higher than the mortality rate among infants caused by stunting.[1,3–7] Undernutrition, as a form of malnutrition, directly impacts children's health in both the short and long term. It disrupts physical growth and hinders cognitive development, which can affect cognitive abilities as adults. A systematic review of 30 studies on the impact of malnutrition on neurocognitive development, behaviour, and mental health in adulthood shows that malnutrition in childhood leads to cognitive decline, behavioral disorders, and mental health problems in adolescence and adulthood.[8] The systematic review also found that children who experienced moderate or severe acute malnutrition had lower academic achievement than children who never experienced malnutrition and suffered cerebral atrophy accompanied by ventricular dilatation.[9] Additionally, children with a history of malnutrition have lower self-esteem compared to children without a history of malnutrition.[10]

The 2022 Indonesian Nutrition Status Survey (SSGI) found that the prevalence of undernutrition in Indonesia in 2022 was 7.7%, an increase of 0.6% from 2021.[11] The 2022 SSGI also found that the province of North Sumatra had a prevalence of undernutrition above the national average, at 7.8%. The SSGI 2022 showed that Serdang Bedagai Regency had the highest prevalence of undernutrition in North Sumatra, at 12.6%, while the lowest prevalence was in Tapanuli Utara Regency, at 1.7%. Meanwhile, Asahan Regency had a prevalence of undernutrition above both the provincial and national averages, with a prevalence rate of 10.6%.[11] Unlike stunting, which has been the primary focus of the Indonesian government since 2019, undernutrition still receives little attention from both the government and researchers. Various studies have identified various risk factors for stunting, but no similar patterns were found for undernutrition. Theoretically, undernutrition can occur due to four main mechanisms: calorie intake deficit, increased calorie use, increased intake loss, and nutrient utilization disorders.[12] Complexly, undernutrition can also occur as a consequence of environmental factors such as limited access

to sanitation and clean water, limited access to adequate, healthy food and health facilities, and inadequate public policies to support the availability of good nutrition.[7] In addition to these factors, conflict or war is also among the most significant contributors to undernutrition in children. This factor is evident in the high reports of malnutrition, even severe malnutrition, among children in conflict-affected areas such as Yemen, Afghanistan, Gaza, and Sudan.[13–21] In Indonesia, in conflict-affected areas such as the mountainous regions of Papua, it is estimated that the number of children with poor nutrition ranges between 5%-15%.[22]

Since 1998, the Indonesian government, through its Indonesia Sehat 2010 vision and mission, has promoted Clean and Healthy Living Behaviors (Perilaku Hidup Bersih dan Sehat, or PHBS) to encourage healthy lifestyles among the general public. PHBS is a set of behaviors practiced based on awareness as a result of learning, enabling an individual, family, group, or community to take care of themselves (self-reliant) in the field of health and actively participate in achieving community health.[23] The implementation of PHBS is an important component carried out by the Indonesian government through the Ministry of Health to achieve various national health targets, including the Healthy Living Community Movement (Gerakan Masyarakat Hidup Sehat, GERMAS), the Healthy Indonesia Program with a Family Approach (Program Indonesia Sehat dengan Pendekatan Keluarga, PIS-PK), and the Active and Alert Village/Neighborhood Program (Desa/Kelurahan Aktif Siaga).[24] PHBS is also an important component of the Second Pillar of the National Strategy for Accelerating the Reduction of Stunting.[25] In this National Strategy, the target is for 70% of the Indonesian population to implement PHBS, with local governments responsible for its implementation. However, the results of basic health research over five years (2007, 2013, and 2018) show that the national PHBS achievement rate in Indonesia is still very low, at 11.2% (2007), 23.6% (2013), and most recently 39.1% (2018).[26]

The objective of this study is to determine the effect of PHBS on the incidence of undernutrition in Sei Kepayang Timur CHC.

METHODS

This study is a qualitative analytic study with a cross-sectional design. In March 2025, researchers conducted this study in the work area of the Sei Kepayang Timur Community Health Center (CHC) in Sei Kepayang Timur, Asahan Regency, North Sumatra, Indonesia. The population of this study is families with toddlers in the working area of Sei Kepayang Timur CHC. The total sample size in this study is 200, chosen using a non-probability sampling technique, purposive sampling. Researchers collected the data in this study through direct anthropometric measurements and an observation checklist (clean and healthy living behaviour checklist). Anthropometric measurement results were then plotted on the WHO growth curve standard to determine the nutritional status of the toddlers.

The data in this study were analyzed using a chi-square test and a binary logistic regression analysis. SPSS for Windows was used to perform the analysis.

The Health Research Ethics Committee of Universitas Prima Indonesia reviewed this study and its protocols, declaring them ethically appropriate in accordance with seven WHO standards (Letter No.079/KEPK/UNPRI/II/2025).

RESULTS

Among the 200 infants enrolled in this study, most were male (51.5%) and between two and five years old. Most mothers in this study only have primary education (56.0%) and are stay-at-home mothers (86.5%). Researchers found a similar educational pattern among infants' fathers, most of whom only had a primary education (57.0%). Most of the fathers worked as coconut plantation workers (94.5%). Most families in this study were three to four-person families (48.0%), slightly higher than five to six-person families (45.5%). However, a significant number of families involved in this study did not meet the regional income standard (92.5%).

In this study, the majority of families have not attained clean and healthy living behaviour (92%). Most also still did not breastfeed their baby exclusively (73.5%), did not regularly weigh their baby (59.5%), did not practice handwashing with soap and running water (68.0%), did not consume fruit and vegetables daily (67.0%), and persistently smoking indoors/inside the house (77.0%).

In a crosstabulation between family attainment of each PHBS indicator and its overall attainment with infant nutritional status, this study found that almost all PHBS indicator attainments have a significant relationship with infant nutritional status ($p<0.05$), except for the first indicator (labor assisted by healthcare workers) and the sixth indicator (using sanitary toilet) ($p>0.05$)

Table 1. Participants Sociodemographic Characteristics

	n	%
Sex		
Male	103	51.5
Female	97	48.5
Age		
<2 Years	56	28.0
2-5 Years	144	72.0
Mother's Education		
Primary	112	56.0

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Table 1. Participants Sociodemographic Characteristics

		n	%
Secondary		87	43.5
Tertiary		1	0.5
Mother's Occupation			
Stay at Home Mother		173	86.5
Teacher/Employee		11	5.5
Plantation Worker		16	8.0
Father's Education			
Primary		114	57.0
Secondary		84	42.0
Tertiary		2	1.0
Father's Occupation			
Teacher/Employee		11	5.5
Plantation Worker		189	94.5
Family Size			
3-4 People		96	48.0
5-6 People		91	45.5
>6 People		13	6.5
Household Income			
Below the regional standard		185	92.5
Equivalent to or above the regional standard		15	7.5
	Total	200	100.0

Table 2. Relationship Between PHBS Attainment and Infant Nutritional Status

	Nutritional Status						*p-value*
	Normal		Undernutrition		Total		
	n	%	n	%	n	%	
Labor assisted by healthcare workers (P-1)							
Yes	116	100.0	82	97.6	198	99.0	0.095
No	0	0.0	2	2.4	2	1.0	
Exclusive breastfeeding (P-2)							
Yes	49	42.2	4	4.8	53	26.5	0.000
No	67	57.8	80	95.2	147	73.5	
Monthly weighing of a baby under five years (P-3)							
Yes	64	55.2	17	20.2	81	40.5	0.000
No	52	44.8	67	79.8	119	59.5	
Using clean water (P-4)							
Yes	91	78.4	45	53.6	136	68.0	0.000
No	25	21.6	39	46.4	64	32.0	
Handwashing using soap and running water (P-5)							
Yes	64	55.2	0	0.0	64	32.0	0.000
No	52	44.8	84	100.0	136	68.0	
Using a sanitary toilet (P-6)							
Yes	97	83.6	68	81.0	165	82.5	0.624
No	19	16.4	16	19.0	35	17.5	
Mosquito abatement (P-7)							
Yes	77	66.4	34	40.5	111	55.5	0.000
No	39	33.6	50	59.5	89	44.5	
Daily fruit and vegetable consumption (P-8)							
Yes	53	45.7	13	15.5	66	33.0	0.000
No	63	54.3	71	84.5	134	67.0	
Daily physical activity (P-9)							
Yes	86	74.1	50	59.5	136	68.0	0.029
No	30	25.9	34	40.5	64	32.0	
Avoiding indoor smoking (P-10)							
Yes	42	36.2	4	4.8	46	23.0	0.000
No	74	63.8	80	95.2	154	77.0	
Overall PHBS							
Yes	16	13.8	0	0.0	16	8.0	0.000
No	100	86.2	84	100.0	184	92.0	

Table 4. PHBS Attainment Impact on Toddlers' Undernutrition

	p-value	OR	CI 95%	
			Lower	Upper
Step I				
P-1	0.999	0.000	0.000	
P-2	0.087	3.182	0.846	11.972
P-3	0.078	2.203	0.915	5.305
P-4	0.512	1.317	0.578	3.003
P-5	0.997	0.000	0.000	
P-7	0.942	0.968	0.410	2.285
P-8	0.673	1.259	0.432	3.668
P-9	0.760	0.884	0.400	1.955
P-10	0.070	3.417	0.905	12.908
Overall PHBS	1.000	0.092	0.000	
Constant	0.999	0.000		
Step VII				
P-2	0.084	3.166	0.858	11.689
P-3	0.024	2.540	1.134	5.693
P-5	0.996	0.000	0.000	
P-10	0.038	3.855	1.080	13.763
Constant	0.996	0.000		

Researchers conducted a binary logistic regression to assess the impact of the PHBS indicators attainment on the likelihood of developing undernutrition in infants within families. The overall model was significant, χ^2 (4) = 109.901, *p-value*< 0.001, and explained 56.9% of the variance (Nagelkerke R^2 = 0.569). Results showed that smoking indoors was a significant predictor of undernutrition (OR = 3.855, 95% CI = 1.08–13.763, *p-value* < 0.05). Weighing the baby under five every month is also found to be a significant predictor of undernutrition (OR = 2.540, 95% CI = 1.134–5.693, p-value < 0.05). Exclusive breastfeeding was found not to be a significant predictor of undernutrition (OR=3.166, 95% CI=0.858–11.689, *p-value*=0.084). Lastly, handwashing with soap and running water also did not predict infant undernutrition significantly (OR=0.00, *p-value*=0.996). The model demonstrated adequate fit (Hosmer-Lemeshow *p-value* > 0.05) and good predictive accuracy (AUC = 0.851, p-value < 0.001).

DISCUSSIONS

PHBS are a set of behaviors exhibited by communities to achieve a healthy life in its entirety. The achievement of PHBS, which involves attaining the ten indicators of PHBS, is a key component of every government program aimed at promoting public health, such as GERMAS, PIS-PK, and, in the last five years, the acceleration of stunting prevention.[24]

In this study, researchers found that the majority of participating families have incomes below the minimum wage of Asahan Regency. This data aligns with the findings of the North Sumatra Central Statistics Agency, which reported that 8% of the population in Asahan Regency is classified as poor. The Central Statistics Agency of North Sumatra also highlighted the educational landscape in Asahan Regency, where the majority of the population only completed primary or secondary education as their highest level.[27]

Overall, the achievement of clean and healthy living behaviors in the Sei Kepayang Timur CHC area was still only around 8.0%, far below the national target of 70%. Based on data from the second semester 2024 report on stunting in Asahan District, the achievement of clean and healthy living behaviors has reached 60%. However, according to the eMonev dashboard for stunting actions by the Ministry of Home Affairs, several indicators of clean and healthy living behaviors in Asahan District are still far from ideal, such as exclusive breastfeeding, which only reached 26.5%, daily consumption of fruits and vegetables at 33%, and the non-smoking rate at around 23%; far from the reported figure of 60% or the national target.[28,29]

The study aims to analyze the influence of clean and healthy living behaviors on malnutrition in the working area of the Sei Kepayang Timur CHC, Asahan Regency. The study found that a significant number of children were malnourished (42%). This finding differs slightly from the study in Mutiara CHC, which found that the malnutrition rate was only around 36.7%.[30]

This study found that the success in achieving all indicators of clean and healthy living (ten indicators) was associated with the nutritional status of young children in the family (p<0.001), although the effect was not significant (p>0.05). These results are consistent with a study in Sidorejo, Yogyakarta, which found that the success in achieving clean and healthy lifestyle indicators has a significant relationship with the nutritional status of infants, although the relationship is relatively low (p<0.005; r = 0.295).[31] Literature reviews also found a relationship between the achievement of clean and healthy living behaviors and children's nutritional status. Out of 11

research articles on this topic, nine found a significant relationship ($p<0.05$).[32]

In this study, researchers found that 99.0% of participating mothers gave birth with the assistance of health workers. This achievement is higher than the national average of 87.2% and the North Sumatra average of 85.6%.[33] This study found a relationship and influence between nutritional status, particularly undernutrition in children, and assisted childbirth by health workers and/or in health facilities. In general, there are no previous studies analyzing the relationship between assisted childbirth by health workers and the incidence of undernutrition, either in Indonesia or in other countries. However, data indicate that childbirth assisted by healthcare workers significantly impacts maternal mortality rates (MMR) and infant mortality rates (IMR). Therefore, researchers can deduce that the presence of healthcare personnel during childbirth can improve maternal and infant safety, thereby increasing the likelihood of infants receiving exclusive breastfeeding, where studies have proven that exclusive breastfeeding impacts not only the nutritional status of infants in the short term but also children's growth and development in the long term.[34,35]

According to WHO data, the rate of exclusive breastfeeding in Indonesia decreased from 69.7% in 2021 to 67.96% in 2022.[36] However, in the Sei Kepayang Timur CHC area, the percentage of children receiving exclusive breastfeeding was only around 26.5%, much lower than the percentage of children receiving exclusive breastfeeding in Asahan regency (63.26%).[28] This study found a relationship between exclusive breastfeeding and children's nutritional status, although the influence is not statistically significant. The findings of this study align with other studies that found exclusive breastfeeding as one of the main factors influencing children's nutritional status or the occurrence of malnutrition in children.[34,35,37–39] A scoping review found that exclusive breastfeeding not only provides nutrition for children but also regulates their nutrient intake. These benefits are because breast milk has a complex and balanced nutritional composition compared to formula milk, which is generally calorie-dense and can increase the risk of obesity in children. Different reviews also found that exclusive breastfeeding and continued breastfeeding after exclusive breastfeeding have protective characteristics against various infectious diseases. These protective characteristics against infectious diseases contribute to overall infant health because recurrent infections, particularly gastrointestinal and respiratory infections, are one of the factors causing malnutrition in infants and young children.[35]

Meanwhile, a literature review also supports the findings of this study, where various factors, including exclusive breastfeeding history, infection history, number of family members, and socioeconomic status, influence the incidence of malnutrition in infants.[38] In Indonesia, other studies have also found that exclusive breastfeeding is closely associated with the incidence of stunting in children.[40] This positive relationship between exclusive breastfeeding and nutritional status exists because it serves as the primary source of complete nutrition, providing both micronutrients and macronutrients, for infants up to six years of age. Thus, exclusive breastfeeding ensures that infants' nutritional needs are met. In this study, we observed that the majority of children did not receive exclusive breastfeeding, and among children with malnutrition, more than 90% did not receive exclusive breastfeeding. This finding is also supported by a study at Royal Prima Marelan Hospital, which found that exclusive breastfeeding is closely associated with stunting in infants, especially when complementary foods are available.[41]

Regular weighing and measuring of children's height/length aim to monitor their growth and detect early growth disorders. In Indonesia, health workers measure children's weight and height/length at Posyandu, which they hold periodically. Although the Posyandu program is free of charge for parents, the implementation rate of weight and height measurements in the Sei Kepayang Timur CHC area was only 40.5%, which is far below the national and provincial rates of 82.3% and 81.3%, respectively.[33] In this study, weight measurement and height measurement were found to be associated with nutritional status, but did not influence children's nutritional status. Weight and height measurements are essentially part of nutritional status assessment, allowing researchers to rationalize this significant association. However, these measurements do not influence nutritional status because they do not contribute to children's nutrient and energy intake or expenditure. However, these findings contradict another study that showed regular visits to Posyandu are closely associated with children's nutritional status.[42] The aforementioned study, conducted at the Amplas Community Health Center, also found that the majority of mothers with toddlers did not regularly visit Posyandu.[42] At Posyandu, there are several maternal and child health services, including child weighing (and filling out KMS), immunization, provision of supplementary food and supplements, and family planning services. Thus, the low Posyandu visit rate reflects the low child weighing rate as observed in this study.

The use of clean water in the Sei Kepayang Timur CHC area has reached 68%. Clean water is water that is colorless, odorless, and tasteless. The community in the Sei Kepayang Health Center's service area uses clean water from open wells and boreholes. Data from the Asahan District Development Agency found that in 2023, the percentage of residents with access to safe drinking water had only reached 40.25%.[43] The gap between clean water usage and access to safe drinking water exists because residents in the Sei Kepayang Health Center's area cannot categorize all the clean water they use as safe for drinking. This unsafe drinking water categorization is because open wells have the potential for contamination. This study found that clean water use is associated with children's nutritional

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status ($p<0.001$), but the association is not significant ($p>0.05$). This finding contradicts the findings of a study in the Pelem Village, Bojonegoro Regency, which did not find a significant association between access to clean water and children's nutritional status.[44] However, this study found that the availability of other sanitation aspects, such as sewage disposal systems, was associated with children's nutritional status. Nevertheless, there is a similarity between this study and the study in Pelem Village, as the majority of residents still obtain clean water from wells rather than from the local water supply company (PDAM). Since residents' wells are dug wells, the availability of sewage systems plays a very important role in preventing contamination of residents' groundwater supply. In a household setting, the availability of clean water is essential for consumption and personal hygiene. Clean water is very important not only because people can consume it and use it to clean food, clothing, the environment, and personal items, but also because unclean water can contain microorganisms that can cause disease. A systematic review of the relationship between clean water availability and diarrhea incidence found that clean water availability significantly influences diarrhea incidence, which is affected by recurrent diarrhea cases due to the consumption of unclean water.[45]

Although the use of clean water in the working area of the Sei Kepayang Timur CHC has reached 68%, the practice of hand washing with soap and clean running water is still very low (32%). During the COVID-19 pandemic, handwashing with soap and running water was frequently promoted because it was found to significantly reduce the risk of infection transmission.[46,47] Research has found that handwashing with soap and running water is associated with stunting in Central Sulawesi.[48] A systematic review of the impact of sanitation availability, clean water, and handwashing practices found that handwashing significantly influences stunting among infants.[49] Handwashing with soap and running water aims to ensure hygiene. This practice is not limited to individuals (children) but also extends to parents, especially those with young children who are still dependent on their parents for eating and drinking. If parents feed or prepare food for their children with unclean hands, the risk of the child contracting infections increases, potentially leading to poor health.

The use of proper latrines plays a crucial role in promoting public health, not only within families. One of the countries with the most serious sanitation problems is India, where in 2015 the rate of open defecation (defecation in open spaces) was as high as 60%, both in urban and rural areas.[50] This high rate of open defecation contributes to high rates of diarrhea and stunting in India. In 2000, only 32.72% of the population in Indonesia had access to adequate sanitation facilities (healthy toilets).[51] By 2024, the percentage of the Indonesian population with access to proper sanitation facilities had reached 83.6%.[51] Previous research found that adequate toilets significantly influence the incidence of diarrhea in infants ($p<0.05$).[52] A systematic review found that the availability of adequate sanitation facilities within the home significantly influences the incidence of malnutrition in children.[53] The aforementioned systematic review does not support the findings of this study, which found that access to adequate latrines is not associated with undernutrition ($p>0.05$). This difference is likely due to the relatively high availability of adequate latrines in the Sei Kepayang Health Center working area (82.5%), which is slightly lower than the percentage for North Sumatra province (88.8%).

As a tropical region, one of the health issues faced by the Indonesian population is mosquito-borne diseases. Dengue fever, dengue hemorrhagic fever, and malaria are among the most common mosquito-borne diseases found in Indonesia. One of the preventive measures against these diseases is mosquito larva control. This control involves preventing the formation of water stagnation or applying mosquito abatement powder to water storage containers or water bodies such as ponds and aquariums. In the Sei Kepayang Timur CHC area, only 55.5% of families conducted mosquito larva elimination. However, this study did not have comparative data at the Asahan District, North Sumatra Province, or national levels. Statistical analysis in this study found that mosquito larvae control is associated with the nutritional status of young children ($p<0.001$), but does not have a direct effect on nutritional status. Although no previous studies have analyzed the relationship between mosquito larvae control and nutritional status, researchers can infer this association from the impact of mosquito-borne diseases on overall individual health.

One of the most influential determinants of individual nutritional status, both in children and adults, is the availability of adequate nutritional intake. One aspect of nutritional intake in clean and healthy living behaviors is the daily consumption of fruits and vegetables. The consumption of fruits and vegetables aims to meet individual micronutrient requirements. However, in families within the Sei Kepayang Timur CHC working area, only 33% consume fruits and vegetables every day. This lower fruit consumption is likely due to limited access to fresh fruits and vegetables. The Sei Kepayang Community Health Center's working area consists mainly of coconut plantations, where most families work as laborers. These two factors influence households' ability to consume fruits every day. This study found that regular consumption of fruits and vegetables is associated with nutritional status, although it does not directly affect it. A systematic review found only a few studies showing the effect of fruit and vegetable consumption on malnutrition.[54] However, the same study emphasized that, in general, fruit and vegetable consumption plays a crucial role in preventing and minimizing the effects of undernutrition. The lack of a direct link between fruit and vegetable intake and nutritional status may be because fruits and vegetables are sources of micronutrients, not macronutrients. Low intake of fruits and vegetables is more closely associated with specific

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micronutrient deficiencies than with overall nutritional status.

The most significant finding of this study is the high rate of smoking inside the home (77.0%). This high rate of smoking inside the home reflects the current smoking situation in Indonesia, which is one of the countries with the highest number of active smokers in the world and the only country in Southeast Asia and one of six countries in the world, where the number of smokers continues to increase every year.[55] This high smoking rate is also evident in the 2023 Indonesia Health Profile data, which found that the average household expenditure on cigarette consumption ranks second after food and beverage expenses.[33] This high level of tobacco consumption, regardless of whether smoking occurs indoors or outdoors, imposes a financial burden on household finances and acts as a barrier to access to healthy and nutritious food. Statistical analysis in this study found that smoking habits are directly associated with and influence children's nutritional status within families ($p<0.05$; OR: 3.855 (95% CI: 1.080-13.763)). These findings align with various studies in Indonesia and other countries that also found that undernutrition and stunting are significantly influenced by smoking around young children.[56–59] A systematic review of 76 studies in South Asia also found that fathers who smoke around their children play a significant role in the occurrence of undernutrition in children.[60] One of the primary reasons for the significant impact of smoking habits on malnutrition is the increased risk of respiratory diseases in young children. Additionally, cigarette smoke contains combustion byproducts with hundreds of chemical compounds that are toxic to adults and even more harmful to young children.

CONCLUSIONS

Based on all the findings in this study, we can conclude that PHBS, particularly the second, third, fifth, and tenth indicators, determine the undernutrition status among infants, with the tenth indicator (avoiding indoor smoking) playing the most significant role.

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