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Analysis Of The Relationship Between Implementation Of STBM Program And Reduction Of Stunting's Risk Factors In Children Under Two Years Old In Palembang

Mariatul Fadilah
Public Health Community Health Department,
Faculty of Medicine, Sriwijaya University,
South Sumatera, Indonesia

Emma Novita
Public Health Community Health Department,
Faculty of Medicine, Sriwijaya University,
South Sumatera, Indonesia

Eddy Roflin
Public Health Community Health Department,
Faculty of Medicine, Sriwijaya University,
South Sumatera, Indonesia

Rizma Adlia Syakurah
Public Health Community Health Department,
Faculty of Medicine, Sriwijaya University,
South Sumatera, Indonesia

Pariyana
Public Health Community Health Department,
Faculty of Medicine, Sriwijaya University,
South Sumatera, Indonesia

Angela Irene
Medical Profession Program, Faculty of Medicine,
Sriwijaya University, South Sumatera, Indonesia
Jl. Dr. Muhammad Ali Komplek, Palembang, Indonesia

Abstract

Stunting, a condition of major nutritional deficiency in Indonesia is a nutritional problem during the first 1000 days of life, from the first day of pregnancy to the age of 2 years. Many studies link poor environmental sanitation to the incidence of stunting. To improve environmental sanitation, the Government of Indonesia issued Minister of Health Regulation No. 3 of 2014 in the form of a Community-Based Total Sanitation (STBM) program. STBM is carried out in 5 pillars, namely

stopping open defecation (SBABS), washing hands with soap (CTPS), managing drinking water and household food (PAMMRT), protecting household waste (PSRT), and protecting household liquid waste (PLCRT). This study aims to analyze the knowledge of the successful implementation of the STBM program with the risk factors for stunting of children under two years of age in the city of Palembang. This type of research, analytic observational and cross-sectional study design. Primary data were collected directly using a questionnaire. The average level of knowledge about STBM pillars and risk factors for stunting is in a good category. There is a significant relationship (p-value <0.05) between knowledge of SBABS and risk factors for infection in children, environmental sanitation, and availability of clean water; CTPS with risk factors for infection in children and the availability of clean water; PAMMRT with risk factors for infection in children and the use of biomass fuels; PSRT with risk factors for infection in children and environmental sanitation; and PLCRT with risk factors for infection in children, environmental sanitation, and availability of clean water. It is concluded that the pillars of PSRT and PLCRT have the most influence on the risk factors for stunting in Palembang City.

Keywords: Community-Based Total Sanitation, Stunting, Children under two years old

INTRODUCTION

Stunting is the most common form of nutritional deficiency in the world due to the accumulation of insufficient nutrients over a long period of time from pregnancy to 24 months of age. A child is considered stunting if the height-for-age score is below the 2nd percentile SD. Globally, in 2010 the prevalence of child stunting was 171 million children, of which 167 million occurred in developing countries. In 2017, this figure has decreased, reaching 150.8 million or 22.2% of children under five. This trend is estimated to reach 21.8% or 142 million by 2020. The highest number of children under five who are stunted is in Asia (55%). Indonesia is the third-largest contributor to the stunting rate in Southeast Asia. Based on data from Riskesdas, (2013), in Indonesia, around 37% of children under five are stunted. The highest prevalence is in East Nusa Tenggara (NTT) and the lowest is in the Riau Islands, Yogyakarta, DKI, East Kalimantan, and Bangka Belitung. In Palembang, there are still 404 children who have nutritional status below the red line, where the highest number is found in the working area of Puskesmas 11 Ilir. [1,2,3,4]

Stunting is closely related to nutritional problems during the first 1000 days of life, starting from the first day of pregnancy (± 270 days), the birth of the baby until the child's age reaches 2 years (± 730 days). This period is a sensitive period where the impact on the baby at this time will be permanent and cannot be corrected. Many studies say that there is a link between the availability of proper sanitation and the incidence of stunting. Research by Humphrey, (2009) states that subclinical environmental disease enteropathy has increased the permeability of the small intestine to become pathogenic while reducing the absorption of nutrients. One of the efforts to improve sanitation carried out by the government is The Community-Based Total Sanitation (STBM) program. [5,6,7,8,9,10]

STBM is a national policy based on Permenkes No. 3 of 2014. The STBM approach is carried out in 5 pillars, namely stopping open defecation, washing hands with soap, managing drinking water, and household food, protecting household waste, and protecting household liquid waste. According to the Ministry of Health, (2016), In Indonesia, the application of STBM has increased access to sanitation to 67.8% in 2016. South Sumatera is one of four provinces that has succeeded in reducing stunting rates in Indonesia. In South Sumatera, there has also been an increase in sanitation. Based on this, it is necessary to conduct research on the relationship between the successful implementation of the STBM program and the reduction in risk factors for stunting.

METHOD

This research is an analytical observational study that uses a cross-sectional study approach, while the data taken is primary data to analyze the relationship between the successful implementation of the STBM program and a reduction in risk factors for stunting. The population in this study were all households with under two years old children in the city of Palembang. Stunting occurs due to nutritional problems during the first 1000 days of life so that in this study selected children under two years old.

The dependent variable in this study is the STBM a program which includes the pillar of Stopping Open Defecation (SOD), Washing Hands with Soap (WHWS), Managing Drinking Water and Household Food (MDWHF), Protecting Household Waste (PHW), and Protecting Household Liquid Waste (PHLW). The independent variables in this study were risk factors for stunting which included maternal short stature, anemia during pregnancy, infection in mothers during pregnancy, gestational distance, gestational age, prematurity, LBW, infection in children, zinc deficiency in children, exclusive breastfeeding, environmental sanitation. availability of clean water, and the use of biomass fuels.

RESULT

Table 1 shows the distribution of the success of the Community-Based Total Sanitation (STBM) program, it was found that most of the subjects already had a good level of knowledge about the five pillars of the STBM.

Tabel 1. Distribution of the Success of Community-Based Total Sanitation (STBM) Program (n=393)

Pillars of STBM	N	%
SOD		
Good (76-100%)	369	93.9
Sufficient (56-75%)	23	5.9
Less (55%)	1	0.3
WHWS		
Good (76-100%)	371	94.4
Sufficient (56-75%)	19	4.8
Less (55%)	3	0.8
MDWHF		
Good (76-100%)	363	92.4
Sufficient (56-75%)	27	6.9
Less (55%)	3	0.8
PHW		
Good (76-100%)	349	88.8
Sufficient (56-75%)	40	10.2
Less (55%)	4	1.0

PHLW		
Good (76-100%)	356	90.6
Sufficient (56-75%)	34	8.7
Less (55%)	4	0.8

Table 2 shows the distribution of risk factors for stunting in Palembang, it was found that most of the subjects had a good level of knowledge about stunting risk factors.

Tabel 2. Distribution of Stunting Risk Factors in Palembang (n=393)

Stunting Risk Factors	N	%
Maternal Short Stature		
Good (76-100%)	238	60.6
Sufficient (56-75%)	64	16.3
Less (55%)	91	23.2
Maternal Anemia during Pregnancy		
Good (76-100%)	332	84.5
Sufficient (56-75%)	54	13.7
Less (55%)	7	1.8
Maternal Infection During Pregnancy		
Good (76-100%)	300	76.3
Sufficient (56-75%)	78	19.8
Less (55%)	15	3.8
Gestational distance		
Good (76-100%)	320	81.4
Sufficient (56-75%)	54	13.7
Less (55%)	19	4.8
Gestational age		
Good (76-100%)	337	85.8
Sufficient (56-75%)	47	12.0
Less (55%)	9	2.3
Prematurity		
Good (76-100%)	280	71.2
Sufficient (56-75%)	70	17.8
Less (55%)	43	10.9
LBW		
Good (76-100%)	270	68.7
Sufficient (56-75%)	72	18.3
Less (55%)	51	13.0
Infection in Children		
Good (76-100%)	274	69.7
Sufficient (56-75%)	77	19.6
Less (55%)	42	10.7
Zinc Deficiency in Children		
Good (76-100%)	347	88.3
Sufficient (56-75%)	44	11.2
Less (55%)	2	0.5
Exclusive Breastfeeding		
Good (76-100%)	332	84.5
Sufficient (56-75%)	52	13.2
Less (55%)	9	2.3
Environmental Sanitation		
Good (76-100%)	349	88.8

Sufficient (56-75%)	38	9.7
Less (55%)	6	1.5
Availability of Clean Water		
Good (76-100%)	348	88.5
Sufficient (56-75%)	41	10.4
Less (55%)	4	1.0
Use of Biomass Fuels		
Good (76-100%)	301	76.6
Sufficient (56-75%)	71	18.1
Less (55%)	21	5.3

Table 3 shows the distribution of the level of education of the subject, it was found that most of the subjects with a higher education level (diploma or equivalent programs, S1 or equivalent, and S2 or equivalent)

Tabel 3. Distribution of Education Level (n=393)

Education Level	N	%
Primary School or eq	12	3.1
Junior Hight School or eq	20	5.1
Senior Hight School or eq	145	36.9
Diploma Program or eq	55	14
Bachelor Program or eq	143	36.4
Master Program or eq	18	4.6
Total	**393**	**100**

Table 4 presents data that the subject who has a good level of knowledge for the pillar of SOD and infection in children are 96.7%.

Tabel 4. The Relationship Pillar of Stopping Open Defecation and Infection in Children (n=393)

Pillar of SOD	Infection in Children						*p value*
	Good		Sufficient		Less		
	n	%	n	%	n	%	
Good	265	96.7	68	88.3	36	85.7	0.001
Sufficient	9	3.3	9	11.7	5	11.9	
Less	0	0	0	0	1	2.4	
Total	274	100	77	100	42	100	

Table 5 presents data that the subjects who have a good level of knowledge for the pillars of SOD and environmental sanitation is 96%.

Tabel 5. The Relationship Pillar of Stopping Open Defecation and Environmental Sanitation (n=393)

Pillar of SOD	Environmental Sanitation						*p value*
	Good		Sufficient		Less		
	n	%	n	%	n	%	
Good	335	96	30	78.9	4	66.7	0.001
Sufficient	14	4	8	21.1	1	16.7	
Less	0	0	0	0	1	16.7	
Total	349	100	38	100	6	100	

Table 6 presents data that the subject who has a good level of knowledge for the pillars of SOD and the availability of clean water is 95.4%.

Tabel 6. The Relationship Pillar of Stopping Open Defecation and Availability of Clean Water (n=393)

Pillar of SOD	Availability of Clean Water						*p value*
	Good		Sufficient		Less		
	n	%	n	%	n	%	
Good	332	95.4	35	85.4	2	50	0.001
Sufficient	16	4.6	6	14.6	1	25	
Less	0	0	0	0	1	25	
Total	348	100	41	100	4	100	

Table 7 presents data that the subjects who have a good level of knowledge for the pillar of WHWS and infection in children is 97.1%.

Tabel 7. The Relationship between the Pillars of Washing Hands with Soap and Infection in Children (n=393)

Pillar of WHWS	Infection in Children						*p value*
	Good		Sufficient		Less		
	n	%	n	%	n	%	
Good	266	97.1	67	87	38	90.5	0.001
Sufficient	8	2.9	9	11.7	2	4.8	
Less	0	0	1	1.3	2	4.8	
Total	274	100	77	100	42	100	

Table 8 presents data that the subject who has a good level of knowledge for the pillar of WHWS and the availability of clean water is 96.6%.

Tabel 8. The Relationship between the Pillars of Washing Hands with Soap and The Availability of Clean Water (n=393)

Pillar of WHWS	Availability of Clean Water						*p value*
	Good		Sufficient		Less		
	n	%	n	%	n	%	
Good	336	96.6	33	80.5	2	50	0.001
Sufficient	12	3.4	7	17.1	0	0	
Less	0	0	1	2.4	2	50	
Total	348	100	41	100	4	100	

Table 9 presents data that the subjects who have a good level of knowledge for the pillar of MDWHF and infection in children is 96%.

Tabel 9. The Relationship Pillar of Managing Drinking-Water and Household Food and Infection in Children (n=393)

Pillar of MDWHF	Infection in Children						*p value*
	Good		Sufficient		Less		
	n	%	n	%	n	%	
Good	263	96	62	80.5	38	90.5	0.001
Sufficient	11	4	14	18.2	2	4.8	
Less	0	0	1	1.3	2	4.8	
Total	274	100	77	100	42	100	

Table 10 presents data that the subject who has a good level of knowledge for the pillar of MDWHF and the use of biomass fuels is 95.7%

Tabel 10. The Relationship Pillar of Managing Drinking-Water and Household Food and Use of Biomass Fuels (n=393)

Pillar of MDWHF	Use of Biomass Fuels						*p value*
	Good		Sufficient		Less		
	n	%	n	%	n	%	
Good	288	95.7	60	84.5	15	71.4	0.001
Sufficient	13	4.3	9	12.7	5	23.8	
Less	0	0	2	2.8	1	4.8	
Total	301	100	71	100	21	100	

Table 11 presents data that the subjects who have a good level of knowledge for the pillar of PHW and infection in children are 94.5%.

Tabel 11. The Relationship Pillar of Protecting Household Waste and Infection in Children (n=393)

Pillar of PHW	Infection in Children						*p value*
	Good		Sufficient		Less		
	n	%	n	%	n	%	
Good	259	94.5	58	75.3	32	76.2	0.001
Sufficient	15	5.5	17	22.1	8	19	
Less	0	0	2	2.6	2	4.8	
Total	274	100	77	100	42	100	

Table 12 presents data that the subjects who have a good level of knowledge for the pillars of PHW and environmental sanitation is 91.1%.

Tabel 12. The Relationship Pillar of Protecting Household Waste and Environmental Sanitation

Pillar of PHW	Environmental Sanitation						*p value*
	Good		Sufficient		Less		
	n	%	n	%	n	%	
Good	318	91.1	28	73.3	3	50	0.001
Sufficient	30	8.6	8	21.1	2	33.3	
Less	1	0.3	2	5.3	1	16.7	
Total	349	100	38	100	6	100	

Table 13 presents data that the subjects who have a good level of knowledge for the pillar of PHLW and infection in children are 94.9%.

Tabel 13. The Relationship Pillar of Protecting Household Liquid Waste and Infection in Children (n=393)

Pillar of PHLW	Infection in Children						*p value*
	Good		Sufficient		Less		
	n	%	n	%	n	%	
Good	260	94.9	62	80.5	34	81	0.001
Sufficient	14	5.1	14	18.2	6	14.3	
Less	0	0	1	1.3	2	4.8	
Total	274	100	77	100	42	100	

Table 14 presents data that the subjects who have a good level of knowledge for the pillars of PHLW and environmental sanitation is 92.8%.

Tabel 14. The Relationship Pillar of Protecting Household Liquid Waste and Environmental Sanitation (n=393)

Pillar of PHLW	Environmental Sanitation						*p value*
	Good		Sufficient		Less		
	n	%	n	%	n	%	
Good	324	92.8	28	73.7	4	66.7	0.001
Sufficient	25	7.2	9	23.7	0	0	
Less	0	0	1	2.6	2	33.3	
Total	349	100	38	100	6	100	

Table 15 presents data that the subjects who have a good level of knowledge for the pillars of PHLW and the availability of clean water is 92.5%.

Tabel 15. The Relationship Pillar of Protecting Household Liquid Waste and Availability of Clean Water (n=393)

Pillar of PHLW	Availability of Clean Water						*p value*
	Good		Sufficient		Less		
	n	%	n	%	n	%	
Good	322	92.5	32	78	2	50	0.001
Sufficient	25	7.2	8	19.5	1	25	
Less	1	0.3	1	2.4	1	25	
Total	348	100	41	100	4	100	

Table 16 presents the logistic regression multivariate analysis data with the Backward LR method.The final model consists of two influencing variables, namely the pillars of household waste management and household liquid waste protection against stunting risk factors with the Nagelkerke R Square Value = 0.117 = 11.7%, which means the 4th pillar (PSRT) and 5th (PLCRT) affect the risk factor for stunting by 11.7%.

Tabel 16. Results of Logistic Regression Multivariate Analysis with Backward LR Method (n=393)

	B	*P*	Exp(B)
4th Pillar (PHW)	1.332	0.000	3.788
5th Pillar (PHLW)	0.807	0.043	2.241

DISCUSSION

STBM is an approach to changing hygiene and sanitary behavior through community empowerment by means of triggering. Self-triggering is a way to encourage changes in hygiene and sanitation behavior of individuals or communities on their own awareness by touching feelings, patterns of thought, behavior, and habits of individuals or communities. Of the 393 primary data in the study population, the average level of knowledge on the implementation of the STBM program has shown good results with a percentage of 93.9% for the first pillar (Stop Open Defecation), 94.4% for the second pillar (Washing Hands with Soap), 92.4 % the third pillar (Managing Drinking Water and Household Food), 88.8% the fourth pillar (Protecting Household Waste), and 90.6% the fifth pillar (Protecting Household Liquid Waste).

The results of this study are inline with research conducted by Febriani (2016), it was found that most of the samples already had good or high knowledge in the application of the first pillar of STBM, namely stops open defecation. In addition, the research conducted by Risnawaty (2016) showed similar results to the research conducted, namely that 74.3% had good knowledge for the second pillar of STBM, namely washing hands with soap. The implementation of STBM in South Sumatra Province is considered successful, this is indicated by the receipt of the National Level STBM award by the Head of the South Sumatra Provincial Health Office in 2019, so that both the level of knowledge and implementation can be categorized as good, where this statement is in line with research conducted that in part the size of the STBM pillars, the level of sample knowledge was categorized as good. Then based on data from the 2019 South Sumatra Provincial Health Profile, it shows that in the percentage of drinking water quality that is supervised, Palembang City has almost met the 100% requirement.

Stunting is a chronic malnutrition problem caused by insufficient nutritional intake for a long time due to feeding that is not in accordance with nutritional needs. From 393 primary data in the study population, regarding the risk factors for stunting, it was found that the level of knowledge of stunting risk factors in Palembang was in a good category. The level of knowledge can be influenced by several factors, namely internal and external. One of the influencing internal factors is education, while external factors are environmental and socio-cultural factors. Based on research, one factor in influencing knowledge is education. In this study is higher education, which can be defined as the level of education after secondary education. Of the 393 samples, 55% had higher education, namely diploma and undergraduate programs. Based on the theory, education is one of the internal factors that will affect knowledge because higher education will make it easier for someone to receive information so that from the information obtained, the mother can understand how to care for her child in everyday of life so that the child is not at risk of stunting.

Of the 393 primary data in the study population, the average level of subject knowledge regarding the five STBM pillars associated with risk factors for stunting has shown a good level of knowledge, and based on the results of bivariate analysis shows that there is a significant relationship between the level of knowledge of the five STBM pillars and risk factors for stunting. In the research that has been conducted, it was found that the level of public knowledge about the first pillar of STBM, namely SOD which is associated with risk factors for infection in children, shows a good level of knowledge, which is 96.7% of the total population, this result is also similar to the second, third, fourth pillars. and fifth.

A good level of knowledge will have an impact on the application in everyday life, so that it can reduce the morbidity of the incidence of infections in children such as diarrhea, cold coughs, and worms which can cause growth and development problems in children. This result is supported by research conducted by Hafid et al., (2017), which states that of the 116 samples who applied SOD and WHWS, respectively, the percentage of the incidence of these diseases was very smaller than those who did not apply the STBM pillar. namely diarrhea 1.7%, cough 5.2%, and ISPA 0%. Based on research conducted by Chirande, L., et al., (2015), in Tanzania, where one of the other determinants is the management of drinking water that is not feasible is significantly related, where the OR value is 1.26 so that the consumption of drinking water is improperity can increase the risk of stunting.

In addition, uncovered fast food or food processing without washing hands first as well as poor waste protection can cause vectors such as flies to be around households that can contaminate food, where flies should not be around the household (management waste that is not good), this is supported in research which states that the fourth pillar of STBM, namely Protecting Household Waste (PHW) affects the risk factor for stunting by 11.7%, or our own hands can become carriers of microorganisms from feces to food and beverages which later can cause various diseases such as diarrhea, typhoid, parasitic disease, hepatitis A, and so on. If the child has frequent infections, it can cause enteral enteropathy which over time will cause stunting because the nutrients that should be used for the child's growth and development needs will be used if there is an infection, then all available energy intake will be used to fight the infection process in the child. Furthermore, wastewater that contains diarrhea-causing bacteria can enter clean water or food so that if bacteria enter the body it can cause infectious diseases in children. Therefore, repeated infection in children

is a risk factor for stunting. This statement is supported by the results of research which states that the fifth pillar (PHLW) affects the risk factors for stunting by 11.7%.

The second risk factor for stunting related to the level of knowledge of the STBM pillar is environmental sanitation. Most of the total population has a good knowledge of the pillars of the SOD, PHW, and PHLW. This result is supported by research conducted by Khairiyah et al., (2020) which states that groups of toddlers who are not stunted have individual sanitation facilities in good condition. Therefore, if the mother's knowledge is good and the application of STBM can be done optimally, it is hoped that the risk factors for stunting can be avoided.

The availability of clean water also plays an important role in determining the risk factors for stunting. From the research results obtained, the level of knowledge of the sample for the STBM pillar has been good if it is associated with risk factors for the availability of clean water. This result is in line with research conducted by Simanjuntak et al., (2018), which states that there is a significant relationship between the availability of clean water in the implementation of the SOD, WHWS, and PHLW pillars and the risk factors for stunting. Research by Syam et al., (2020) regarding factors that can increase the risk of stunting caused by the home environment is living conditions, insufficient supply of clean water and inadequate environmental hygiene carried out in Libya.

The level of knowledge of the sample regarding the pillars of MDWHF has a significant relationship with the use of biomass fuels as a risk factor for stunting, that is 95.7% of the samples have a good level of knowledge. The use of biomass fuels in the management of water and food in the household will produce smoke from combustion which has a detrimental effect on health which can impact on the mucosal irritation of the respiratory tract so that it is prone to Acute Respiratory Infections (ARI). In a study conducted by Halim et al., (2018), stated that respiratory infections also often attack children under five because of their immunity, so that children under five with risk factors for stunting have a larger proportion of ARI.

CONCLUSION

Based on research on Analysis of The Relationship Between Implementation of STBM Program and Reduction of Stunting's Risk Factors in Children Under Two Years Old in Palembang, it can be concluded that the average of all STBM program pillars has shown success where the highest level of good knowledge is in all STBM pillars. The average of the risk factors for stunting shows that the level of knowledge of the risk factors for stunting in Palembang is in the good category for all risk factors. There is a significant relationship between the level of knowledge on the pillars of SOD with risk factors for infection in children, environmental sanitation, and availability of clean water; WHWS pillar with risk factors for infection in children and the availability of clean water; MDWHF pillars with risk factors for infection in children and the use of biomass fuels; pillar of PHW with risk factors for infection in children and environmental sanitation; as well as the PHLW pillar with risk factors for infection in children, environmental sanitation and availability of clean water. There are two pillars, namely the pillars of PHW and PHLW which most influence the risk factors for stunting in Palembang.

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