

Household Food And Water Processing Models To Reduce Stunting Prevalence In Toddlers In Indoneisa

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ABSTRACT

Stunting (suboptimal linear growth, defined as a Z-score below 2 standard deviations (SD) of the median WHO child growth standard for height / age) is the most common form of child malnutrition, affecting an estimated 150.8 million children under age 5 (22.2 percent) worldwide in 2017. The purpose of this study was to find a model of reducing the prevalence of stunting of children under five in Palembang in terms of the Health Belief Model through food processing and household drinks. This type of research is observational analytic research and cross-sectional study design. The population in this study were all mothers of children under five (0-59 months) who examined their children in the working area of the Palembang city health center. each increase in 1 unit of vulnerability perception increases 0.226 units of household food and water processing behaviour (p value = 0.001). The perception of seriousness shows no significant correlation with the estimated value of 0.033 (p value = 0.269). On the perception of benefits, each increase of 1 unit will increase 0.123 units of household food and water processing behaviour (p value 0.001). Obtained the perception of obstacles not significantly correlated with household food and water processing behaviour with a p-value of 0.342. The acting signal component also shows the results that there is no significant correlation with household food and water processing behaviour with a p-value of 0.113. Every increase of 1 unit of ability / efficacy increases 0.570 units of household food and water processing behaviour (p value = 0.001). In this study it was also found that there was no significant correlation of household food and water processing behaviour with stunting in Palembang with a p value of 0.511. In conclusion, the perception of vulnerability and ability / efficacy shows a positive correlation with household food and water processing behaviour and the component of

cues to act that most influences household food and water processing behaviour is self-awareness.

Keyword: Stunting, household food and water processing, Health Belief Model.

INTRODUCTION

Failure to optimally grow and develop early in life has a sizable economic impact on a country.¹ Ending stunting is crucial in the progress of a country. Stunting increases the risk of death, affects motor and cognitive development, decreases school performance, increases the risk of excess nutrition and non-communicable diseases, and reduces productivity in later adulthood.² This accumulative effect is detrimental to African and Asian countries to 11% of national products their gross.¹ The World Health Assembly has supported global nutrition targets including one to reduce the number of children who are stunted by infants by 40% by 2025. These targets have been included in the Sustainable Development Goals (SDG target 2.2) .³

Stunting (suboptimal linear growth, defined as a Z-score below 2 standard deviations (SD) of the median WHO child growth standard for height / age) is the most common form of child malnutrition, affecting an estimated 150.8 million children under age 5 (22.2 percent) worldwide in 2017.⁴ Riskesdas data showed that stunting cases were relatively stagnant at around 36.8% (2007) and reached 37.2% (2013) of 33 provinces in Indonesia.⁵ In several provinces in Indonesia it was found that stunting rates for toddlers namely DIY (22.5%) and NTT (58.4%) showed an imbalance and development that were properly separated.⁵ The prevalence of LBW according to Riskesdas was 11.1% (2010) and 10.2 (2013); the proportion of short births (<48 cm) is 20.25% (2003) .⁶

Stunting that occurs in developing countries starts from the growth and development of the fetus in the womb and its severity rises to a peak at around two years or a time period called "1000 days" .⁷ In particular, a recent meta-analysis of 42 studies shows that complementary feeding practices to overcome chronic malnutrition are best able to correct about a third of the growth deficits encountered.⁸ These findings indicate that other factors may be involved in stunting. Factors that have been associated with stunting include poor hygiene and sanitation and recurrent gastrointestinal infections.⁴

One factor that has the potential to cause stunting is poor environmental conditions such as food and drinks that are not safe or not processed beforehand and related intestinal health. Poor environmental health will have an impact on intestinal environmental dysfunction, one of which is diarrhea which adversely affects nutritional status and changes in intestinal morphology, reduced absorption, and impaired barrier function.⁹ It is postulated that EED develops throughout infancy as a result of chronic fecal-oral exposure to enteropathogens because living in poor environmental sanitation conditions.¹⁰ Processing food and drinking water is important because water intake is much higher for babies than other age categories. Sources of high intake include foods such as concentrated juice, cereals, and formula milk mixed with water before consumption. Therefore, water should be the main consideration in estimating the risk of exposure to pesticides for infants and children.¹¹ So that the intake of contaminated water and food will be very risky to the child's

growth and development status. Research shows that there is a relationship between improving the quality of household drinking water and the nutritional status of children

The factors that cause stunting in children under 5 vary greatly according to age and are ecologically related to each other. Among them, environmental factors in the household, namely, household food security and a healthy household environment, play an important role in preventing long-term stunting.¹² Household environments related to child nutrition consist of children's health and food selection, and household socioeconomic status.¹³ Environmental factors in this household contribute to the neglect of children's needs, especially their nutritional status from birth to preschool. This study aims to find a model of reducing the prevalence of stunting of children under five in Palembang in terms of the Health Belief Model through food processing and household drinks.

METHOD

This type of research is observational analytic research and cross-sectional study design. The population in this study were all mothers of children under five (0-59 months) who examined their children in the working area of the Palembang city health center. The sampling process in this study applies a consecutive sampling technique in which every subject that meets the inclusion criteria is included in the study until the minimum sample size is met within a certain period of time. Inclusion criteria in this study are respondents willing to take part in research and respondents can communicate well. Exclusion Criteria are children who have physical and / or mental disabilities, children who have chronic disease and / or congenital diseases, children who have a history and / or are taking steroid drugs for a long time, and children from parents with a history of short stature. The types of data used in this study are primary and secondary data. Primary data were obtained using a questionnaire containing questions about the variables contained in the HBM theory and open defecation behaviour.

The questionnaire was filled out after signing the informed consent and hearing an explanation of how to fill out the questionnaire by the researcher. The questionnaire used was a self-completed questionnaire in which respondents filled out the questionnaire provided by researchers and secondary data was obtained using the KMS (Card to Health) book containing children's health records in the form of children's growth and development charts. Analysis of the model of reducing the prevalence of stunting of children under five in the city of Palembang in terms of the Health Belief Model in the household liquid waste security program using Path Analysis.

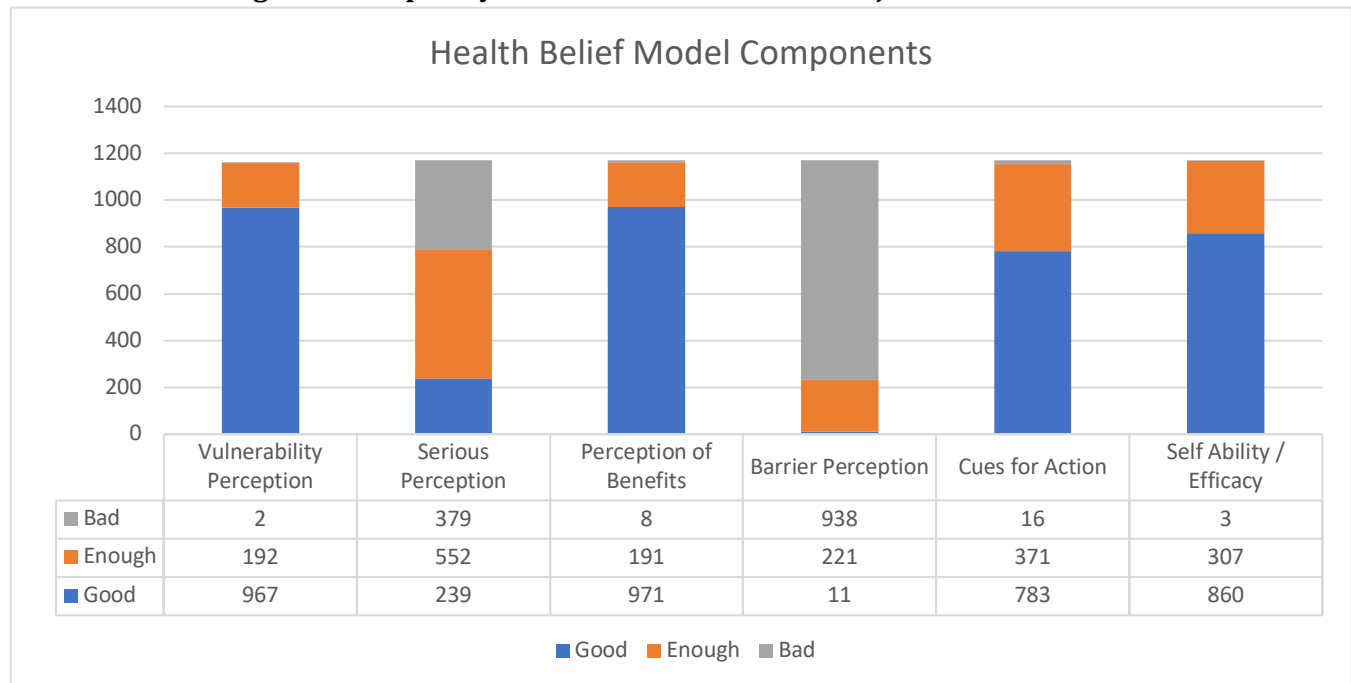
RESULT

In this study, research subjects were 52.6% male and 47% female. The population is most vulnerable at the age of 13-25 months (38.9%). In this study found that children who experienced stunting as much as 17.9%. Most parents of toddler education is graduated from high school (53.2%). A total of 923 research subjects have performed good household food and beverage processing behaviour.

Based on the perception of vulnerability as much as 83.4% of research subjects have a good perception of vulnerability. As many as 47.2% of research subjects have sufficient seriousness perception. 83% of research subjects have a good perception of the benefits. Based on the

perception of obstacles 80.2% of research subjects have less obstacles. 66.9% of research subjects have a signal to act well and 73.5% of research subjects have the ability or good self-efficacy.

Figure 1. Frequency distribution of research subjects based on HBM



The path analysis model that is made is checked for compatibility with the variable relationship model using the SPSS AMOS 24 application (figure 2). The indicators used to determine the suitability of the model in the path analysis can be seen in table 4.8. Obtained results of CMIN / DF 7,228, CFI of 0,709, NFI of 0,679, and RMSEA of 0.073.

Figure 2. Standardized Structural Model

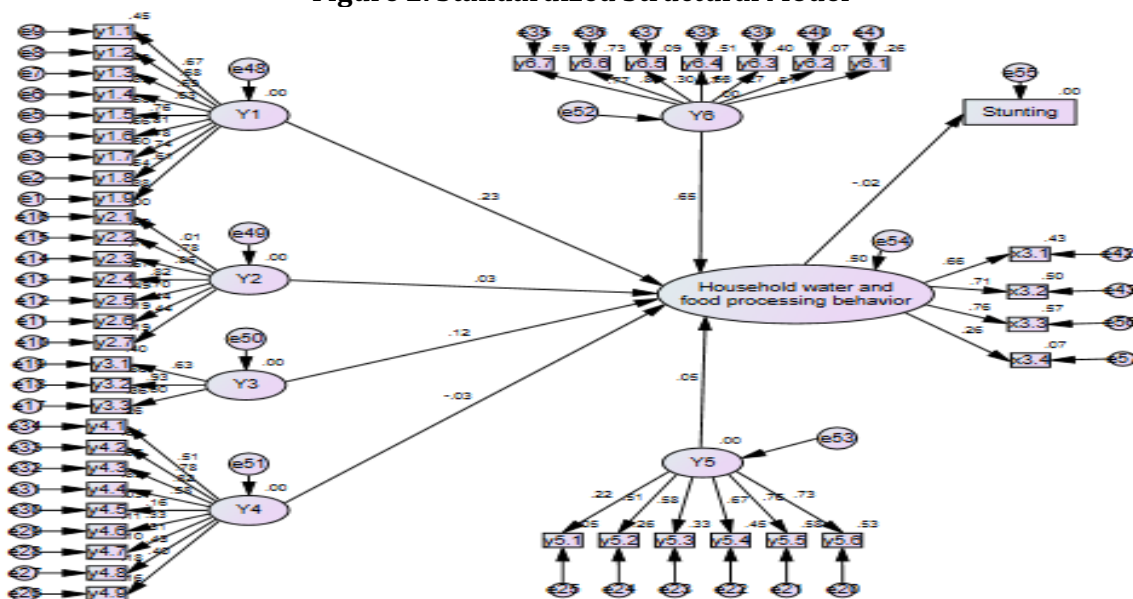


Table 1 shows the standardized path coefficient between the perception of vulnerability and Household food and water processing behaviour 0.226 p-value = 0.001 so that each increase of 1 unit of vulnerability perception increases 0.226 units of Household food and water processing behaviour. The perception of seriousness shows no significant correlation with the estimated value of 0.033 (p value = 0.269). On the perception of benefits, each increase of 1 unit will increase 0.123 units of Household food and water processing behaviour (p value 0.001). Obtained the perception of obstacles does not significantly correlate to Household food and water processing behaviour with a p-value of 0.342. The acting signal component also shows the results that there is no significant correlation with Household food and water processing behaviour with a p-value of 0.113. Every increase of 1 unit of ability / efficacy increases 0.570 units of Household food and water processing behaviour (p value = 0.001). In this study it was also found that there was no significant correlation of Household food and water processing behaviour with stunting in Palembang with a p value of 0.511.

Table 1 Results of path analysis of applying the Health Belief Model to the factors that influence stunting in infants.

Dependent	Independent	Unstandardi zed path coefficient	S.E	p	Standardized path coefficient
Household food and water processing behavior	Vulnerability Perception (Y1)	0.210	0.030	0.001	0.226
Household food and water processing behavior	Serious Perception (Y2)	0.028	0.025	0.269	0.033
Household food and water processing behavior	Perception of Benefits (Y3)	0.109	0.027	0.001	0.123
Household food and water processing behavior	Barrier Perception (Y4)	-0.028	0.029	0.342	-0.029
Household food and water processing behavior	Cues for Action (Y5)	0.033	0.021	0.113	0.652
Household food and water processing behavior	Self Ability / Efficacy (Y6)	0.570	0.037	0.001	0.050
Stunting	Household food and water processing behavior	-0.021	0.032	0.511	-0.022
N Observation =	1106				
Model Fit					
CMIN/DF	7.228				
CFI	0.709				
NFI	0.679				
RMSEA	0.073				

Table 2 shows the cues to act because they got initiative from themselves correlated with Household food and water processing behaviour of 0.126 (p value = 0.001). The other five components, namely getting family support, getting information from neighbours, getting information from health education, getting written information from brochures, pamphlets, or posters, and getting information through multimedia and the internet do not significantly correlate with Household food and water processing behaviour

Table 2. Regression Analysis Components of the cues act with a Household food and water processing behaviour

			Estimate	S.E.	C.R.	P
Household food and water processing behaviour	<---	Y5.1 (Self Awareness)	.126	.025	5.066	***
Household food and water processing behaviour	<---	Y5.2 (Family Support)	.043	.029	1.465	.143
Household food and water processing behaviour	<---	Y5.3 (Information from neighbours)	.042	.018	2.378	.017
Household food and water processing behaviour	<---	Y5.4 (Information from Health Education)	.002	.022	.070	.944
Household food and water processing behaviour	<---	Y5.5 (Information from written rules)	.012	.018	.680	.496
Household food and water processing behaviour	<---	Y5.6 (Information from multimedia)	.021	.019	1.103	.270

DISCUSSION

In this study, the results of each increase in 1 unit of vulnerability perception increase 0.226 units of Household food and water processing behaviour. The perception of seriousness shows no significant correlation with the estimated value of 0.033 (p value = 0.269). On the perception of benefits, each increase of 1 unit will increase 0.123 units of Household food and water processing behaviour (p value 0.001). Obtained the perception of obstacles does not significantly correlate to Household food and water processing behaviour with a p-value of 0.342. The acting signal component also shows the results that there is no significant correlation with PAMMRT behaviour with a p-value of 0.113. Every increase of 1 unit of ability / efficacy increases 0.570 units of Household food and water processing behaviour (p value = 0.001). In this study it was also found that there was no significant correlation of Household food and water processing behaviour with stunting in Palembang with a p value of 0.511.

Different results were found in Mahmudiono's research conducted in Surabaya, Indonesia, which is found that there is a correlation between food insecurity and stunting.¹⁴ Different results can occur due to differences in data collection techniques and population differences. Most staple foods in developing countries are rich in carbohydrates, such as rice, corn, cassava, sweet potatoes, and plantains. This food must be cooked with extra water. During the starch cooking and gelatinization process, carbohydrates absorb an adequate amount of water. This results in an increase in the volume of starch granules with an increase in viscosity and a decrease in energy density. Characteristics of these foods are high water content, high viscosity, and consistency like a thick paste. Food processing in developing countries thus poses several challenges.¹⁵

There is research that supports the results of this study, namely research conducted by Johri in India. In the study it was found that the improvement in water quality has the potential to reduce the proportion of underweight children, but it is unlikely to have an impact on stunting. In that study it was observed that safer water might be related to height for age, but the impact was not large enough to modify the clinical stunting in this sample.⁴ Research conducted by Null on the population of infants in Kenya also obtained the same results. In this study, an increase in household drinking water treatment did not reduce the incidence of diarrhea and improved toddler growth.¹⁶ The results of this study contrast with some systematic reviews that have found significant protective

benefits from water, sanitation and hygiene interventions (including hand washing) in diarrhea in the efficacy test. The results of other trials also did not show the effects of improved sanitation on diarrhea, although differences in context and interventions made it difficult to compare these trials.^{17,18} Improving sanitation is very important for public health without considering the possible impact on stunting of children. Improved access to clean drinking water, hand washing, toilet use can prevent a large burden of infectious diseases that include diarrheal diseases but also other important infectious diseases. Diarrheal disease, which includes a variety of bacterial, viral and protozoan infections, and can largely be prevented by increasing access to clean drinking water, washing hands and using healthy toilets, ranked fourth as the leading cause of global disability in 2010, after heart disease ischemic, respiratory infections and lower strokes.¹⁹ In a randomized control trial in India conducted by Pickering obtained similar results that there was no significant difference in the areas that received intervention to improve drinking water facilities with control areas for the incidence of diarrhea.^{20,21}

A multi-center study found that drinking water treatment has a smaller effect compared to increased access to toilets to prevent stunting in the under-fives population in Vietnam.²² Three biological mechanisms, in particular, have been described that link drinking water quality, hand washing and use poor toilets with direct malnutrition: (1) through repeated diarrhea attacks, (2) infections transmitted through earthworms, *Ascaris lumbricoides*, *Trichuris trichiura*, *Ancylostoma duodenale*, and *Necator americanus*; and (3), a subclinical condition of the intestine, called various tropical enteropathies, environmental enteropathies or, most recently, and as used herein, intestinal environmental dysfunction (EED). For each of these, WASH's effects on malnutrition are mediated by exposure to toxic substances and symptomatic or asymptomatic infections.¹⁰

Stunting is a complex problem and is influenced by many structural factors and determinants such as caregiver gender, age, water sources, and behavioural practices around hand washing. Demographic and social factors such as the child's age and caregiver's gender also contribute to the fact that stunting is complex. While eliminating stunting will not be overcome by addressing these factors alone.²³⁻²⁴ In the signaling component of action there is a correlation between community initiatives on Household food and water processing behaviour. This shows that the community already has introspection on the cleanliness of food and drinks in the household.

This study has limited data collection using questionnaires which are directly filled in by research subjects. The data obtained in this study are subjective because researchers do not directly check the environmental and household conditions of research subjects. In this study the questionnaire to measure Household food and water processing behaviour was less reliable in the study population.

CONCLUSIONS

In conclusion, the perception of vulnerability and ability / efficacy shows a positive correlation with Household food and water processing behaviour and the signaling component to act that has a significant positive correlation to Household food and water processing behaviour is self-awareness. From the results of this study it can be suggested to improve the delivery of information to the community individually about the importance of food processing and household drinks.

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