

MODEL OF ENVIRONMENTAL ARRANGEMENT FOR PREGNANT WOMEN IN EARLY PREVENTION OF STUNTING USING STRUCTURAL EQUATION MODELING (SEM) APPROACH

ERPITA YANTI*, YESSY APRIHATIN, APRIZON PUTRA, ABDUL RAZAK

Universitas Negeri Padang, Indonesia.

*Corresponding author: yantierpita@fik.unp.ac.id

<http://doi.org/10.46754/jssm.2024.04.010>

Submitted final draft: 2 November 2023

Accepted: 14 December 2023

Published: 15 April 2024

Abstract: The purpose of this research is to find a model for environmental arrangements for pregnant women in the early prevention of stunting with a case study in Padang Pariaman Regency - West Sumatra. The method used in this research is the Structural Equation Modeling (SEM) approach because SEM is a set of statistical techniques that allows the measurement of a series of relatively “complicated” relationships simultaneously. The sample in this study was made up of 112 people who were in Padang Pariaman Regency. Before performing analytical techniques using SEM, the data was processed electrically to identify the frequency distribution of the research. The results showed that the ability of the families’ behaviour variable to explain the variance of each variable was 45.6% for the level of education, knowledge, actions, and behaviour of the pregnant women’s families and a value of 54.4% for other factors influence. After researching and based on theory, other factors that influence early prevention of stunting in Padang Pariaman Regency are attitude, motivation, family support, and the role of health workers.

Keywords: Stunting, SEM, family, pregnant women, environment arrangement.

Introduction

Stunting or short stature is a growth disorder that is mostly caused by chronic nutritional problems from infancy in the womb to the early period of the child’s birth, which usually appears after the child is 2 years old (Scheffler & Hermanussen, 2022). According to Dewata *et al.* (2023), short or stunted toddlers can be identified if a toddler’s length or height has been measured and then compared to a standard, and the results of these measurements are in the below-normal range. In children under 5 years old, this condition reflects a failure to thrive due to chronic malnutrition, so children become too short for their age. Chronic malnutrition occurs when the baby is in the womb until the age of 2 years. Thus, the first 1000 days of life should receive special attention because it determines a person’s physical growth, intelligence, and productivity in the future.

This condition is one of the main nutritional problems faced today. The problem of stunting has quite serious impacts, including 1) short-term associated with morbidity and mortality in infants/toddlers, medium-term associated

with low intellectual and cognitive abilities, and 2) the long-term associated with the quality of human resources and degenerative disease problems in adulthood (Raiten & Bremer, 2020; Ali, 2021). Children are the nation’s assets in the future. One can imagine how the condition of human resources in Indonesia in the future will be if there are currently many Indonesian children who are stunted. This nation will not be able to compete with other nations in facing global challenges. If stunting growth can be prevented, it is hoped that economic growth will be better without being burdened with the cost of treating degenerative diseases.

Stunting toddlers experience chronic nutrition caused by many factors, such as lack of nutritional intake in infants, maternal nutrition during pregnancy, and socioeconomic conditions (Yanti & Aprihatin, 2021). Barahima *et al.* (2019) and Dewata *et al.* (2022) added that stunting is not only caused by poor nutrition experienced by pregnant women and children under five. The most decisive intervention to reduce the prevalence of stunting is carried out

in the first 1,000 Days of Life (HPK) of children under five. Health services include antenatal care (ANC) (health services for mothers during pregnancy), quality early learning, and lack of family access to nutritious food, clean water, and sanitation. Studies by Win *et al.* (2020) in Dhaka and Bangladesh show that children born with low birth weights (LBWs) have the potential to become malnourished and even worse off. Therefore, pregnant women's nutrition and health status are very important determinants of stunting.

According to the Ministry of Health of the Republic of Indonesia report in Booth (2019) and Masrul *et al.* (2020), one of the provinces that has the highest stunting rate in Indonesia is West Sumatra. The West Sumatra Health Office reported that from 2015 to 2018, the number of stunting under-fives was always above 20%. Judging from the data of Research of Basic Health (RISKESDAS) 2018, the stunting rate in West Sumatra Province reached 30% of all children under five. One of the areas that have the largest stunting rate is Padang Pariaman Regency. This area is ranked number 3 highest in West Sumatra. Based on the weighing of infants under five years of age (toddlers), in 2018, it was estimated that as many as 5,862 (19%) toddlers experienced a disorder in the form of stunting, where there were 26.3 % of short children and 12.9 % of very short children.

This research broadly studies the role of the family, especially the husbands of pregnant women, in the early prevention of stunting in Padang Pariaman Regency - West Sumatra Province. Based on a survey conducted at several health centres in Padang Pariaman Regency, out of 10 pregnant women who came to check their pregnancies, only 4 pregnant women were escorted by their husbands, and 6 pregnant women came unaccompanied by their husbands even though 4 of them they experience disturbances/discomforts such as nausea and dizziness. Even if there is a husband who always takes his wife to the health service but doesn't listen when his wife is being examined, he chooses to wait outside the room.

Genetic and environmental factors are also some of the biggest factors that can trigger stunting. In 2019, Yadika *et al.* (2019) stated that 90% of stunting was influenced by the environment and 10% by heredity. One of the environmental factors that influences it is the family. The family has a crucial role in preventing and treating stunting because it is a determining factor in how we try to prevent and treat disease. The family also plays an important role in every phase of life, starting from the fetus in the womb (Browne, 2016), as well as providing education to pregnant women about the importance of examining the condition of pregnancy to health workers.

In addition, one of the conditions in the environment that pays little attention to the health of pregnant women is the habit of smoking at home, especially in the family of pregnant women (Karatay *et al.*, 2010). The results of a study by Hackshaw *et al.* (2011) stated that in the umbilical cord serum of non-smoker women exposed to cigarette smoke, cotinine (a metabolite of nicotine) was found to be 2.76 ng/ml. In women who smoke, cotinine was found to be 59.33 ng/ml. This can cause delays in the growth and development of children, thus triggering stunting. One of the factors in the family environment that can also trigger stunting, according to Almatsier (2010) and Setia *et al.* (2010), is the lack of knowledge and attitudes of family or husband regarding health care for pregnant women and the low level of education of family or husband. Therefore, efforts to arrange the environment are important so that they can empower the family or husband of pregnant women. There have been many efforts made by the government to reduce the stunting rate in Indonesia.

To overcome the above, it is necessary to know the many factors that are influenced by the actions of the family or husband towards pregnant women for early prevention of stunting in those analysed using the Structural Equation Modeling (SEM) method. The purpose of this research is to find a model for environmental arrangements for pregnant women in the early

prevention of stunting with a case study in Padang Pariaman Regency - West Sumatra. This method analyses not only the direct relationship but also the indirect relationship in the causal relationship model between variables so that factors that influence stunting in pregnant women can be added more accurately. The novelty of this research is to determine the direct influence of family or husband's knowledge and the indirect influence of family or husband's actions on the behaviour of pregnant women for early prevention of stunting in Padang Pariaman Regency - West Sumatra.

Methods

The method used in this research is the SEM approach because SEM is a set of statistical techniques that allows the simultaneous measurement of a series of relatively "complicated" relationships (Collier, 2020). The sample in this study was made up of 112 people who were in Padang Pariaman Regency. Before performing analytical techniques using SEM, the data was processed electrically to identify the frequency distribution of the research. The steps in processing the data first include editing or data checking. At this stage, the questionnaire is checked to ensure the completeness of the questionnaire contents. The checking is carried out after the respondent returns the questionnaire to the researcher and all questionnaires are complete. Second is the coding stage, where the researcher gives a code to the respondents' answers to facilitate data processing and analysis. Examples of positive answers are given a value of 4, and negative answers are given a value of 1. Third is where the processing stage takes place. After the data has been coded, the data is entered on the computer on an Excel worksheet. Fourth, the cleaning stage entails that all data that has been entered is checked again to see the completeness of the data so that no data is missing. Fifth, after the data is cleaned and a complete analysis is carried out, the tabulating stage takes place (organising data).

Modelling research through SEM, according to Nunkoo & Ramkissoon (2012),

allows a researcher to answer research questions that are regressive or dimensional (measuring the dimensions of a concept). Data analysis is very important in this study to strengthen the findings and the model that will be developed in the form of percentages, structural models, and statistical tables used to describe exogenous and endogenous variables to obtain an overview of research characteristics. Exogenous variables can correlate with other exogenous variables denoted with the letter X (Grace *et al.*, 2010). In the conceptual framework of this study, the exogenous variables are education (X_1), knowledge (X_2), behaviour (X_3), and the family or husband actions of pregnant women (X_4). In contrast, the endogenous variable is early prevention of stunting (Y).

Results

The results of data analysis using SEM to find a model for environmental arrangements for pregnant women in early prevention of stunting. To get the value of the variables to be studied, each observed variable is composited first based on its group in the SEM, which is called the *loading factor* value. The correlation value is the result of an analysis with a conceptual model that will be the benchmark for comparing it.

Variable Composite with CFA

For composite variables, this is meant to see the validity or invalidity of data on observed variables in latent/unobserved variables or how much variation in indicators can be explained by latent variables. In research that is still in the development stage or testing theory, the standard value to fulfil the composite value or *loading factor* is to use a tolerance value greater than 0.5. The composite values obtained are:

- Educational level: From the results of the analysis that has been carried out, the husband's educational level variable is not valid in processing because the data from this variable is group data, so only valid data appears from the values of the observed variables, such as level of knowledge,

action, and behaviour husband. Even so, the family or husband’s educational level still influences the early prevention of stunting.

- Knowledge level: In the composite variable of knowledge, information is obtained that 5 indicators are significant out of 20 indicators as indicators of knowledge because they have a *loading factor* value greater than 0.5. This shows that the husband’s knowledge level meets the tolerance value standard. With a level of knowledge that meets this, the stage of receiving new ideas requires several processes, such as the learning process and the process of selecting, adjusting, and adapting. According to Kalangie (2019), this process can take place at different degrees of speed between one social system and another.
- Family or husband actions: In the composite of action variables, information is obtained that there are 3 significant indicators out of 10 indicators as action indicators because they have a *loading factor* value greater than 0.5. This means that delays in decision-making at the family level can be avoided if mothers and their families, especially husbands of pregnant women, know the dangerous signs of pregnancy and childbirth and the actions that need to be taken to prevent early stunting.
- Family or husband behaviours: In the behavioural variable composite, information was obtained that there were 4 significant indicators out of 20 indicators as husband’s behaviour indicators because they had a *loading factor* value greater than 0.5.

Based on the confirmatory factor analysis (CFA) analysis, there was positive behaviour from husbands towards pregnant women, which can have a good health impact on pregnant women and prevent stunting in children under 5. It can be further explained that these positive behaviours include family or husband support. In addition, protective behaviours such as prescribing vitamin A, immunisation, good sanitation, and the use of iodised salt depend on the level of education of both parents.

SEM Analysis Results

To get the value of the variables obtained from the results of the SEM analysis, each observed variable is first composited based on its group in SEM, which is called the *loading factor* value. The correlation value is the result of analysis with a conceptual model that will be the benchmark for comparing it. More details can be seen in Table 1 below.

As seen in the data from Table 1 above, the *loading factor* value of each variable has a value greater than 0.5. This means that the role of the family environment is the best indicator in improving quality for early prevention of stunting in Padang Pariaman Regency. As is known, the quality of the family environment is very directly related to better cognitive development (Nurliyana *et al.*, 2020). From the values above, then an SEM model design can be made for structuring the environmental arrangements for pregnant women in the early prevention of stunting below. In the analysis results for the family or husband behaviour, the invalid observed variable data has been eliminated so that only valid data appears from the observed variable values so that a large

Table 1: Overall factor loading values

No	Variable composite	Knowledge	Action	Behaviour	Description
1		0,559	0,886	0564	
2		0,584	0,880	0,555	
3	Factor loading values	0,583	0,605	0,604	Significant
4		0,558	-	0,577	
5		0,511	-	-	

influence value is obtained. After obtaining the results of the SEM analysis, they are shown in Figures 1-2 and Table 2 below.

After the results of the analysis are carried out in Figure 1, the *T-Value* is then shown in Figure 2 below.

Based on Figure 1 and Figure 2, the results of the path coefficient and significant level of factors influencing the family or husband's behaviour are obtained. From these data, it is

found that there are factors that influence the family or husband's behaviour and factors that do not affect the family or husband's behaviour. For a clearer explanation, it can be seen in Table 2.

From the analysis of the results obtained, first, knowledge of family or husband's behaviour as shown in Table 2, the outcomes of the path analysis statistical test using the SEM model yielded a *T-Value* of 2.171 with a 95% confidence level. A value of $2.171 > 1.96$

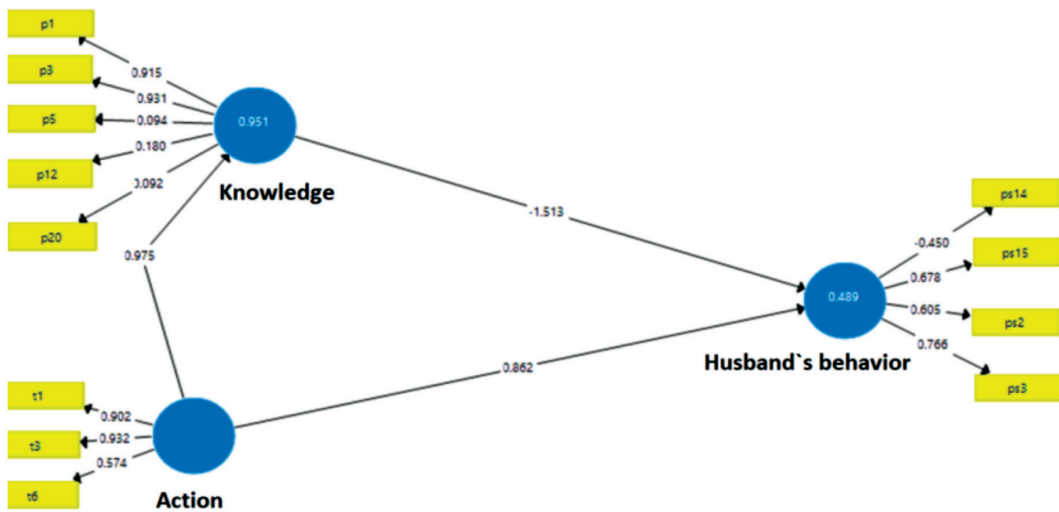


Figure 1: Path coefficient value/size of the influence of family or husband behaviour

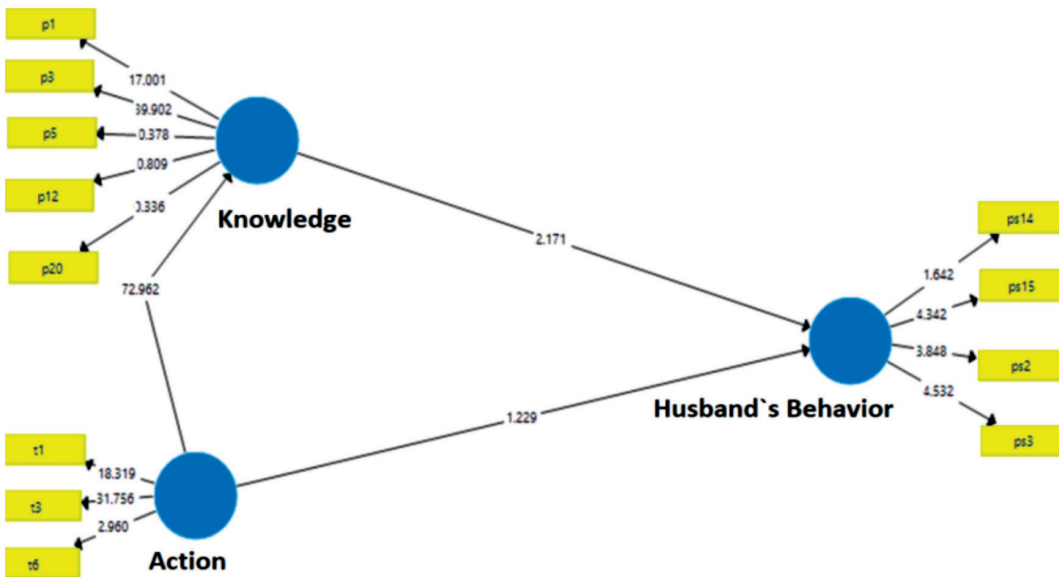


Figure 2: Significance level (*T-Value*) of family or husband behaviour

Table 2: The results of the path coefficient and the significant level of the factors that influence the occurrence of stunting

Influence between variables	Test result
Knowledge (X ₁) of husband's behaviour (Y)	Significant
Action (X ²) against husband's behaviour (Y)	Not significant

indicates that knowledge significantly influences the behaviour of the family or husband in the early prevention of stunting. Knowledge has a path coefficient of -1.513 ($\beta = 1.513$) on the husband's behaviour. In this case, the family or husband's knowledge of the danger signs of pregnancy, childbirth, and the newborn significantly influences the behaviour (Putranti *et al.*, 2020). Thus, the family or husband role can be implemented as an alternative method of conveying information to increase pregnant women's knowledge.

Secondly, actions on family or husband behaviour based on Table 2, the results of the path analysis statistical test with the SEM model obtained a *T-Value* of 1.229 with a 95% confidence level. Value $1.229 < 1.96$. This shows that actions do not significantly influence the family or husband's behaviour. Even though the family or husband's knowledge has a significant effect on the behaviour, the family or husband's actions do not affect the behaviour.

In this case, no positive action is shown by the family or husband towards pregnant women in early prevention stunting in Padang Pariaman Regency. After obtaining the overall result track according to Figure 1 and Figure 2, the results of path analysis are made, which have a significant level only for the dependent variable so that paths are formed between variables. The path formed can be seen in Figure 3 and Figure 4, as well as Table 3.

It can be seen from Table 3 that the path coefficient value of knowledge of the husband's behaviour is -0.676. This minus value indicates that the knowledge variable has a significant effect on the family or husband's behaviour, while the path coefficient value of action on the family or husband's knowledge is 0.974. It can be concluded that the action variable of the family or husband indirectly influences the behaviour through knowledge. Based on Table 3 above, a path analysis is formed, which is obtained using the SEM model. Therefore,

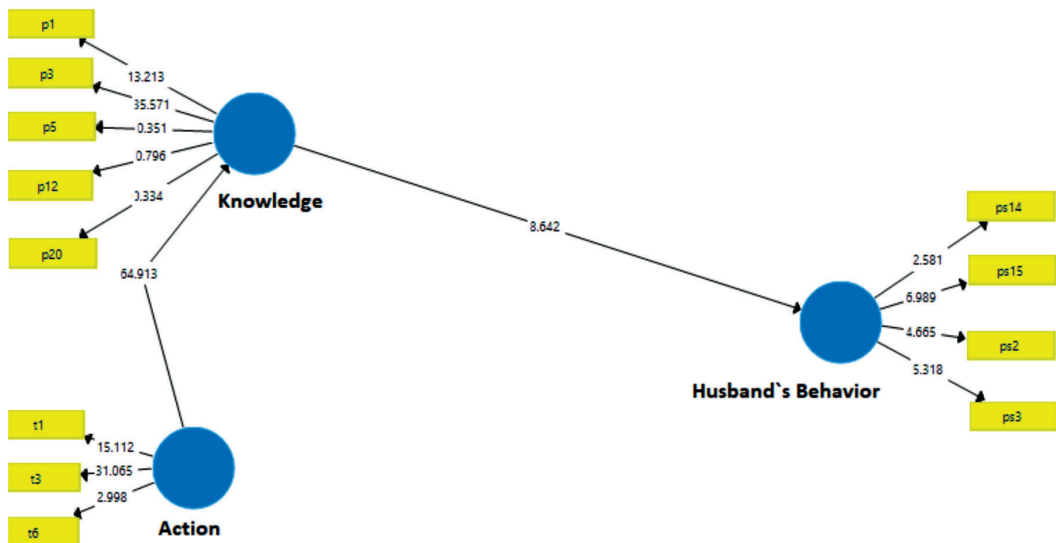


Figure 3: The path coefficient/influence of family or husband behaviour

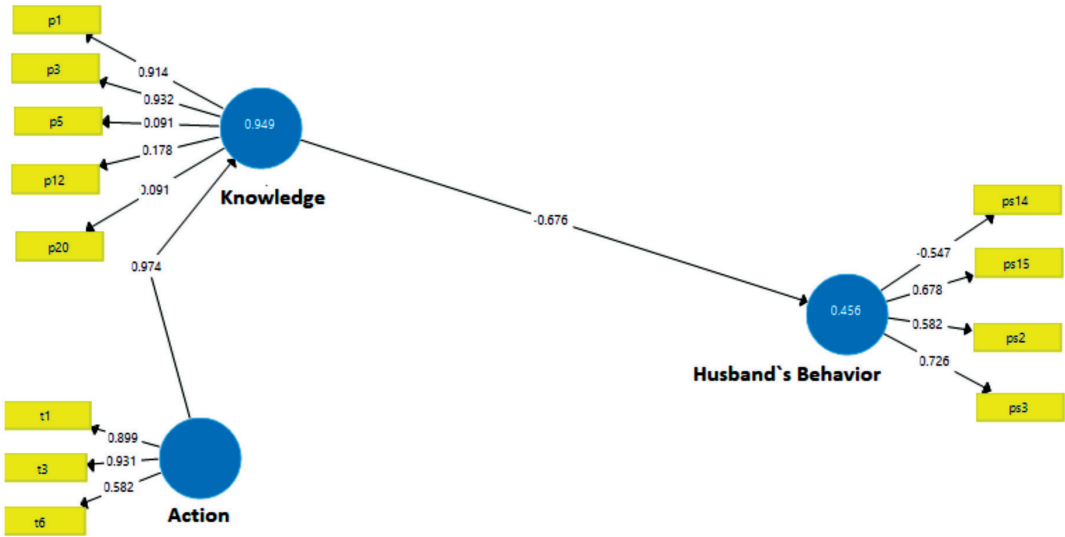


Figure 4: Significance level (*T-Value*) of family or husband behaviour

Table 3: The results of the significance level and the influence/path coefficient using the SEM model on the factors that influence the incidence of stunting

Variable	Path coefficient	<i>T-Value</i>	Information
Knowledge (X_1) -- Husband's behaviour (Y)	-0,676	8,642	Significant
Action (X^2) -- Husband knowledge (X_1)	0,974	64,913	Significant

an interpretation is carried out to interpret the results of the path analysis so that it can provide information from the path analysis. The overall results show that the ability of the family or husband behaviour variable to explain the variance of each variable is 45.6%, which means that the level of education, knowledge, action, and behaviour of the family or husband of pregnant women has a variance of 45.6% for each variable and a value of 54.4% which means other factors influence it. After researching and based on theory, other factors that influence early prevention of stunting in Padang Pariaman Regency are attitude, motivation, family support, and the role of health workers.

Model for Environmental Arrangements

Structuring the environmental arrangements for pregnant women's families or husbands in the early prevention of stunting is one of the strategies used to improve the quality and

quality of human resources. This is vital to be able to identify the problems experienced and seek to find alternative solutions to the problems faced. The environmental arrangement is a process of guiding or providing opportunities to society (in this case, the family or husband of pregnant women) carried out by researchers through a series of activities. It enables the family or husband to have the ability and confidence to deal with surrounding problems with his pregnant woman.

The model for managing the environmental arrangements for pregnant women in the early prevention of stunting in this research was developed from a framework for the causes of stunting problems in Indonesia released by the Agency of National Development Planning/ BAPPENAS (2018), which can be seen in Figure 5. Psychosocial theory (Singh-Manoux *et al.*, 2002) suggests that differences in socioeconomic status affect health through perceptions of one's

position in the social hierarchy. The lower a person’s social hierarchy, the more powerless and the more often they experience health problems. Therefore, educational activities are urgently needed in early stunting prevention.

The main objective of this research is to change the behaviour of pregnant women’s families (especially husbands), to empower them so they can recognise the signs and

dangers of pregnancy and can make decisions about the problems of pregnancy and childbirth that will be faced. One form of effort in health promotion by bringing unique local values is an indirect approach using mass media such as books/modules and applications as tools to make it easier for society to get information about health.

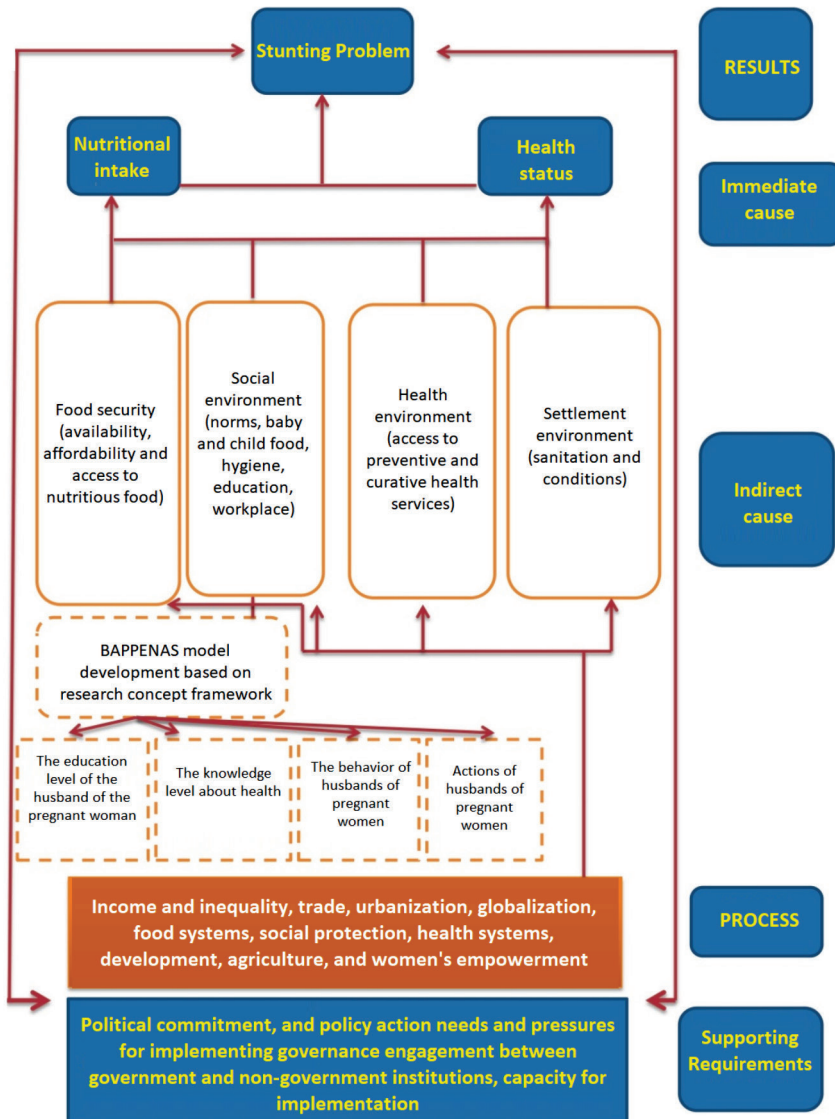


Figure 5: The model for managing the environmental arrangements for pregnant women in the early prevention of stunting developed from the framework of the causes of stunting, according to BAPPENAS (2018)

Discussions

This research was conducted on 112 families or husbands of pregnant women spread across the Padang Pariaman Regency. The exogenous variables in this research were education, knowledge, actions, and behaviour, while the endogenous variable was early stunting prevention. According to the Indonesian Ministry of Health, in 2018, the stunting rate in Padang Pariaman Regency reached 39.2%. This number is still within the limit set by the World Health Organization (WHO), which is 20% (Rahmawati *et al.*, 2018). This research is in line with research by (Kwok *et al.*, 2020) on “The Relationship Between Parent-Child Triangulation and Early Adolescent Depression in Hong Kong: The Mediating Roles Of Self-Acceptance, Positive Relations, And Personal Growth”, which shows a $p\text{-value} < 0.05$ means that there is a significant relationship between parents’ attention to stunting.

Research similar to this includes research conducted by Niveditha *et al.* (2020), which states that there is no relationship between sociodemographic factors (such as income and education level) related to stunting. Factors that are directly related to stunting are ANC counselling through the media and handling and preventing toddlers from consuming nutritious food in pregnant women. Abdulrahman *et al.* (2020) stated that counselling had a significant effect on knowledge ($p\text{-value} < 0.0001$), attitudes ($p\text{-value} < 0.007$), and behaviour (0.02). Therefore, early stunting prevention counselling is needed for pregnant women.

Research conducted by Islami *et al.* (2020) also stated that mothers had a significant relationship with the incidence of stunting. However, this study stated that mothers’ knowledge did not have a significant relationship with stunting. Research on the environmental arrangements for pregnant women’s families in the early prevention of stunting also looks at the relationship between education, knowledge, actions, and behaviour in early stunting prevention, which is analysed using the SEM

method. Based on the research that has been done, it is found that:

- A low level of family or husband education can be a risk factor for stunting in children under five, where educated parents have broader knowledge about child care and care. The level of education is also related to income, where the level of income tends to be higher along with the higher level of education. Educated families live in small households with decent housing conditions, maintain a clean environment, and make better use of healthcare facilities. Mothers with higher education levels tend to have a positive attitude towards food nutrition so that it can help meet adequate nutritional needs for the family. A high level of education also affects the ability to receive information about nutrition and child health. The existence of a significant relationship between a mother’s education and the incidence of stunting in toddlers was also shown in a study by Semba *et al.* (2008).
- The factor that plays a major role in the early prevention of stunting is the knowledge possessed by the families of pregnant women. Based on research conducted by Gurmu *et al.* (2020), it is stated that the level of knowledge possessed by parents regarding nutritional intake in children has an important role. Parents must know what food is given to babies, starting with exclusive breastfeeding, breast milk substitutes, and nutritious food intake that can help the baby’s physical and brain development. The main factor causing the high prevalence of stunting in Indonesia is poor nutritional intake since the fetus is still in the womb (pregnancy), newborn, until the child is 2 years old. Therefore, increasing knowledge about nutrition needs to be done in the form of continuous education for the community, especially parents. Parents must understand the nutritional needs of children, as well as good and bad foods,

and not be easily influenced by the use of instant food.

- The positive actions taken by the families or husbands of pregnant women have a very good impact on their health and prevent stunting in children. According to the research by Mora & Nestel (2000), pregnant women must take good actions to improve the health status of their children. This will also have an impact on the mental condition of pregnant women. According to the theory of planned behaviour, a person can act based on his intention only if he has control over his behaviour. Intentions can also be influenced by self-identity and past behaviour. In addition, Savari & Gharechae (2020) also explained that attitudes toward action and perceived behavioural control are significant variables for explaining intentions. The intention will be the basis for changing a person's behaviour and will have an impact on preventing disease.
- Past behaviour has a major influence on stunting prevention behaviour in children aged 24-59 months. So, it is important to carry out education related to stunting prevention by reviewing the behaviour before it was carried out by the respondent and by carrying out early handling by monitoring the growth and development of children to prevent stunting.

The development of this model is based on the results of quantitative analysis using the SEM method. The conclusion drawn is that the involvement of families, particularly husbands, in supporting pregnant women is significantly inadequate, with a notable absence of active participation throughout the pregnancy. Pregnant women often do not receive essential information from healthcare providers, and there is a marked deficiency in husbands' knowledge about stunting. Furthermore, there is insufficient support from husbands in the early prevention of stunting. In the model SEM, 54.4% indicates that the factors that must be prevented and addressed to overcome the problem of stunting in toddlers in Padang Pariaman Regency are minimising

LBW, having no more than 3 children, needing good parenting boys, preventing mothers from giving birth at the age of fewer than 20 years, increasing support for pregnant women and improving the nutritional status of pregnant women, increasing the education of parents, especially husbands, focusing on health services for toddlers in rural areas.

LBW is also a major risk factor for stunting. The lower the baby's weight at birth, the higher the risk of stunting (Ahmad, 2022). This is in line with research by Novianti & Nurjaman (2022) regarding environmental factors that cause stunting where a significant relationship was obtained ($p\text{-value} < 0.05$) between the father's education, mother's education, family income, food availability in the family, and environmental sanitation with the incidence of stunting in toddlers. Studies by Aryastami *et al.* (2017) have also proven that birth weight is related to the incidence of stunting in toddlers. LBW toddlers are at risk of 1.31 times experiencing stunting compared to toddlers with normal birth weight.

Conclusions

The following conclusions are obtained from research on the environmental arrangements for pregnant women in the early prevention of stunting. Firstly, based on the composite variables using CFA analysis, the factor loading value of each variable is greater than 0.5. It means that the education level of the family or husband, knowledge of the family or husband, actions of the family or husband and behaviour have a direct effect. Secondly, the study revealed factors impacting the environmental conditions conducive to early prevention of stunting in pregnant women. It was discovered that the knowledge of families or husbands directly affects. In contrast, the actions of families or husbands indirectly influence the behaviour of pregnant women towards the early prevention of stunting. Thirdly, the overall results show that the ability of the family or husband behaviour variable to explain the variance of each variable is 45.6%. It means that the level of education,

knowledge, action, and behaviour of the family or husband of pregnant women has a variance of 45.6% for each variable, and there is a value of 54.4%, which means there are other factors that influence it.

Conflict of Interest Statement

The authors declare that they have no conflict of interest.

Acknowledgements

This research is an annual mandatory research for Lecturers in the Universitas Negeri Padang. The author would like to thank the Health Office of Padang Pariaman Regency for data support, guidance, and technical assistance for this research.

References

- Abdulrahman, M., Husain, Z. S., Abdouli, K. A., Kazim, M. N., Ahmad, F. S. M., & Carrick, F. R. (2020). Association between knowledge, awareness, and practice of patients with type 2 diabetes with socio-economic status, adherence to medication and disease complications. *Diabetes Research and Clinical Practice*, *163*, 108124.
- Ali, A. (2021). Current status of malnutrition and stunting in Pakistani children: What needs to be done? *Journal of the American College of Nutrition*, *40*(2), 180-192.
- Almatsier, S. (2010). *Prinsip dasar ilmu gizi*. Jakarta: PT Gramedia Pustaka Utama.
- Aryastami, N. K., Shankar, A., Kusumawardani, N., Besral, B., Jahari, A. B., & Achadi, E. (2017). Low birth weight was the most dominant predictor associated with stunting among children aged 12-23 months in Indonesia. *BMC Nutrition*, *3*(1), 1-6.
- Barahima, J. J., Noor, N. N., & Jafar, N. (2019). Relationship of economic and social culture status in the first 1000 days of life (HPK) period toward events of stunting in children ages of 0-24 months in barebbo district working area, bone regency. *EAS J Hum Cult Stud*, *4*, 206-11.
- Booth, A., Purnagunawan, R. M., & Satriawan, E. (2019). Towards a healthy Indonesia? *Bulletin of Indonesian Economic Studies*, *55*(2), 133-155.
- Browne, J. L., Kayode, G. A., Arhinful, D., Fidler, S. A., Grobbee, D. E., & Klipstein-Grobusch, K. (2016). Health insurance determines antenatal, delivery and postnatal care utilisation: Evidence from the Ghana Demographic and Health Surveillance data. *BMJ Open*, *6*(3), e008175.
- Collier, J. E. (2020). *Applied Structural Equation Modeling using AMOS: Basic to advanced techniques*. Routledge.
- Dewata, I., Widodo, T., & Putra, A. (2023). Relationship of giving pill/syrup Fe (Iron) complex, parity, ANC examination, and the age of women giving birth to BBLR. *Journal of Chemical Health Risks*, *13*(1), 175-185.
- Grace, J. B., Anderson, T. M., Olf, H., & Scheiner, S. M. (2010). On the specification of structural equation models for ecological systems. *Ecological Monographs*, *80*(1), 67-87.
- Gurmu, F., Shimelis, H., Laing, M., & Mashilo, J. (2020). Genotype-by-environment interaction analysis of nutritional composition in newly-developed sweet potato clones. *Journal of Food Composition and Analysis*, *88*, 103426.
- Hackshaw, A., Rodeck, C., & Boniface, S. (2011). Maternal smoking in pregnancy and birth defects: A systematic review based on 173 687 malformed cases and 11.7 million controls. *Human Reproduction Update*, *17*(5), 589-604.
- Islam, M. S., Zafar Ullah, A. N., Mainali, S., Imam, M. A., & Hasan, M. I. (2020). Determinants of stunting during the first 1,000 days of life in Bangladesh: A review. *Food Science & Nutrition*, *8*(9), 4685-4695.

- Kalangie, N. (2019). Kerangka konseptual sistem perawatan kesehatan. *Antropologi Indonesia*, 24-33.
- Karatay, G., Kublay, G., & Emiroğlu, O. N. (2010). Effect of motivational interviewing on smoking cessation in pregnant women. *Journal of Advanced Nursing*, 66(6), 1328-1337.
- Kwok, S. Y., Gu, M., Sychaisuksawat, P., & Wong, W. W. (2020). The relationship between parent-child triangulation and early adolescent depression in Hong Kong: The mediating roles of self-acceptance, positive relations and personal growth. *Children and Youth Services Review*, 109, 104676.
- Masrul, M., Izwardy, D., Sudji, I. R., Purnakarya, I., Syahrial, S., & Nindrea, R. D. (2020). Microbiota profile with stunting children in West Sumatera Province, Indonesia. *Open Access Macedonian Journal of Medical Sciences*, 8(E), 334-340.
- Mora, J. O., & Nestel, P. S. (2000). Improving prenatal nutrition in developing countries: Strategies, prospects, and challenges. *The American Journal of Clinical Nutrition*, 71(5), 1353S-1363S.
- Niveditha, C. V., Fatima, M. J., & Sindhu, S. (2016). Comprehensive interfacial study of potentiodynamically synthesised copper oxide thin films for photoelectrochemical applications. *Journal of The Electrochemical Society*, 163(6), H426.
- Nunkoo, R., & Ramkissoon, H. (2012). Structural equation modelling and regression analysis in tourism research. *Current Issues in Tourism*, 15(8), 777-802.
- Nurliyana, A. R., Shariff, Z. M., Taib, M. N. M., Gan, W. Y., & Tan, K. A. (2020). Early growth and home environment are associated with cognitive development in the first year of life of Malaysian infants. *Early Human Development*, 140, 104890.
- Putranti, H. R. D., Suparmi, S., & Susilo, A. (2020). Work life balance (WLB) complexity and performance of employees during Covid-19 pandemic. *Arthatama*, 4(1), 56-68.
- Rahmawati, V. E., Pamungkasari, E. P., & Murti, B. (2018). Determinants of stunting and child development in Jombang District. *Journal of Maternal and Child Health*, 3(1), 68-80.
- Raiten, D. J., & Bremer, A. A. (2020). Exploring the nutritional ecology of stunting: New approaches to an old problem. *Nutrients*, 12(2), 371.
- Savari, M., & Gharechae, H. (2020). Application of the extended theory of planned behaviour to predict Iranian farmers' intention for safe use of chemical fertilisers. *Journal of Cleaner Production*, 263, 121512.
- Scheffler, C., & Hermanussen, M. (2022). Stunting is the natural condition of human height. *American Journal of Human Biology*, 34(5), e23693.
- Semba, R. D., de Pee, S., Sun, K., Sari, M., Akhter, N., & Bloem, M. W. (2008). Effect of parental formal education on risk of child stunting in Indonesia and Bangladesh: A cross-sectional study. *The Lancet*, 371(9609), 322-328.
- Setia, A., Shagti, I., Boroa, R. M., Adi, A. M., Saleh, A., & Amryta, P. (2020). The effect of family-based nutrition education on the intention of changes in knowledge, attitude, behaviour of pregnant women and mothers with toddlers in preventing stunting in Puskesmas Batakte, Kupang Regency, East Nusa Tenggara, Indonesia working area. *Pakistan Journal of Medical and Health Sciences*, 16, 48-55.
- Singh-Manoux, A., Clarke, P., & Marmot, M. (2002). Multiple measures of socio-economic position and psychosocial health: Proximal and distal measures. *International Journal of Epidemiology*, 31(6), 1192-1199.
- Win, H., Shafique, S., Mizan, S., Wallenborn, J., Probst-Hensch, N., & Fink, G. (2022). Association between mother's work status and child stunting in urban slums: A cross-

- sectional assessment of 346 child-mother dyads in Dhaka, Bangladesh (2020). *Archives of Public Health*, 80(1), 1-16.
- Yadika, A. D. N., Berawi, K. N., & Nasution, S. H. (2019). Pengaruh stunting terhadap perkembangan kognitif dan prestasi belajar. *Jurnal Majority*, 8(2), 273-282.
- Yanti, E., & Aprihatin, Y. (2021). Development model of improving the role of pregnant women husbands for preventing early stunting in Regency Padang Pariaman in 2021. *International Journal on Integrated Education*, 4(10), 224-226.