

Stunting Incidents Based on Socio-Demographic Determinants, Family Food Security, And Maternal Digital Parenting

Abstract

Toddlers are one of the groups that are vulnerable to malnutrition and are often associated with a lack of protein energy over a long period of time. Stunting is a chronic malnutrition problem that causes a child to fail to grow compared to other children in the same age range. The stunting locus villages from 2019 to 2022 in Maros Regency were 80 villages, 23 sub-districts spread across 14 sub-districts, this includes the Marusu Health Center work area. Mothers' knowledge, and behavior, poor feeding attitudes, economic problems are some of the factors that contribute to stunting.

Objective. Research purposes This is For analyze connection knowledge, attitude, action, support family, role cadre integrated health post, resilience food, digital parenting, culture Mother toddlers at Marusu Health Center.

Method. Methodology research used in study This is study quantitative with use design cross-sectional research . Number sample in study This is 341 mothers toddler . Taking sample in study This using total sampling.

Findings : The research outcomes reveal that none of the investigated factors exhibit a statistically significant correlation with stunting in the Marusu Health Center area. The Chi-Square test yielded p-values for knowledge ($p = 0.805$), maternal attitudes ($p = 0.942$), maternal practices ($p = 0.726$), family support ($p = 0.942$), the role of health service post cadres ($p = 1.000$), food security ($p = 0.632$), digital parenting ($p = 0.378$), and cultural factors ($p = 0.812$), all of which surpass the 0.05 significance threshold, indicating no significant relationships.

Conclusion : The study concludes that there is no statistically significant association between knowledge, attitudes, behaviors, family support, the role of integrated health post cadres, food security, digital parenting, cultural factors, and the incidence of stunting in the Marusu Health Center area.

Keywords: Mother of Toddler, Attitude, Action, Family Support, Role of Posyandu Cadres, Food Security, Digital Parenting, Culture

Introduction

Mothers hold a crucial role in their children's development. Although Indonesian society often attributes stunted growth to hereditary factors, stunting is fundamentally a health issue driven by multiple contributing factors. It represents a chronic nutritional deficiency in toddlers, manifesting as a height significantly shorter than expected for their age.^[1]

According to the World Health Organization (WHO), 20 percent of pregnancies experience inadequate nutritional intake, which continues to affect the baby after birth. This deficiency can lead to growth disorders in children, such as stunting. Characterized by a child's height being shorter than the age-appropriate standard, stunting is a result of chronic malnutrition due to prolonged insufficient nutrient intake. The first two years of life, commonly known as the first 1,000 days, mark a pivotal stage for a child's development and growth, underlining the family's significance as the primary setting for nurturing and caregiving. Recognizing this, the government has prioritized a family-centered approach to stunting prevention. Stunting poses a significant threat to human quality and national competitiveness in the future, as it not only impairs physical growth but also brain development, potentially hindering educational achievements, productivity, and creativity. At this time, babies must get sufficient and appropriate nutritional intake so that they do not suffer from malnutrition which can lead to stunting.^[2] Infants and toddlers face serious short-term consequences from stunting, including increased morbidity and mortality risks. Over time, stunting also affects intellectual and cognitive abilities in the medium term. In the long term, stunting negatively impacts the overall quality of human resources, influencing productivity and national development.^[3]

The malnutrition crisis in Asia is severe, particularly affecting children under five, with a stunting prevalence of 21.8%, higher than the global average of 21.3%. Southeast Asia experiences a

stunting rate of 24.7%, ranking second in Asia after South Asia. In 2019, approximately 144 million children globally under the age of five were affected by stunting, with two-thirds residing in Africa and Southeast Asia, highlighting the regional concentration of this global issue.⁴¹

In 2018, South Sulawesi had a stunting prevalence of 35.7%, with several districts showing particularly high rates, such as Pangkep (50.5%) and Tana Toraja (47%). The national stunting rate that year was 30.8%, a significant decrease from previous years, as shown by Basic Health Research data, where stunting prevalence in 2007, 2010, and 2013 ranged between 34.6% and 37.2%. To further combat stunting in Indonesia, the government sought to decrease the rate to 28%, a key objective outlined in the 2019 National Medium-Term Development Plan (RPJMN).⁵¹

The objective of this study is to examine the connection between cognitive and emotional factors, along with available resources, and the health-promoting behaviors of pregnant women in the Bajeng Health Center service area.

To address stunting, it is essential to educate the community on the importance of nutrition for pregnant women and toddlers. Research shows that health education interventions, designed with specific methods to prevent health problems, have significantly improved knowledge, attitudes, and behaviors, highlighting the effectiveness of well-structured educational efforts.⁶¹ Despite these educational efforts, the changes in behavior and knowledge often prove short-lived, as evidenced by the persistence of issues like stunting. An integrated strategy is required for effective stunting prevention, which includes improving knowledge, attitudes, and behaviors, as well as fortifying family support, the involvement of Posyandu cadres, food security, digital parenting, and cultural factors.

The aim of the research was to analyze connection knowledge, attitude, action, family support, role cadre integrated health post, resilience food, digital parenting, culture Mother toddlers at Marusu Health Center.

Method

This study Conducted from August to September 2024 in the Marusu Health Center area, focuses on regions with high stunting prevalence. A quantitative approach with a cross-sectional design was employed. Primary data were collected through questionnaires given to respondents, while secondary data were sourced from the Marusu Health Center's reports. The study population comprised 341 pregnant women in the Marusu Health Center area in 2024, and total sampling was used to determine the sample size.

Data collection involved a combination of interviews, observations, and questionnaires. Interviews were conducted with mothers of toddlers to gather essential information related to the research topic and the specific issues being investigated. Direct observations were conducted to study the behaviors and conditions of mothers with toddlers in the research setting. Additionally, a questionnaire was administered to these mothers to assess and analyze their knowledge, attitudes, actions, family support, the role of Posyandu cadres, food security, digital parenting, and cultural influences. The questionnaire included pre-formulated questions with multiple-choice answers provided for the respondents. The instrument used was a questionnaire consisting of 132 items based on a 4-point Likert scale and a 2-point Guttman scale. Construct validity was measured using CFA (Confirmatory Factor Analysis), with an average validity result of 0.85 and a Cronbach's Alpha reliability of 0.90.

The analytical process involves three approaches: univariate analysis to summarize each variable, bivariate analysis employing the Chi-Square test to examine associations between independent and dependent variables, and multivariate analysis to pinpoint the independent variables with the greatest influence on the dependent variable.

Interviews were conducted with mothers who have toddlers (children under five years old) and experience stunting in this case to obtain information about data and other necessary information related to the problem being studied as well as being the object of research. Observations were conducted to thoroughly observe the object to be studied, namely direct observation of stunted children and studying things related to research directly at the research location, namely those related to knowledge, attitude, action, support family, role cadre integrated health post, resilience food, digital parenting, culture Mother toddlers. Questionnaire sheets were given to mothers of toddlers to find out and analyze stunting and how to overcome it, and the factors that cause it. Data collection using a questionnaire contains how to ask questions that have been prepared in writing by distributing questionnaires and accompanied by alternative answers that will be given to

respondents. The analysis process involves three techniques, namely univariate analysis to describe the characteristics of independent variables and dependent variables, bivariate analysis to determine the relationship between independent variables and dependent variables, and multivariate analysis to determine the independent variables that have the most influence on the dependent variable. This study conducted a multivariate test by utilizing several logistic regression tests because the dependent variable is categorical, which aims to combine various independent variables that are considered most effective in predicting dependent events.

The research has obtained research ethics from The Ethics Committee for Health Research at the Faculty of Health Sciences "Maluku Husada" has issued an ethics permit to protect the human rights of individuals participating in health research, having reviewed the relevant research protocols. This approval can be identified by the registration number RK. 177 / KEPK / STIK / VIII / 2024.

Findings

After analyzing the processed data, the findings from the research that has been conducted are as follows :

Respondent Characteristics

Respondent characteristics include traits inherent in the respondents. The following is the distribution of respondent characteristics:

Table 1
Pregnant Women Based on Number of Children, Number of Household Members, Education, Type of Work, Tribe in the Marusu Health Center Working Area, Maros Regency in 2024

Variables	N	%
Number of children		
<3 Years	297	87
>3 Years	44	13
Total	341	100.0
Number of Household Members		
<5	295	86.5
>5	46	13.0
Total	341	100.0
Education		
SD	58	17.0
Junior High School	80	23.5
Senior High School	178	52.2
Diploma	16	4.7
Bachelor	9	2.6
Total	341	100.0
Type of work		
housewife	314	92.1
Self-employed	17	5
Laborer/Farm Laborer	1	0.3
Honorary	9	2.6
Total	341	100.0
Ethnic group		
Bugis	210	61.6
Buton	1	0.3
Java	4	1.2
Makassar	121	35.5
Toraja	5	1.5
Total	341	100.0

Table 2

Distribution of Respondents Based on Maternal and Child Health in the Marusu Health Center Working Area, Maros Regency in 2024

Mother's Age at Delivery (yrs)		
Category	n	%
At risk	49	14.4
No Risk	292	85.6
Pregnancy Interval (Th)		
≤ 1	125	36.6
2-3	106	31.1
>3	110	32.3
Toddler Gender		
Woman	175	51.3
Man	166	48.7
Toddler Nutritional Status (TB/A)		
Very Short	48	14.1
Short	46	13.5
Normal	216	63.3
Tall	31	9.1
Stunting in Toddlers		
Stunting	93	27.3
No Stunting	240	72.7
Total	341	100.0

Table 3
Distribution of Respondents Based on Knowledge, affective, actions, family support, Role of Posyandu Cadres, Food Security, Digital Parenting, and Culture with Stunting Incidents at Marusu Health Center in 2024

Knowledge	Stunting Incident				Total	P Value	
	Stunting		No Stunting				
	n	%	n	%			
Not enough	5	1.5	17	5	22	6.5	0.805
Enough	88	25.8	231	67.7	319	93.5	
Total	93	27.3	248	72.7	341	100	
Negative	0	0	2	0.8	2	0.6	0.942
Positive	93	27.3	246	72.1	339	99.4	
Total	93	27.3	248	72.7	341	100	
Not good	1	0.3	6	1.8	7	2.1	0.726
Good	92	27	242	71	334	97.9	
Total	93	27.3	248	72.7	341	100	
Not enough	0	0	2	0.6	2	0.6	0.942
Enough	93	27.3	246	72.1	339	99.4	
Total	93	27.3	248	72.7	341	100	
Not good	0	0	1	0.3	1	0.3	1
Good	93	27.3	247	72.4	340	99.7	
Total	93	27.3	248	72.7	341	100	
Not enough	76	22.3	195	57.2	271	79.5	0.632
Enough	17	27.3	53	15.5	70	99.7	
Total	93	27.3	248	72.7	341	100	
Not enough	24	7	78	22.9	102	29.9	0.378
Enough	69	20.2	170	49.9	239	70.1	
Total	93	27.3	248	72.7	341	100	
Not good	55	16.1	152	44.6	207	60.7	0.812
Good	38	11.1	96	28.2	134	39.3	
Total	93	27.3	248	72.7	341	100	

Discussion

The findings indicate that a significant proportion of respondents had three or fewer children (87%) and five or fewer household members (86.5%). This suggests that the families in this study are predominantly small to medium-sized, which may affect their capacity to provide sufficient attention and resources for the health and well-being of each child. Smaller families can often focus more on care and nutrition, so that the risk of health problems in children, including stunting, can be better controlled. The increasing number of family members without being balanced by increasing income will cause the distribution of food consumption to be increasingly uneven. The food available for a large family may only be enough for a family that is half the size of the family. Such conditions are not enough to prevent the occurrence of nutritional disorders in large families.^[7]

The data reveal that a significant majority of respondents possess a high school education (52.2%), while only a minimal proportion hold a bachelor's degree (2.6%). This indicates that maternal education plays a crucial role in shaping knowledge regarding nutrition and child health. Mothers with higher educational attainment are likely to have improved access to health information and greater awareness of the significance of proper nutrition and effective parenting practices.^[8] Considering that most respondents have completed high school or less, it is essential to prioritize educational programs that emphasize nutrition and child health in the Marusu Health Center service area.

The working mother factor does not play a role as the main cause of child nutritional problems, but work is mentioned as a factor that influences the provision of food, nutrients, and child care.^[9] In terms of work, 92.1% of respondents are housewives. This shows that these mothers are more focused on helping with household chores, and focusing on caring for children rather than working outside the home. Although the role of a housewife allows more time to care for children, the availability of accurate information and support from maternal and child health programs is very crucial in efforts to improve children's nutritional status, especially related to preventing stunting.

Based on maternal health data, the majority of mothers (85.6%) are not included in the risk category according to age at delivery. However, there are 14.4% of mothers who are included in the risk category, which requires special attention because giving birth at too young or too old an age is associated with an increased risk of health complications for the mother and baby, including causing stunting in children due to psychological influences.^[10] Young mothers often lack preparedness for pregnancy and may be unfamiliar with proper prenatal care, while older mothers typically experience reduced stamina and diminished motivation in managing their pregnancies.

Given that pregnancy spacing is a crucial determinant of children's health, it can be concluded that inadequate pregnancy spacing contributes to the occurrence of stunting. Birth spacing can cause stunting because pregnancy spacing affects the parenting patterns of parents towards their children. In this study, 36.6% of mothers had a pregnancy spacing of ≤ 1 year. Pregnancy spacing that is too close is known to be a risk of stunting in subsequent children because the mother may not have fully recovered from the previous pregnancy, both in terms of physical health and nutritional status. The risk of stunting is significantly elevated for children with a birth interval of less than 2 years, being 11.65 times higher than that of children with a birth spacing of 2 years or longer.^[11]

The nutritional status of toddlers, as assessed by height for age (H/A), reveals that 14.1% of the children fall into the category of very short, while 13.5% are classified as short. This indicates that almost 30% of children experience growth problems that can be categorized as stunting. Socio-demographic factors, such as maternal education, economic conditions, and employment, can affect this nutritional status, especially in families with limited resources. Intervention efforts targeting high-risk families are essential to improve stunting conditions. The presence of 27.3% of toddlers experiencing stunting confirms that stunting is still a significant health problem in the study area. Given that the majority of mothers are housewives with secondary education, intervention programs that focus on nutrition education, increasing access to nutritious food resources, and regular monitoring of maternal and child health are needed. Health programs such as Posyandu and nutrition counseling can be maximized to provide relevant information to these mothers.

The results of the study emphasize the importance of attention to socio-demographic factors and maternal and child health in efforts to prevent stunting. Limited maternal education and work as a housewife can limit their access to important health information, especially regarding balanced diet and nutrition for toddlers. Therefore, affordable and easily accessible nutrition and health counseling for the community, especially those based in villages, is needed to reduce stunting rates.

Increasing education about family planning and ideal birth spacing will also help reduce health risks to mothers and children, which can ultimately reduce the prevalence of stunting in the area.

Theoretically, maternal age at birth is a significant risk factor for stunting. Mothers who give birth at too young an age (<20 years) or too old (>35 years) are at higher risk of experiencing pregnancy and birth complications, which can directly affect the health of the baby.^[10] Maternal age significantly influences pregnancy health, as younger mothers may lack the physiological maturity required for a healthy pregnancy, whereas older mothers are often at a heightened risk for chronic health conditions such as hypertension and gestational diabetes, both of which can adversely impact fetal growth. Previous studies have shown that mothers who give birth at a young age often face difficulties in providing proper nutrition to their children, both due to limited knowledge and physical and emotional capacity.^[8]

This research demonstrates that maternal age during childbirth is not significantly related to the incidence of stunting in children from a statistical standpoint. One possible explanation is the presence of other more dominant variables, such as access to good health care during pregnancy, family support, or socio-economic status. These factors may have a greater impact on preventing or worsening stunting, although maternal age is theoretically at risk. In addition, the development of better health services to support mothers at various ages can reduce the risk of stunting, thus blurring the influence of age as a single factor. Further research that takes into account the interaction between age and socio-economic conditions may be needed to explain this relationship more comprehensively.

The attitudes of mothers toward their children's health and nutrition indicate their perceptions regarding the importance of nutrition in fostering children's growth and development. According to cognitive behavioral theory, positive attitudes are usually translated into actions that support children's health, such as choosing nutritious foods and regular health checks. Research shows that a good attitude toward healthy eating patterns can contribute to stunting prevention.

The results of this study indicate that there is no substantial correlation between maternal attitudes and the occurrence of stunting. One possible explanation is that even though mothers have positive attitudes, implementation in the form of real actions may be influenced by external constraints such as economic access, lack of social support, or dietary patterns that are already rooted in family culture^[12]. In addition, positive attitudes also require knowledge and skills to implement appropriate actions, which are not always available in all socio-economic contexts.^[9] Therefore, efforts to prevent stunting need to include aspects of education and attitude change, as well as practical support to overcome obstacles in implementing actions.

Maternal actions, such as providing nutritious food and proper health care, play an important role in preventing stunting. According to health behavior theory, good actions in child care, including exclusive breastfeeding and timely provision of complementary foods, can reduce the risk of malnutrition and stunting.^[13] Despite this, the study's findings demonstrate that maternal actions do not have a statistically significant relationship with the prevalence of stunting. This suggests that although maternal actions are important, there are other factors that influence these outcomes, such as social support, access to health facilities, and adequate knowledge about nutrition.^[14] Although mothers may carry out good actions, success in preventing stunting is also influenced by limited access and a supportive environment. The provision of health services and the dietary habits within households may also play a role in influencing the association between maternal actions and the incidence of stunting.

Family support is often considered an important factor in ensuring that mothers have a supportive environment in which to care for their children. Support from other family members, such as partners or grandparents, can help mothers care for their children and provide an environment conducive to their children's growth and development.^[15] Effective support can help mothers overcome the challenges of providing adequate nutrition for their children. However, this study found that family support was not significantly associated with stunting. This may indicate that the type of support mothers receive is not directly related to aspects of children's nutrition and health. For example, emotional support alone may not be enough to prevent stunting if it is not accompanied by practical support, such as assistance in preparing nutritious food or access to health services. This suggests that intervention programs need to focus on improving the quality of family support, especially in terms of childcare and meeting nutritional needs.

The involvement of Posyandu cadres is crucial in delivering nutrition education and essential health services to mothers and children; through direct community engagement and consistent monitoring

of child development, they effectively disseminate information regarding optimal nutrition practices, as outlined in the theory of innovation diffusion.^[16] This study's findings show that there is no significant association between the engagement of Posyandu cadres and the occurrence of stunting, likely because of their constrained capacity and resources to implement their duties effectively. Additionally, the infrequency of cadre visits may be insufficient to substantially influence stunting prevention. Therefore, enhancing training and support for Posyandu cadres is essential to empower them to assume a more proactive and effective role in stunting prevention within the community.^[17] The findings indicated that the correlation between food security and the incidence of stunting was not statistically significant ($p=0.632$). While mothers experiencing food insecurity had a higher percentage of stunted children (22.3%) compared to those with adequate food security (27.3%), this disparity did not meet the threshold of statistical significance necessary to infer a strong effect. Family food security is closely linked to food availability, which serves as one of the factors or indirect causes affecting children's nutritional status.^[18] Sufficient access to nutritious food is crucial for preventing malnutrition and stunting. Nonetheless, the findings of this study suggest that food security alone is insufficient to guarantee that children receive the necessary nutrition for optimal growth. Other factors, such as daily dietary patterns, food diversity, and healthy eating habits, may have a more significant impact on children's nutritional status. Previous research has demonstrated that even in situations of adequate food security, a lack of variety in food choices can still put children at risk of malnutrition and stunting.^[19] Additionally, factors such as nutrition education, culinary skills, and food expenditures play a significant role in determining the quality of consumed food. Food security that solely assesses physical access to food may not adequately represent effective nutritional intake. Therefore, more research is necessary to investigate the intricate relationships between food security, dietary practices, and children's nutritional status, as well as to understand how daily eating habits and food selections may more directly influence the risk of stunting.

The study results showed that there is no significant association between digital parenting and the prevalence of stunting ($p=0.378$). Although mothers who did not practice digital parenting had a lower proportion of stunted children (7%) compared to those who did (20.2%), this difference was not strong enough to be considered statistically significant.

The theory of media use states that digital technology can provide parents with quick and easy access to health and nutrition information.^[20] In the context of parenting, technology can be a useful tool for obtaining accurate information on how to care for and nourish children. However, these results suggest that digital parenting alone may not be enough to address stunting. It is possible that even though parents receive good information through digital media, the implementation of this information in daily practice may be hampered by other factors, such as limited resources, cultural habits, or inadequate social support.

In addition, although mothers who practice less digital parenting show a lower proportion of stunted children, this may indicate that more traditional physical interactions and parenting may have a greater positive impact on child growth. Previous research has shown that direct involvement in parenting, such as feeding, attention to hygiene, and positive social interactions, can be more influential in preventing stunting than simply getting information through technology.

Therefore, further research is needed to explore more deeply how digital parenting and traditional parenting patterns interact and how both can be optimized to support healthy child development. This entails assessing the impacts, both favorable and unfavorable, of technology in parenting and how it can be seamlessly integrated with established parenting practices to effectively reduce the risk of stunting.

In the context of stunting, cultural influences are often related to dietary practices, childcare methods, and health behaviors that are inherited from one generation to the next. Grounded in sociocultural theory, the customs and values characteristic of a culture can shape maternal and child health practices, especially regarding nutrition and care. A good or positive culture is usually associated with practices that support optimal child growth, such as ensuring balanced nutrition, cleanliness, and access to health services.^[21]

However, this study's results indicate that the correlation between cultural factors and the occurrence of stunting is not statistically significant ($p=0.805$). Despite this, mothers with less favorable cultural practices have a greater proportion of stunted children (16.1%) compared to those with more favorable cultural practices (11.1%). Each community has different cultural norms, which affect children's health directly and indirectly. ^[22] Simple measurements may not be enough to capture the complexity of culture, which can lead to statistically insignificant results. Culture does

not stand alone, but often interacts with socioeconomic factors, such as income, education, and access to health services. For example, mothers with good culture may be more exposed to health information and have better access to resources. Conversely, mothers with poor culture may face greater economic or social challenges. The interaction of these factors can obscure the direct influence of culture, so that a significant relationship is not seen. Although culture can influence family diets, there are many other variables that determine a child's nutritional status. For example, although a culture encourages the consumption of certain foods, the nutritional quality of those foods is also important. In some cases, cultures emphasize the consumption of foods that are rich in carbohydrates but low in protein or micronutrients, which may increase the risk of stunting even though the diet is considered 'good' from a cultural perspective.^[22-30]

These non-significant results may also indicate the need for more culturally specific interventions. Interventions based solely on culture may not be effective without addressing more specific local needs, such as adaptation to more modern nutritional practices or changes in parenting behaviors. In some communities, cultural factors may play a significant role in parenting practices, but culturally based interventions must be tailored to the local context to be effective.

Conclusion

The study's results show that there is no statistically significant relationship between knowledge, attitudes, actions, family support, the role of Posyandu cadres, food security, digital parenting, and cultural influences with the incidence of stunting in the Marusu Health Center region, as reflected by a p-value of 0.812, exceeding the acceptable threshold of 0.05.

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Ethical permission

The Ethics Committee for Health Research at the Faculty of Health Sciences "Maluku Husada" has issued an ethics permit to protect the human rights of individuals participating in health research, having reviewed the relevant research protocols. This approval can be identified by the registration number RK. 177 / KEPK / STIK / VIII / 2024.

Conflict of Interest

The author has indicated that there are no conflicts of interest present that require disclosure.

Contributing Authors

The roles of conceptualization, design, data collection, analysis, and interpretation of results were carried out by MKA. The manuscript submission was endorsed by MKA, with YY and PN contributing to the analysis, interpretation of the findings, and providing essential feedback for the manuscript's final version.

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