

Analysis of Community Capacity to Utilize Health and Environmental Sanitation Services with Stunting Risk in Coastal and Plantation Areas of Jember Regency

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ARTICLE INFO

Keywords: Stunting, Health Services, Environmental Sanitation, Coastal, Plantations

Received : 10 October

Revised : 15 November

Accepted: 30 December

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ABSTRACT

Stunting remains a major public health issue in Jember Regency, particularly in plantation and coastal areas. This study examined the relationship between community capacity to access health services, environmental sanitation, and stunting risk. A quantitative case-control design was conducted among 120 mothers of under-five children in the Silo II and Sabrang Health Center areas using path analysis. The findings indicate that community capacity and environmental sanitation are significantly associated with stunting, while utilization of maternal and child health services shows no significant effect. Poor sanitation, especially lack of latrines and improper wastewater management, and residence in plantation areas increase stunting risk. Targeted interventions based on geographic and social contexts are essential to reduce stunting prevalence

INTRODUCTION

Stunting is a chronic malnutrition problem caused by insufficient nutritional intake over a long period of time, resulting in stunted growth in children, resulting in a height that is shorter than the standard for their age (Bappenas, 2018). Short-term impacts of stunting include growth failure, impaired cognitive and motor development, and suboptimal physical size, potentially leading to metabolic disorders (Ardiah et al., 2022). Children who experience long-term stunting are at risk of reduced intellectual capacity, permanent structural and functional impairments in brain nerve cells, potentially leading to decreased learning ability during school age and decreased productivity as adults (Ardiah et al., 2022). Furthermore, metabolic disorders in children with stunting can increase the risk of disease. Stunting can be prevented by controlling existing risk factors (Bappenas, 2018).

The World Health Organization (WHO) (2023) stated that the global prevalence of stunting is 22.3%, while the target prevalence limit for stunting is less than 20% of the global toddler population. Indonesia has the second-highest burden of stunting in Southeast Asia and ranks fifth globally. The results of the 2022 Indonesian Toddler Nutritional Status Survey showed a stunting prevalence of 21.6% (WHO, 2023). Although stunting prevalence in Indonesia has decreased, it remains far from the target of the National Medium-Term Development Plan (RPJMN) of 14% by 2024 (Perpres RI, 2020). East Java has a stunting prevalence of 19.2% (Kemenkes RI, 2023). Jember Regency has the highest stunting prevalence in East Java, at 34.9% (Kemenkes RI, 2023).

The topography of Jember Regency, divided into plantation and coastal sectors, results in an uneven distribution of stunting prevalence. In line with research by Haile et al. (2016), the risk of stunting can stem from geographic and demographic factors within a region. Research in Ethiopia shows that stunting prevalence is not randomly distributed, but rather tends to be more prevalent in highland and midland areas compared to lowland areas (Haile et al., 2016). Differences in topography are closely related to community income, thus varying the ability of communities to access health services (Munawar, 2017). Topographical differences are not only related to income but also closely related to community health behaviors (Haile et al., 2016). These behaviors can be reflected in the achievements of Community-Based Total Sanitation (STBM) activities. Stunting prevalence varies according to geographic conditions. Research related to nutritional measurements is important, but program interventions that consider the diversity of case distribution based on geographic conditions are also crucial (Haile et al., 2016). Appropriate interventions tailored to geographic conditions are expected to result in more optimal programs and policies (Danila et al., 2018). Stunting program interventions can be implemented through specific and sensitive interventions to address the root cause (Bappenas, 2018). A 30% reduction in stunting prevalence depends on specific interventions, and a 70% reduction depends on sensitive interventions (Kemenkes RI, 2022). Sensitive interventions are implemented to prevent the long-term risk of stunting (Kemenkes RI, 2018).

LITERATURE REVIEW

Health geography, often called medical geography, is a field of research that incorporates geographic techniques into the analysis of health and the distribution of disease. Furthermore, health geography also studies the impact of climate and location on public health and the distribution of health services. Health geography is an important field because it aims to provide an understanding of health problems and improve public health based on the various geographic factors that influence them (Zain & Kuspriyanto, 2013). According to Barrett in Zain and Kuspriyanto (2013), health geography is the analysis of the relationship between the human environment and disease, nutrition, and health care systems to explain their interrelationships in space. Based on this definition, identifying the relationship between the three components related to the geography of disease, the geography of health services, and the geography of nutritional science, with analysis at a regional scale to integrate the three approaches (Pacion in Zain and Kuspriyanto, 2013).

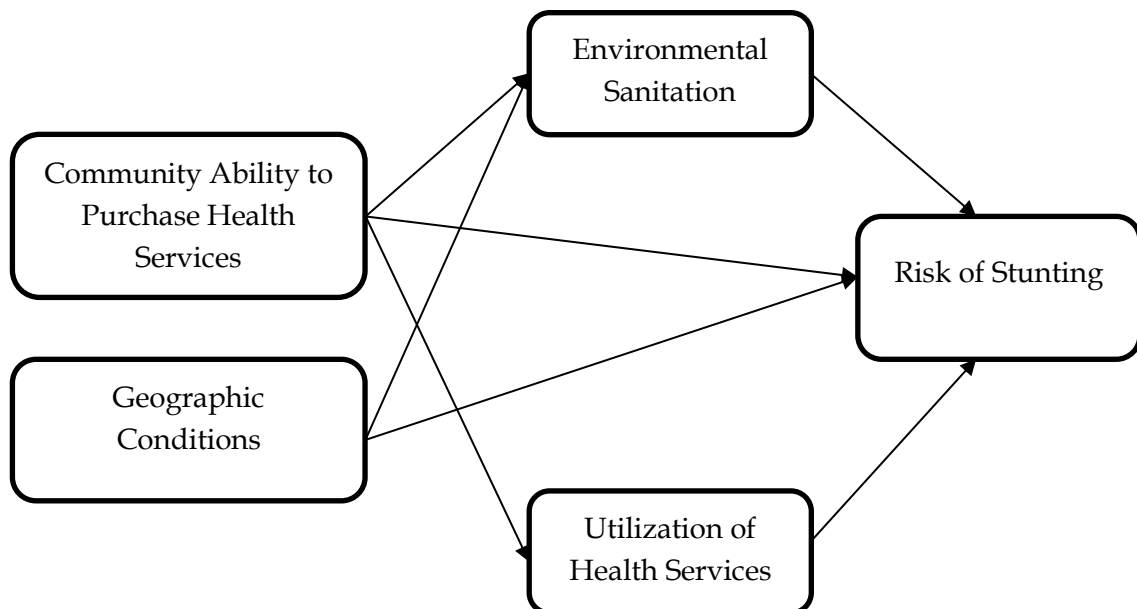


Figure 1. Conceptual Framework

Research hypothesis:

1. There is a correlation between the community's ability to afford health services and the prevalence of stunting in coastal and plantation areas in Jember Regency.
2. There is a correlation between the community's ability to afford health services and the utilization of health services in coastal and plantation areas in Jember Regency.
3. There is a correlation between the community's ability to afford health services and environmental sanitation in coastal and plantation areas in Jember Regency.
4. There is a correlation between geographic conditions and the prevalence of stunting in coastal and plantation areas in Jember Regency.

5. There is a correlation between the utilization of health services and the prevalence of stunting in coastal and plantation areas in Jember Regency.
6. There is a correlation between environmental sanitation and the prevalence of stunting in coastal and plantation areas in Jember Regency.
7. There is a correlation between environmental sanitation and the utilization of health services in coastal and plantation areas in Jember Regency.

METHODOLOGY

The type of research conducted is analytical research. This study uses a quantitative approach with a case-control study design. The location in this study is the working area of the Sabrang Health Center and Silo-II Health Center, Jember Regency. The population of this study were mothers of toddlers in the working area of the Sabrang Health Center, Jember Regency, totaling 2,509 toddlers and the Silo-II Health Center, Jember Regency, totaling 5,307 toddlers. So the population in this study was 7,816 toddlers. The research sample using the case-control formula obtained results of 120 samples. The sample determination in this study used a proportionate random sampling technique. Research data collection used a research questionnaire and interviews with respondents.

RESEARCH RESULT

Respondent characteristics in this study included age, number of children, gestational age, highest level of education, and occupation. All respondents were female. The characteristics of the respondents in this study are presented in the following table.

Table 1. Respondent Characteristics

No.	Respondent Characteristics	Number (n)	Percentage (%)
1.	Age		
	Adolescence (15-25)	70	29,2
	Early adulthood (26-35)	138	57,5
	Late Adulthood (36-45)	32	13,3
	Total	240	100
2.	Number of children		
	More than 2 children	106	44,2
	1-2 children	134	55,8
	Total	240	100
3.	Gestational age		
	<37 weeks	146	60,8
	37-42 weeks	87	36,3
	>42 weeks	7	2,9
	Total	240	100
4.	Educational level		
	Primary education (elementary and junior high school)	91	37,9
	Secondary education (high school)	127	52,9

Higher education (diploma, bachelor's, master's, doctoral)	22	9,2
Total	240	100
5. Type of employment		
Trader/self-employed	23	9,6
Farmer/farmer laborer	47	19,6
Privat employee	20	8,3
Housewife	150	62,5
Total	240	100

Table 1 shows that the majority of respondents were aged between 26 and 35 years, amounting to 57.5% (157 respondents). The 20-30 age range is the peak fertility age for women, so they have a high chance of having children at that age. Meanwhile, at the age of over 35, women's fertility begins to decline and there is a high risk of pregnancy (Mu'min, 2021). The majority of respondents had between 1 and 2 children, amounting to 55.8% (134 respondents). According to Badria and Bahrum (2020), the ideal number of children is 2 children. The number of children can affect the nutritional status of toddlers (Badria & Bahrum, 2021).

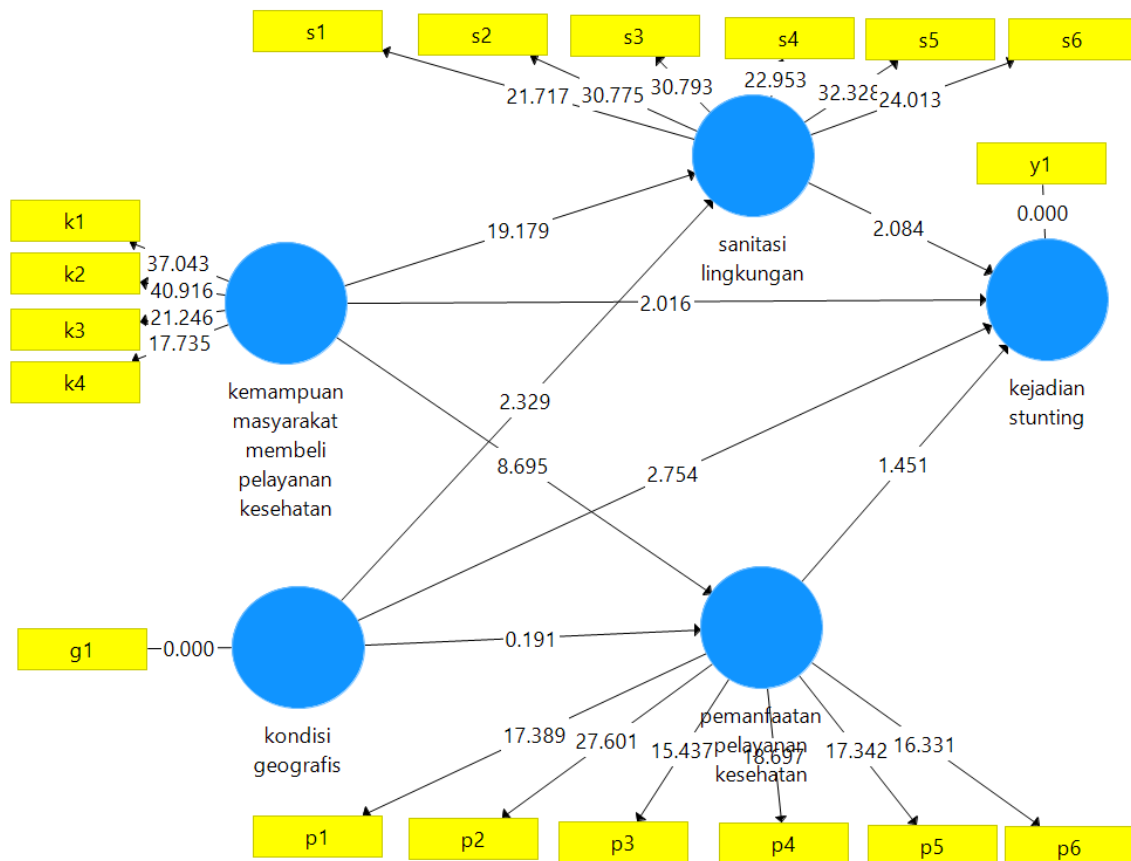


Figure 2. Bootstrapping Analysis

Table 2. Results of the Test of Influence Between Variables

	Original Sample (O)	T Statistics (O/STDEV)	P Values
kemampuan masyarakat membeli pelayanan kesehatan -> kejadian stunting	0.184	2.016	0.044
kemampuan masyarakat membeli pelayanan kesehatan -> pemanfaatan pelayanan kesehatan	0.403	8.695	0.000
kemampuan masyarakat membeli pelayanan kesehatan -> sanitasi lingkungan	0.673	19.179	0.000
kondisi geografis -> kejadian stunting	-0.176	2.754	0.006
kondisi geografis -> pemanfaatan pelayanan kesehatan	0.009	0.191	0.848
kondisi geografis -> sanitasi lingkungan	0.116	2.329	0.020
pemanfaatan pelayanan kesehatan -> kejadian stunting	0.091	1.451	0.147
sanitasi lingkungan -> kejadian stunting	0.187	2.084	0.038

Based on the results of the analysis using Partial Least Square (PLS), there is an influence between the variable of the community's ability to purchase health services on the prevalence of stunting (p-value = 0.044), there is an influence between the variable of the community's ability to purchase health services on the utilization of health services (p-values = 0.000), there is an influence between the variable of the community's ability to purchase health services on environmental sanitation (p-values = 0.000), there is an influence between the variable of geographical conditions on the prevalence of stunting (p-values = 0.006), there is no influence between the variable of geographical conditions on the utilization of health services (p-values = 0.848), there is an influence between the variable of geographical conditions on environmental sanitation (p-values = 0.020), there is no influence between the variable of utilization of health services.

DISCUSSION

The Influence of Community Affordability on Health Care Prevalence

The p-value of 0.044 (<0.05) indicates a significant effect between community affordability and stunting prevalence. Communities with better economic means have easier access to health care services such as prenatal care, immunizations, and child growth and development monitoring, which contribute to stunting prevention. This aligns with research conducted by Dibley et al. (2010) in *Maternal & Child Nutrition*, which states that financial access and affordability influence children's nutritional status. This aligns with previous research indicating a significant relationship between socioeconomic status and stunting in toddlers. The Chi-square test results showed a p-value of 0.043 (<0.05), indicating that socioeconomic status influences stunting (Badria & Bahrum, 2021). Furthermore, another study found that toddlers from families with low economic status were 2.608 times more likely to experience stunting than toddlers from families with high economic status (Sutriawan, 2020).

The Influence of the Community's Ability to Afford Healthcare Services on Healthcare Utilization

A p-value of 0.000 indicates a highly significant effect. This means that community purchasing power is closely correlated with healthcare utilization. Economically well-off communities are more likely to utilize healthcare services regularly. Research by Nugroho et al. (2018) in the *Journal of Public Health* also shows that household income is positively correlated with the utilization of basic healthcare services (Nugroho et al., 2018). Other research indicates that socioeconomic status significantly influences access to healthcare services. The socioeconomic status variable has a p-value of 0.007, indicating that increasing socioeconomic status is positively associated with increased access to healthcare services (Mustofa, 2022). According to Winda (2023), the income and employment status of the head of the household significantly influence healthcare utilization. The head of the household's income influences healthcare utilization, particularly in terms of healthcare financing.

The Influence of Community Affordability to Purchase Health Services on Environmental Sanitation

The p-value of 0.000 indicates a significant effect. High purchasing power enables communities to build and maintain adequate sanitation facilities. According to Prüss-Ustün et al. (2014) in a WHO report, a community's economic status influences household access to and quality of sanitation. Other studies have shown that socioeconomic indicators such as income, education, and ownership of sanitation facilities significantly influence access to adequate sanitation. Households with higher incomes tend to have better access to sanitation facilities (Febriani et al., 2020). Another study also found that family income is significantly related to environmental sanitation conditions, such as the presence of latrines and wastewater disposal systems. Families with higher incomes tend to have better sanitation facilities, which reduces the incidence of diarrhea in children under five. found that per capita family income is associated with environmental sanitation hygiene. Families with higher incomes tend to

have better sanitation practices, which positively impacts the nutritional status of children under five (Febriani et al., 2020).

The Influence of Geographical Conditions on Stunting Prevalence

A p-value of 0.006 (<0.05) indicates a significant effect. Geographically remote areas tend to have limited access to health services and nutritious food. This finding is supported by a study by Rahmawati et al. (2020) in the *Journal of Public Health Sciences*, which found that children in remote areas have a higher risk of stunting (Rahmawati et al., 2020). Geographical conditions are an important determinant of stunting prevalence in Indonesia. Factors such as topography, regional accessibility, and physical environmental characteristics can influence the availability and access to health services, sanitation, and food resources, all of which contribute to children's nutritional status. One relevant study is the study by Maria et al. (2020), which analyzed the determinants of stunting based on geographic region in Indonesia. This study used a Geographic Information System (GIS) approach to map stunting prevalence across provinces and found that differences in geographic and cultural conditions contributed differently to stunting prevalence in each region (Maria et al., 2020).

The Influence of Geographical Conditions on Health Service Utilization

A p-value of 0.848 (>0.05) indicates no significant effect between geographic conditions and health service utilization. This may be due to government programs such as mobile community health centers (Puskesmas) or integrated health service posts (Posyandu) that reach remote areas. Research by Arsyad et al. (2021) states that community-based interventions can reduce geographic barriers to health services (Arsyad, 2020).

The Influence of Geographical Conditions on Environmental Sanitation

A p-value of 0.020 indicates a significant effect. Difficult geographic conditions tend to have inadequate sanitation infrastructure. A study by Wulandari (2021) shows that geographic location and residential location influence community access to sanitation facilities. Geographical conditions are a determining factor in health service utilization. Areas with difficult topography, such as mountainous, island, or border areas, often face challenges in accessing health facilities. This can lead to low health service utilization by local communities (Devriany & Wulandari, 2021).

One relevant study is the study by Widiyastuty et al. (2021) analyzed factors related to health service utilization at the Entikong Community Health Center in Sanggau Regency. This study found that factors such as perceived need, health insurance, culture, and perception of illness were significantly associated with health service utilization. However, travel distance and travel time did not show a significant relationship, possibly due to community adaptation to local geographic conditions (Pratifri & Zuhana, N., Budiarto, E. Widyastuti, 2023).

The Effect of Health Service Utilization on Stunting Prevalence

The p-value of 0.147 (>0.05) indicates no significant effect. It is possible that other factors, such as service quality or family behavior, play a greater role. Research by Titaley et al. (2013) in BMC Public Health indicates that the quality of primary health care services also influences their impact on child nutrition.

The Effect of Environmental Sanitation on Stunting Prevalence

The p-value of 0.038 indicates a significant effect. Poor environmental sanitation can lead to recurrent infections such as diarrhea, which hinders a child's nutrient absorption. This finding aligns with findings from Spears (2013) in the Journal of Development Economics, which showed that poor sanitation practices are strongly correlated with low child height (stunting). Poor environmental sanitation is a major risk factor for stunting in toddlers. Inadequate sanitation conditions can increase exposure to infectious agents, such as diarrhea and worms, which ultimately impair a child's nutrient absorption and growth. This is in line with previous research which stated that children who live in environments with poor sanitation have a 2.94 times higher risk of experiencing stunting compared to those who live in environments with good sanitation (p-value = 0.022) (Wahdaniyah & Sar, 2022). A study in Duampanua Village, Anreapi District, showed that drinking water management (p=0.010), toilet facilities (p=0.002), and wastewater drainage (p=0.013) had a significant effect on the incidence of stunting in children (Azkia et al., 2023)

CONCLUSIONS AND RECOMMENDATIONS

Community economic capacity and environmental sanitation are the two factors that most consistently influence stunting. Meanwhile, geographic conditions influence stunting and sanitation, but not directly the utilization of health services due to government intervention. Furthermore, utilization of health services alone is insufficient to reduce stunting prevalence without improvements in service quality, health behavior, and environmental sanitation.

ADVANCED RESEARCH

This study used a case-control design, meaning it can only explain the relationship between variables without establishing a causal relationship. Data collection through questionnaires and interviews has the potential to introduce recall bias. Furthermore, the study did not analyze the quality of healthcare services or other factors such as parenting patterns, nutritional intake, and infectious diseases. The study's limited location within two community health centers (Puskesmas) also limits the generalizability of the results to a wider region.

ACKNOWLEDGMENT

Thank you to all parties involved in this research, especially the Jember Regency Government, Jember Regency Health Office, Silo-II Health Center and Sabrang Health Center, as well as all respondents who voluntarily helped provide data to researchers.

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