

Determinant Factors Related to Decreasing Stunting Rates in Garbasari Village, Badung Regency, Bali Province

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Abstract Introduction: In assessing the nutritional status of toddlers, stunting is an indicator of nutritional problems in toddlers. The purpose of this study was to determine the binary logistic regression model of the stunting rate in Garbasari village, and the factors associated with the stunting rate. Methods: This study uses secondary data from the reporting of Community-Based Nutrition. The samples in this study were all villages in the Badung Regency area, totaling 62 villages. Results: Villages with a low percentage of the population receiving health insurance assistance tend to have a low stunting rate of 2,657 times compared to those with a high percentage. Likewise, the high percentage of clean water coverage tends to have a lower stunting rate of 3.746 times. Furthermore, the high percentage of budget realization has a tendency of 7.989 times, the high percentage of pregnant women's class attendance has a lower tendency of 7.916 times and the high percentage of mothers' class attendance tends to be 6.654 times lower than those with low percentages. Conclusion: the percentage of budget realization, the class attendance of pregnant women, and the class attendance of mothers under five have a relationship with the stunting rate in Garbasari village.

Keywords Determinant Factors of Stunting,

Malnutrition, Garbasari Village

1. Introduction

One indicator of the success of a nutrition program is the low stunting rate in an area. Stunting is the number of nutritional status in an area which is calculated using the height for age index (TB/U) within a certain period time [1]. Stunting is caused by various multi-dimensional factors that generally occur in the first 1000 days of life [2], to overcome which requires community participation [3]. Stunting prevention in Badung Regency is realized by the declaration of the Healthy Badung Movement in the First 1000 Days of Life (Garbasari). The program aims to increase the role and capacity of the community in conducting data collection and monitoring as well as advocating for stunting prevention in villages [4].

One form of community participation in stunting reduction is the use of village funds [5]. Utilization of village funds is used for specific and sensitive nutrition interventions. Specific interventions only solve 30% of stunting nutrition problems, while sensitive nutrition

interventions can solve 70% [6]. Specific interventions are activities that directly address the occurrence of stunting and are generally provided by the health sector such as food intake, infection prevention, maternal nutritional status, and infectious diseases [7]. Meanwhile, sensitive interventions are activities related to indirect causes of stunting which are generally outside of health issues, namely the provision of drinking water and sanitation, nutrition and health services, increasing awareness of parenting and nutrition, and increasing access to nutritious food [8].

The role of mothers in the golden phase is very important in preventing child stunting [9]. Strengthening maternal nutrition from an early age must be carried out so that the mother's body is ready to undergo the prenatal phase for fetal development, which continues in the infant and toddler phase to adolescence [10]. Therefore, mothers need adequate knowledge to be able to feed their children optimally [11]. One of the efforts to increase knowledge is through class activities for pregnant women [12]. There is a significant relationship between class attendance for pregnant women and increased knowledge and attitudes about stunting prevention [13].

Poor environmental sanitation such as inadequate access to clean water contributes to an increase in infectious diseases such as diarrhea and intestinal worms [14]. The disease can cause linear growth disorders and can increase mortality in children under five [15]. Likewise, health insurance plays a role in improving the nutritional status of children under five. Research in Uganda concluded that community-based health insurance contributed to reducing stunting rates by 4.3 % per year [16].

2. Method

The type of research is observational study. This research was carried out from May to July 2022. The study was conducted in Badung Regency with 711.300 residents, and 11.998 pregnant women, 28.167 toddler. This research uses secondary data from the Electronic Reports for Recording and Reporting on Community-Based Nutrition, Badung Regency Health Office in 2021. Data processing was carried out at the Public Health Study Program, Udayana University Bali. The variables used in this study consisted of the dependent variable (response variable), namely the percentage of stunting rate (Y) which was denoted by 0 for $y \leq 14\%$ (threshold) of stunting rate and 1 for $y > 14\%$ stunting rate and the independent variable (predictor) namely the percentage of health insurance assistance (X1) denoted by 0 for low ($\leq 2.06\%$) and 1 for high ($> 2.06\%$), the percentage of clean water coverage (X2) is denoted by 0 for high ($\geq 74\%$) and 1 for low ($< 74\%$), the

percentage of budget realization (X3) is denoted by 0 for high ($\geq 80\%$) and 1 for low ($< 80\%$), the percentage of class attendance for pregnant women (X4) is denoted by 0 for high ($\geq 80\%$) and 1 for low ($< 80\%$) and the percentage of class attendance for mothers under five (X5) is denoted by 0 for high ($\geq 15.8\%$) and 1 for low ($< 15.8\%$).

The steps of data analysis are as follows:

1. Secondary data collection
2. Set the stunting threshold value of 14% (according to the regulation of the Minister of Health of the Republic of Indonesia)
3. Determine the logistic regression model
4. Test the partial hypothesis using the Wald. test statistic
5. Analyze the relationship of each binary variable using the odds ratio
6. Draw conclusions based on the results of the analysis obtained.

3. Results and Discussion

3.1. Results

In Table 1, it can be seen that the variables receiving health insurance assistance in the high category were villages (53.2%) and in the low category were 29 villages (46.8%); clean water coverage with high category as many as 33 villages (53.2%) and with low category as many as 29 villages (46.8%); the percentage of budget realization in the high category was 32 villages (51.6%) and the low category was 30 villages (48.4%); percentage of class attendance of pregnant women in the high category as many as 34 villages (54.8%) and in the low category as many as 28 villages (45.2%); the percentage of class attendance of mothers under five in the high category was 20 villages (32.3%) and the low category was 42 villages (67.7%); the percentage of high stunting rates was 32 villages (51.6%) and the percentage of low stunting was 30 villages (48.4%).

It can be seen in Table 2, to find out whether there is a relationship between several variables and the stunting rate, it is necessary to do the Odd Ratio Test with the following results; the percentage of the population receiving guarantee assistance health with p-value 0.273 and clean water coverage c with p-value 0.145 which indicates that there is no significant relationship with the stunting rate in Garbasari village. Meanwhile, the other 3 variables are the percentage of budget realization (p -value 0.005), the percentage class attendance of pregnant women (p-value 0.043) and class attendance percentage of mothers under five (p-value 0.044) which means that there is a significant relationship with stunting rates in Garbasari village.

Table 1. Characteristics of Participating Villages in the Badung District

Variable	Category	Frequency	Percent
Presence of Mother Toddler Class	High	32	51.61
	Low	30	48.39
Clean Water Coverage	High	29	46.77
	Low	33	53.23
Budget Realization	High	32	51.61
	Low	30	48.39
Presence of Pregnant Women Class	High	38	61.29
	Low	24	38.71
Health insurance recipient	Low	33	53.23
	High	29	46.77

Source: Processed data

Table 2. Partial Test Results

	B	SE	Wald	df	Sig.	Exp(B)
Step 1 ^a % of population receive health insurance assistance	.977	.891	1.204	1	.273	2.657
% Clean Water Coverage	1.321	.859	2.366	1	.124	3.746
% Budget Realization	2.067	.821	6.333	1	.012	7.898
% Class Attendance for pregnant women	2.069	.852	5.898	1	.015	7.916
% Mother Toddler Class Attendance	1.895	.849	4.980	1	.026	6.654
Constant	-4.039	1.126	12.861	1	.000	.018

By paying attention to the results of the partial test, the binary logistic regression model for stunting in Garbasari Village is obtained as follows:

$$\pi(x) = \frac{\exp(-4.039 + 2.037X_3 + 2.069X_4 + 1.895X_5)}{1 + \exp(-4.039 + 2.067X_3 + 2.069X_4 + 1.895X_5)}$$

Interpretation of Odds Ratio Value

Based on the value of the odds ratio seen from the value of exp (β) from the output of the partial test, the magnitude of the difference in the tendency of each predictor variable is as follows:

a. Percentage of Population Received Health Insurance Assistance (X1)

The chance that garbasari village with a low percentage of the population receiving health insurance assistance has a low stunting rate tendency (≤14%) is 2.657 times that of garbasari village with a high percentage of the population receiving health insurance assistance.

b. Percentage of Clean Water Coverage (X2)

The chance that Garbasari village with a high percentage of clean water coverage has a low stunting rate tendency

(≤14%) is 3.746 times that of Garbasari village with a low percentage of clean water coverage.

c. Percentage of budget realization (X3)

The opportunity for garbasari villages with a high percentage of budget realization to have a low stunting rate tendency (≤14%) is 7.989 times that of garbasari villages with a low percentage of budget realization.

d. Percentage of class attendance of pregnant women (X4)

The chance that garbasari village with a high percentage of pregnant women class attendance has a low stunting rate tendency (≤14%) is 7.916 times that of garbasari village with a low percentage of pregnant women class attendance.

e. Percentage of class attendance of mothers under five (X5)

The chance that garbasari village with a high percentage of mother class attendance has a low stunting rate tendency (≤14%) is 6.654 times that of garbasari village with a low percentage of mother class attendance of toddlers.

3.2. Discussion

The stunting rate in Badung Regency in 2021 is 8.9%.

This figure has decreased when compared to the stunting rate in 2018 which reached 20,6%. The reduction in the stunting rate occurred due to the government's commitment to addressing the problem of stunting, including establishing regulations, involving an integrated stunting prevention team, building an information technology system and carrying out counseling and coaching to pregnant women and mothers of toddlers. The implementation of regulation made by Badung's Government is through Garbasari Program translates as Badung Movement First 1000 Days of Life. This program including supplementary feeding for pregnant women and underweight toddlers, blood supplementary tablets for adolescents and pregnant women, breastfeeding promotion and counseling, infant and child feeding promotion and counseling and growth monitoring and promotion. Experience in several countries shows that malnutrition is preventable and can be eliminated through a multisectoral strategic approach. Implementing an effective multisectoral approach to preventing child malnutrition will require not only financial investment but also the collective efforts of various government ministries, UN-affiliated agencies and non-governmental organizations [17].

Stunting is common in the first 1000 days of a child's life which can be anticipated through prevention efforts [18]. Research in San Vicente, Guatemala by the US Agency for International Development (USAID) confirmed that pathogen exposure, nutrition, and prenatal health are important causes of stunting [19]. Intervention activities in the first 1000 days of life include feeding, care, parenting activities; and treatment of infections/diseases, as well as increasing access and quality of nutrition and health services; and increasing the provision of clean water and sanitation facilities [20]. Meanwhile, stunting prevention interventions at the individual level should focus on improving women's nutrition to reduce the size of low birth weight babies, improving household hygiene to reduce diarrhea and promoting complementary feeding and appropriate feeding practices. At the community level, interventions were implemented through cash transfer programs, especially among uneducated mothers from low socioeconomic backgrounds [21].

Analysis of the Relationship between Village Fund Budget Realization and Decreasing Stunting Rates

The results of the Odds Ratio (OR) analysis with a Confidence interval (CI) of 95% show that there is a significant relationship between the percentage of realization of the village fund budget and the stunting rate. In 2020, the budget allocated for *stunting prevention* in Badung Regency is 2.4 billion. This budget is sourced from the Central Government, Bali Provincial Government and Badung Regency Government. In addition, the Village Minister Regulation and PDT Number 16 of 2018 concerning Village Fund priorities encourage villages to

allocate village funds for stunting prevention. This fund is used for health education activities, target data collection, nutrition surveillance, coaching and training [22].

Adequate health budget allocations can accelerate stunting reduction [23]. Research in Peru shows the importance of the government's commitment to reducing chronic malnutrition in children under five by 5% in 5 years by improving coordination between government and non-government agencies, implementing nutrition strategies at all levels of government and allocating funds to combat malnutrition [24]. Similarly research in Tanzania shows that to promote sustainable implementation of other nutrition interventions should be allocated more funding and guidance should be accompanied by the procurement of tools that enable planning and budgeting at the district level [25]. The results summarize the important life cycle empirical literature on a credible estimate of the benefit-cost ratio for a range of nutritional interventions to reduce stunting. Using the assumption of an increase in income (11%), it is found that the average cost-benefit estimate is between 3.8 (Democratic Republic of Congo) and 34.1 (India). The average benefit-cost ratio is 18 (Bangladesh). The value of stunting prevention far exceeds what is described in economic statistics because preventing pain, emotional suffering, and loss is very difficult to estimate to have a higher value than the potential economic benefits [26].

Analysis of the Relationship between Class Visits for Pregnant Women and Stunting Rates

The results of the binary logistic regression test showed that there was a significant relationship between class visits of mothers under five in Garbasari village with stunting rates. This is in line with the results of a study in India which concluded that the provision of nutrition education and a diet plan based on iron-rich foods was significantly associated with increased food intake, nutritional knowledge about anemia and iron-rich foods [27]. The incidence of stunting is caused by many things, one of which is the behavior of providing nutrition to toddlers which is strongly influenced by the mother's knowledge of toddler nutrition [28]. Research in Ethiopia also concluded that nutrition education during pregnancy by health care providers can improve knowledge and practices of mothers during pregnancy. Thus, attention should be paid to promoting nutrition education in ANC for pregnant women to obtain reliable and accurate information from health workers [29]. Until now, there has been no research on the level of knowledge of pregnant women or women planning a pregnancy on nutritional status in Badung Regency. Therefore, the research took examples from similar studies in other districts. The results of the study in Sleman Regency also showed that in families with low economics there were no cases of stunting in toddlers, this was due to the feeding pattern of toddlers with a frequency of three times a day with staple foods and complementary foods

with good nutritional value [30].

Furthermore, with regard to media dissemination of information, research on groups of pregnant women in America concluded that social media is not expected to replace these traditional sources, but rather serves as a complementary source [31]. Other studies have shown a significant impact that the use of social media has a negative impact on pregnant women. Recommendations from health team members suggest increasing maternal counseling and support by encouraging a healthy body image, diet and lifestyle behaviors during pregnancy [32].

Analysis of the Relationship between Mother Toddler Class Visits and Stunting Rates

Mothers of overweight toddlers have inaccurate perceptions of their toddler's body size and show the view of heavy toddlers as normative. Mothers of underweight toddlers have accurate perceptions but show recognition of their child as out of the norm. Therefore, child health care providers should help increase families' understanding of healthy body size [33].

Adequate intake of dairy, vegetables, and whole fruits can be a quick assessment tool to screen toddlers for nutritional risk. Mothers with poor diets tend to have toddlers with poor diets; low intake of fruits, vegetables, and dairy foods is a marker of poor dietary quality in mothers [34]. The results of research on mothers of toddlers who use social networking sites Facebook and Twitter show that Social networking sites (SNS) are the right media to share information about their children, lifestyle changes after giving birth and child-related content. These findings have implications for increasing the utility and usefulness of SNS for mothers under five, as well as improving sociotechnical systems related to maternal and child health [35]. Similarly a study in the UK shows that mothers of toddlers find a social media-based approach well positioned to provide child care and support during the COVID-19 pandemic [36].

4. Conclusions

The percentage of stunting prevention budget realization, percentage of class attendance of pregnant women and percentage of class attendance of mothers under five in Garbasari village were significantly related to stunting rate in Garbasari village. The probability of a garbasari village with a low percentage of the population receiving health insurance assistance has a low stunting rate trend of 2.657 times compared to a garbasari village that does not receive health insurance assistance. Likewise, Garbasari village with a high percentage of clean water coverage has a tendency for a low stunting rate of 3.746 times compared to Garbasari village with a low percentage of clean water coverage. Furthermore, Garbasari village with a high percentage of budget realization has a tendency for a low

stunting rate of 7.989 times compared to Garbasari village with a low percentage of budget realization. Garbasari village with a high percentage of attendance for pregnant women has a tendency to have a low stunting rate of 7.916 times compared to Garbasari village with a low percentage of attendance for pregnant women. Garbasari village with a high percentage of mother class attendance has a low stunting rate trend of 6.654 times compared to Garbasari village with a low percentage of mother under five class attendance.

5. Suggestion

The village government's commitment is needed to allocate an adequate budget for stunting prevention activities on an ongoing basis, and it is necessary to carry out regular education to pregnant women and mothers of children under five through counseling in groups or through social media.

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