Participation in the movement to prevent and overcome stunting (gambang stunting) program reduces the risk of stunting

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Abstract. Malnutrition remains the biggest challenge in all regions, with a stunting prevalence of 16.4% in 2023 and a stunting prevalence of 4.51% in Sleman District, making the Gambang Stunting Program a comprehensive effort to prevent stunting. The objective is to reveal the relationship between participation in the Gambang Stunting Programme and the incidence of stunting. Methods of this research use a cross-sectional study design was used on 332 mothers of toddlers with random sampling techniques. Instruments for participation in the Gambang Stunting Program and for stunting incidence used questionnaires. Data analysis used the chi-square test and binary logistic regression test. Results is Chi-square analysis showed a significant association (p=0.03), indicating a notable association between participation in the Gambang Stunting Program and stunting incidence. There were no dominant factors for stunting incidence after controlling for maternal education, maternal age, Head of household occupation, family income, child gender, and source of information. There was a positive relationship between participation in the Gambang Stunting Program and stunting incidence, while confounding factors had no significant effect. These findings emphasize the importance of increasing family participation, parenting patterns, and the competence of health services in accelerate the reduction of stunting.

1 Introduction

WHO reports that malnutrition in all its forms remains one of the biggest challenges in global health [1]. In 2022, the prevalence of under nutrition, especially in the wasting category, was still the highest compared to other nutritional problems, despite having decreased to 14.7%. The dual challenge of malnutrition currently plagues the world, characterised by high prevalence of undernutrition and increasing problems of overnutrition. Global data shows that around 148 million children under five are stunted and 45 million children are wasted. Sustainable Development Goals (SDGs) indicators show that in 2022, the prevalence of wasting decreased by 2.4%, from 9.2% to 6.8% [2].

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The incidence of underweight toddlers in the Special Region of Yogyakarta (DIY) in 2024 was recorded at 10.73%, while the prevalence of stunting reached 16.4%. Based on the 2024 report from the Sleman District Health Office, the incidence of stunting is highest at the Minggir Community Health Center at 8.50%. In terms of service coverage, in 2022, the percentage of toddlers receiving services in accordance with the Minimum Service Standards (SPM) for Toddlers in Sleman Regency reached 83.41%, while the coverage of toddler weighing in 2024 was recorded at 74.29% [3].

Global efforts have been made, such as UNICEF nutrition programs and national policies through Presidential Regulation No. 72/2021. Previous research has shown a notable association between family participation in health programs. The research results indicate a notable association between family participation rate in the implementation of the Gammara'na programme and decrease in stunting incidents. In addition, the effectiveness of the Stunting Reduction Acceleration Program in Batumandi District has been quite effective in reducing the number of stunted toddlers, with an achievement rate of 45% [4]. In Sleman, the innovation of the Movement to Weigh, Prevent, and Overcome Stunting (Gambang Stunting) is regulated through Regency Regulation No. 22.1/2021 involving growth and development monitoring, nutrition education, and supplementary feeding [5].

Participation in toddler classes contributes to stunting prevention through active participation in toddler mother classes [6]. Previous studies have focused more on maternal factors, parenting patterns, and nutritional interventions, but have not yet quantitatively explored the direct relationship between family participation in Gambang Stunting and the incidence of stunting.

Sleman Regency has made comprehensive efforts to prevent stunting through the Gambang Stunting Program (Movement to Weigh, Prevent, and Overcome Stunting). This study aims to reveal the relationship between participation in the Gambang Stunting Programme and the incidence of stunting. The findings of this study are expected to provide input for strengthening strategies to accelerate the reduction of stunting in Sleman. In addition, this research has provided evidence on the efficacy of family involvement in the Gambang Stunting Programme and has presented policy recommendations to enhance the quality of implementation by strengthening the roll of families, health workers, and cross-sectoral cooperation.

2 Methods

This study is a quantitative analytical survey with a cross-sectional research design. It was conducted in the Minggir Community Health Center working area. The population in this study consisted of mothers of children aged 0-59 months who had participated in the Gambang Stunting program. A sample of 332 was obtained using random sampling. Primary data was collected and used using a questionnaire. Data on stunting status based on height/length measurements and age of toddlers was obtained through questionnaires filled out by respondents' mothers, who were asked to provide their children's age (in months) and latest height/length measurements recorded in their KIA/KMS books.Next, the Z-score was calculated by the researcher using the WHO Anthro application. Infants were categorized as stunted if the TB/U Z-score was < -2 SD, and normal if it was ≥ -2 SD. Data processing was carried out using univariate, bivariate, and multivariate analysis.

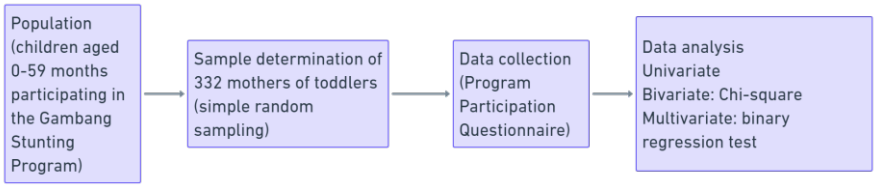

Fig. 1. Research method flow.

3 Results and discussion

3.1 Characteristics of respondents

Table 3.1 Characteristics of respondents (n=332)

Characteristic	Sub-characteristic	Frequency	Presentation (%)
Mother's education	Primary	42	12,7
	Secondary	185	55,7
	Higher	105	31,6
Mother's age	<20 years old	4	1,2
	20-35 years old	220	66,3
	>35 years	108	32,5
Head of household occupation	Not working	1	0,3
	Working	331	99,7
Child's gender	Male	159	47,9
	Female	173	52,1
Family income	<2.125.879,62	173	52,1
	>2.125.879,62	159	47,9
Information source	1 Source	141	42,5
	>2 Source	191	57,5

Table 3.1 states that most respondents were mothers with secondary education (55.7%) and aged 20–35 years (66.3%). Almost all heads of households were employed (99.7%). The gender of the children was relatively balanced, with slightly more girls (52.1%). More than half of the families had an income below the minimum wage of IDR 2,125,879.62 (52.1%). Most respondents obtained information from more than two sources (57.5%).

3.2 The relationship between the gambang stunting program and the incidence of stunting

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Variable	Incidence of Stunting				
Gambang Stunting Program	Normal		Stunting		P *Value*
	N	%	N	%	
Good	219	85,2	56	74,7	0,03
Poor	38	14,8	19	25,3	
Total	257	100	75	100	

Results of the chi-square test, Asymp. Sig (2-tailed) value was 0.03, indicates that there is a positive correlation between the implementation of the Gambang Stunting Programme and the prevalence of stunting among toddlers. Toddlers whose mothers participated in the

program in the poor category had a higher proportion of stunting (25.3%) compared to those in the good category (14.8%).

3.3 Multivariate

Table 3.3 Binary logistic regression test

Variable	B	S.E	Wald	df	Sig.	Exp(B)
Mother's education	0,29	0,22	1,72	1	0,19	1,34
Mother's age	0,31	0,27	1,238	1	0,27	1,36
Head of household's occupation	22,41	40192,99	0,000	1	1	53776
Family income	-0,43	0,29	2,24	1	0,13	0,65
Child's gender	-0,18	0,27	0,41	1	0,52	0,84
Source of information	0,44	0,28	2,48	1	-0,12	1,55

The regression results showed that none of the independent variables significantly affected stunting incidence ($p<0.05$). Maternal education, age, income, child gender, and information sources were not significant predictors. Although the head of household's occupation had a high odds ratio, it was statistically insignificant. This suggests that stunting is influenced more by other factors beyond basic sociodemographic conditions.

3.4 Discussion

The chi-square analysis shows a significant relationship between participation in the Gambang Stunting Program and the incidence of stunting ($p=0.03$). Toddlers whose mothers participated in the program with a poor rating had a higher proportion of stunting (25.3%) compared to those with a good rating (14.8%). This confirms that the Gambang Stunting program plays an important role in reducing the risk of stunting through nutritional status monitoring, education, and the provision of supplementary food as needed. According to the Theory of Planned Behavior, a relevant conceptual framework for understanding the psychosocial factors that influence attitudes, subjective norms, and behavioral control in society, nutrition education using online digital platforms to improve mothers' behavior in providing nutritious complementary foods, the relationship between community participation and the success of education implementation is complex and mutually influential [7].

These findings are consistent with research [8] showing that mothers' active participation in health posts in monitoring toddler growth facilitates early detection of nutritional status. Based on research in Enrekang District, there is a significant relationship between the level of family participation in the Gammara'na program and a decrease in stunting rates. Families and program implementers indicate that health-conscious families are an effective approach to preventing stunting [9]. Discussions about successes, obstacles, and experiences during the implementation of activities became a shared learning process that ensured the optimal delivery of information on stunting prevention [10].

The chi-square analysis revealed a significant association between mothers' participation in the Gambang Stunting Program and stunting incidence ($p=0.03$). Children of mothers with lower participation levels had a higher risk of stunting. This finding highlights the program's importance in improving growth monitoring and nutrition education. Based on the Theory of Planned Behavior, community involvement and maternal behavior change play an essential role in achieving sustainable stunting prevention [7].

These findings are consistent with research [8] showing that mothers' active participation in health posts in monitoring toddler growth facilitates early detection of nutritional status. Similar findings were reported in another studies, where family participation in local nutrition

programs significantly reduced stunting prevalence [9]. Evidence from community-based interventions in other countries also supports that regular monitoring, family empowerment, and multi-sectoral collaboration can improve child growth outcomes [10]. These results affirm that collective participation is crucial for the success of stunting prevention efforts [15].

The regression analysis showed that confounding variables such as maternal education, age, family income, child gender, and information sources were not significantly associated with stunting ($p>0.05$). These results contrast with some previous studies identifying these factors as major determinants. However, other research found similar outcomes to this study, indicating that sociodemographic characteristics alone may not directly influence stunting but are mediated by contextual aspects such as access to information, family support, and maternal health behaviors [11].

Economic conditions may indirectly affect stunting through food access and utilization of health services, yet no significant association was observed in this study [12]. Studies have shown that families with higher income levels tend to meet children's nutritional needs more effectively, as better economic stability ensures food availability and access to health care. Additionally, paternal employment contributes to children's nutritional well-being, as toddlers with unemployed fathers are more prone to stunting. International findings also report that children from wealthier households have a significantly lower risk of stunting than those from poorer families [13].

Child gender was also not significantly related to stunting in this study, aligning with some literature showing no strong association [11]. Nevertheless, a number of studies indicate that boys may be slightly more vulnerable to stunting due to greater susceptibility to infection and nutritional deficiencies [12], [14]. Furthermore, information sources, while crucial for enhancing parental knowledge, were not significantly linked to stunting outcomes. Differences across studies may result from variations in how information is applied within daily parenting practices [15].

Overall, these results suggest that stunting arises from complex, multifactorial interactions rather than single demographic determinants. Effective prevention therefore requires strengthening family participation, improving the practical application of nutrition information, and enhancing cross-sectoral collaboration in public health interventions.

4 Conclusion

This study shows a significant relationship between participation in the Gambang Stunting Program and the incidence of stunting at the Minggir Community Health Center, where toddlers with low program participation have a higher risk of stunting than those with good participation. However, factors such as maternal education, maternal age, Head of household occupation, family income, child gender, and source of information were not found to have a significant effect. These findings emphasize the importance of increasing family participation in the program and the need to strengthen behavioral aspects, parenting patterns, and the quality of health services to accelerate the reduction of stunting.

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Author Contributions

Sulistyaningsih: conceptualization, methodology, supervision, validation.
Awwal Al-fauzia N: data collection, analysis, initial draft writing.

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