http:// jpp.mums.ac.ir

Original Article (Pages: 19540-19551)

Stimulation of Child Growth and Development and Nutritional Status Among Children Aged 24-59 Months: A Cross-Sectional in Indonesia

Fadira Nurifa Fawaida [1], * Tantut Susanto [2], Fahruddin Kurdi [2], Wahyuni Fauziah [3]

[1] Department of Nursing, Faculty of Nursing, Universitas Jember, Jember, East Java, Indonesia.
[2] Department of Community Family and Geriatric Nursing, Faculty of Nursing, Universitas Jember, Indonesia.
[3] Nursing Council, Indonesian Health Council, Jakarta, Indonesia.

Abstract

Background: Stunting remains a significant global nutritional issue, with Indonesia's prevalence at 21.5% in 2023, and Jember Regency in East Java recording a high prevalence of 29.7%. Inadequate care, including insufficient stimulation and child activities, is identified as a contributing factor to stunting. This study aims to analyze the relationship between family-provided growth and development stimulation and the incidence of stunting in children aged 24-59 months in Jember Regency.

Materials and Methods: This study used a quantitative analytical method with a case-control design. A total of 174 respondents were selected through stratified random sampling, comprising 87 stunted children in the case group and 87 children with normal nutritional status in the control group, all from the working areas of Rambipuji, Sumberjambe, and Ledokombo Community Health Centers in Jember Regency. Data were collected using questionnaires on family and children characteristics, and family-provided stimulation, along with anthropometric measurements (height and weight) analyzed using WHO Anthro software. The relationship between variables was analyzed using the Chi-square test.

Results: There is a significant relationship between family-provided growth and development stimulation and the incidence of stunting in children aged 24-59 months in Jember Regency (χ^2 = 7.452; p = 0.006). Children who received adequate stimulation had a 2.43 times greater chance of not experiencing stunting than those who received inadequate stimulation (OR = 2.43; 95% CI = 1.32-4.47).

Conclusion: Adequate family-provided stimulation plays a significant role in preventing stunting among children aged 24-59 months. Strengthening parental awareness and skills in delivering age-appropriate stimulation should be integrated into community health programs, as part of efforts to reduce stunting.

Key Words: Children Growth and Development, Family Stimulation, Nutritional Status, Preschool Child, Stunting.

* Please cite this article as: Nurifa Fawaida F, Susanto T, Kurdi F, Fauziah W. Stimulation of Child Growth and Development and Nutritional Status Among Children Aged 24-59 Months: A Cross-Sectional in Indonesia. J Ped Perspect 2025; 13 (7):19540-19551. **DOI: 10.22038/jpp.2025.89981.5575**

****Corresponding Author:***

Prof. Ns. Tantut Susanto, S.Kep., M.Kep., Sp.Kep.Kom., Ph.D; Jalan Kalimantan No. 37, Jember, Jawa Timur, 68121, Indonesia. Tel: (0331) 323450; Fax: (0331) 323450; Email: tantut_s.psik@unej.ac.id

1- INTRODUCTION

Stunting remains a chronic nutritional problem that has not yet met the global reduction target set by the World Health Assembly (WHA) and the Sustainable Development Goals (SDGs) (1). Globally, the reduction in stunting from 2012 to 2022 has only reached 1.65%, which is far below the target of 6.08% (1). In Indonesia, the prevalence of stunting in 2023 is recorded at 21.5%, with a very small decrease of 0.1% from the previous year, while the national target is 14% (2,3). East Java Province is one of the regions with the highest stunting cases, with Jember District recording a prevalence of 29.7% (2,4). Specifically, children aged 24-35 months had the highest prevalence of stunting at 25.7%, followed by those aged 36-47 months and 48-59 months (4).

Child growth and development is a continuous process that is strongly influenced by genetic and environmental factors, especially during the first 1000 days of life, known as the golden period (5). After the age of two, the speed of growth and development tends to be more stable, but still depends on the environment and family parenting (2,6). In the WHO conceptual framework of the causes of stunting, inadequate care, including lack of stimulation, is one of the significant household factors (7). Children who receive purposeful and regular stimulation, such as verbal interaction, educational play, and emotional support, tend to have better brain development and adaptability, thus lowering the risk of stunting (8,9).

The role of the family is crucial in supporting children's growth and development by providing adequate stimulation, and in carrying out its functions through health program approaches such as the Healthy Indonesia Program with a Family Approach (10,11). Inadequate stimulation can worsen the impact of stunting because children are unable to respond optimally to nutritional intake and their environment (12). Therefore, the high stunting rate in Jember Regency may be influenced by the low family-provided growth and development stimulation. This highlights the importance of conducting research to analyze the relationship between family-provided growth and development stimulation and the incidence of stunting in children. Accordingly, this study aims to analyze the relationship between family-provided growth and development stimulation and the incidence of stunting in children aged 24–59 months in Jember Regency.

2- MATERIALS AND METHODS

2-1. Study Design

This study utilized a correlational quantitative design with a case control approach. The research took place in the working areas of the Public Health Centers of Sumberjambe, Ledokombo, and Rambipuji in May 2025.

2-2. Participants

The study population comprised families with children aged 24–59 months residing in the catchment areas of Rambipuji, Sumberjambe, and Ledokombo Community Health Centers, Jember Regency. A total of 3,995 families were identified, including 695 with stunted children and 3,300 with non-stunted children.

Through stratified random sampling by sub-district and priority stunting villages, 174 participants were choosen—87 in the case group (stunted, HAZ < –2 SD) and 87 in the control group (normal height, HAZ ≥ –2 SD). Inclusion criteria required children to be registered at the local posyandu and cared for by their nuclear family. Exclusion criteria included congenital abnormalities, chronic illness, physical or intellectual disabilities,

hospitalization exceeding seven days, or refusal to participate.

2-3. Data Collection Procedures

Data were collected through structured questionnaires and anthropometric measurements. Sociodemographic variables covered family (age, education, occupation, income, number of children) and child characteristics (age, sex, breastfeeding history, immunization status). Family-provided stimulation was assessed using an adapted questionnaire from the Maternal and Child Health Book, with 24–29 age-specific items scored as "Yes" (1) or "No" (0), categorized as adequate or inadequate based on the mean score for each age group.

Nutritional status was assessed using a portable stadiometer and digital scales, with z-scores computed via WHO Anthro software. Measurements were conducted during home visits by the research team and posyandu cadres after obtaining written informed consent.

2-4. Data Analysis

Categorical data were presented as frequency and percentage, while numerical data were presented as mean, median and standard deviation. The relationship between family-provided growth and development stimulation and the incidence of stunting in children was examined using the Chi-Square test, with a significance level of $p < 0.05$. In addition, to determine the risk of the relationship between variables, the Odds Ratio (OR) was calculated. Differences in z-score values of nutritional status, weight, and height between case and control groups were analyzed using the Mann-Whitney test due to the non-normal distribution of the data.

2-5. Research Ethics

This study received approval from the Health Research Ethics Committee (KEPK) of the Faculty of Nursing, University of Jember (No. 247/UN25.1.14/KEPK/2025).

3- RESULTS

Table 1 shows that in the case group, the largest proportion of mothers had a junior high school education (50.57%), while the smallest proportion had no formal education or did not attend school (8.05%). Most mothers in this group were unemployed (98.85%). In the control group, most mothers had a high school education (80.46%) and a small proportion had a diploma or bachelor's degree (8.05%). The largest proportion of mothers in this group were unemployed (74.71%).

Table 2 reveals that in the case group, the largest proportion of children had a history of exclusive breastfeeding for 6 months (55.17%), and all had received complete immunization according to their age (100%). In the control group, most children had a history of exclusive breastfeeding for 6 months (75.86%), and all had received complete immunization according to their age (100%).

Table 3 indicates that the average stimulation score for children aged 24-35 months was 19.72, for those aged 36-47 months was 16.95, and for those aged 48-59 months was 19.11. Children who scored below the average for their age group were categorized as receiving inadequate stimulation, while those who scored equal to or higher than the average were categorized as receiving adequate stimulation. The Mann-Whitney test identified a significant difference between the case and control groups for ages 24-35 months ($p = 0.000$) and 36-47 months ($p = 0.004$). However, in the 48-59 month group, there was no significant difference ($p = 0.103$).

Figure 1 illustrates that in the case group, the largest proportion of children aged 24-35 months received inadequate stimulation (76.31%), while among those aged 36-47

months and 48-59 months, 54.17% and 52% respectively received adequate stimulation. In the control group, the majority of children aged 24-35 months and 36-47 months received adequate stimulation (72.98% and 58.07%, respectively), whereas among those aged 48-59 months, the largest proportion received inadequate stimulation (52.64%).

Table-1. Distribution of Family Characteristics in Jember Regency (n = 174).

Variable	Case Group (n = 87)	Control Group (n = 87)	Total (n = 174)
Age (years)			
Md (P_{25}-P_{75})	30 (28-35)	30 (28-34)	30 (28-34)
M (SD)	30.87 (5.06)	30.70 (4.55)	30.79 (4.80)
Role in the family n (%)			
Mother	87 (100.00)	87 (100.00)	174 (100.00)
Education level n (%)			
No formal education	7 (8.05)	0 (0)	7 (4.02)
Elementary school/equivalent	29 (33.33)	0 (0)	29 (16.67)
Junior high school/equivalent	44 (50.57)	10 (11.49)	54 (31.03)
High school/equivalent	7 (8.05)	70 (80.46)	77 (44.26)
Diploma/Bachelor's degree	0 (0)	7 (8.05)	7 (4.02)
Occupation n (%)			
Unemployed	86 (98.85)	65 (74.71)	151 (86.79)
Laborer	1 (1.15)	2 (2.30)	3 (1.72)
Farmer	0 (0)	4 (4,56)	4 (2.29)
Self-employed	0 (0)	14 (16,10)	14 (8.05)
Civil Servant	0 (0)	2 (2,33)	2 (1.15)
Family income n (%)			
< Minimum Wage Rp. 2.838.642,00	87 (100.00)	18 (20.69)	105 (60.34)
≥ Minimum Wage Rp. 2.838.642,00	0 (0)	69 (79.31)	69 (39.66)
Number of children in family n (%)			
1	39 (44.83)	49 (56.32)	88 (50.58)
2	39 (44.83)	32 (36.78)	71 (40.80)
>2	9 (10.34)	6 (6.90)	15 (8.62)

Notes: n (%) : Frequency of participants (percentage); **Md :** Median; **P_{25}–P_{75} :** Percentiles 25–75; **M:** Mean; **SD :** Standard Deviation

Table-2. Distribution of Child Characteristics in Jember Regency (n = 174).

Variable	Case Group (n = 87)	Control Group (n = 87)	Total (n = 174)
Age (month)			
Md (P25-P75)	38 (31-48)	37 (31-47)	38 (31-48)
M (SD)	39.67 (10.19)	38.83 (9.34)	39.25 (9.75)
Gender n (%)			
Male	48 (55.17)	50 (57.47)	98 (56.32)
Female	39 (44.83)	37 (42.53)	76 (43.68)
Exclusive Breastfeeding history 6 months n (%)	48 (55.17)	66 (75.86)	114 (65.52)
Yes	39 (44.83)	21 (24.14)	60 (34.48)
No			
Immunization history n (%)			
Complete	87 (100.00)	87 (100.00)	174 (100.00)
Incomplete	0 (0)	0 (0)	0 (0)

Notes: n (%) : Frequency of participants (percentage); **Md:** Median; **P_{25}–P_{75} :** Percentiles 25–75; **M:** Mean; **SD:** Standard Deviation

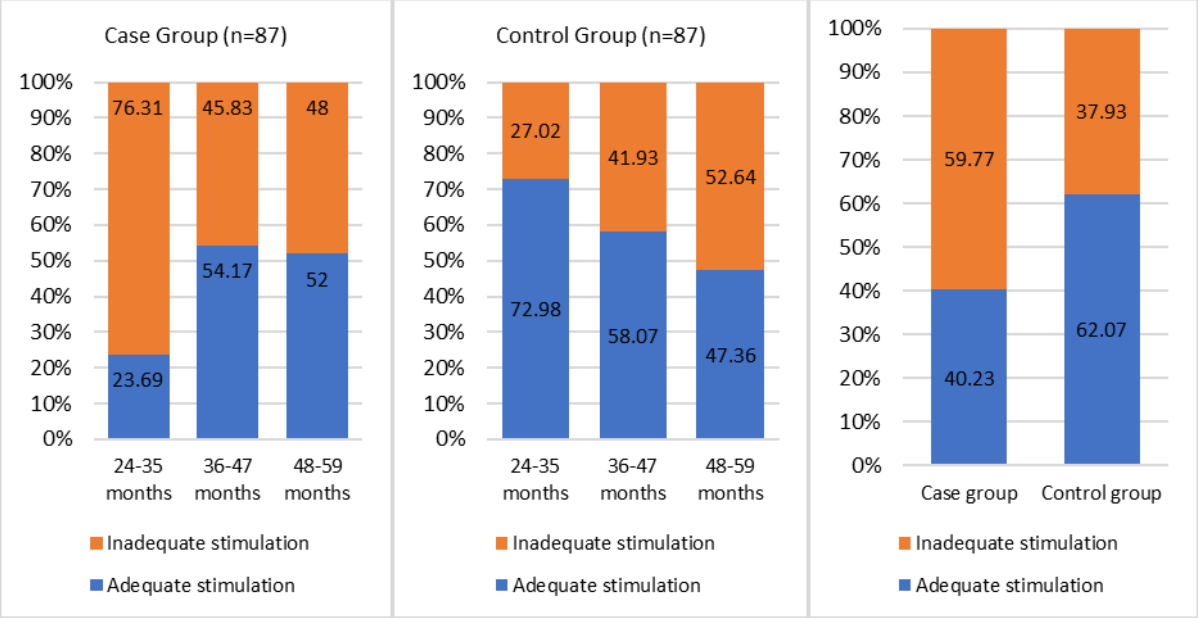

Figure-1: Family-Provided Child Development Stimulation by Age Category in the Case and Control Groups (n = 174).**Note:** (%) :Percentage of respondents

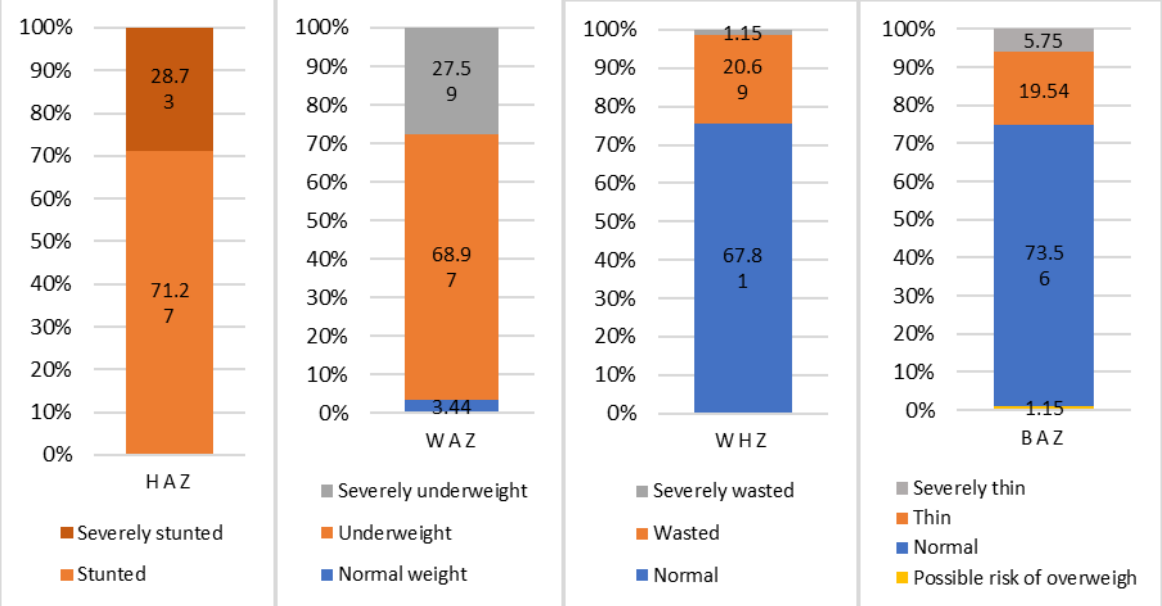

Figure-2: Distribution of Nutritional Status Based on HAZ, WAZ, WHZ, and BAZ Indicators in the Case Group (n = 87).**Note:** (%) : Percentage of respondents

Table 4 indicates that there were significant differences in children's height, weight, and nutritional status based on height-for-age z-score (HAZ), weight-for-age z-score (WAZ), weight-for-height z-score (WHZ), and BMI-for-age z-score (BAZ) indicators between the case and control groups, with all Mann-Whitney test $p = 0.000$.

Figure 2 reveals that in the case group, all children were categorized as stunted based on the HAZ indicator. For the WAZ indicator, most children were underweight (68.97%). The majority were in the normal category for the WHZ (67.81%) and BAZ (73.56%) indicators.

In Figure 3, all children in the control group were in the normal category based on HAZ (100%). For WAZ, most children were normal weight (94.25%). For WHZ, most were in the good nutrition category (91.95%), and for BAZ, the majority were normal (98.85%).

Table 5 reveals a significant relationship between family-provided growth and development stimulation and the incidence of stunting ($\chi 2 = 7.452$; $p = 0.006$). Children who received adequate stimulation had a 2.43 times greater chance of not experiencing stunting than those who received inadequate stimulation (OR = 2.43; 95% CI = 1.32-4.47).

Table-3. Distribution of the Significance Values of Family-Provided Child Development Stimulation in Jember Regency (n = 174).

Age (month)	Case Group (n = 87)				Control Group (n = 87)				Total (n = 174)			
	n	M (SD)	Z[a]	P-value [a]	n	M (SD)	Z[a]	P-value [a]	n	M (SD)	Z[b]	P-value [b]
Age 24-35	38	15.61 (7.72)	0.911	0.005	37	24.41 (6.48)	0.701	0.000	75	19.72 (8.48)	-4.982	0.000
Age 36-47	24	15.21 (6.19)	0.831	0.001	31	18.29 (5.04)	0.757	0.000	55	16.95 (5.73)	-2.916	0.004
Age 48-59	25	18.12 (6.04)	0.851	0.002	19	20.42 (5.27)	0.737	0.000	44	19.11 (5.77)	-1.632	0.103

Notes: n: Frequency of participants; **M:** Mean; **SD:** Standard Deviation; **Z[a]:** Calculated value of Kolmogorov-Smirnov Test; **P-value[a]:** Significant Kolmogorov-Smirnov Test; **Z[b]:** Calculated value of Mann-Whitney; **P-value[b] :** Significant Mann-Whitney

Table-4. Distribution of Nutritional Status of Children Aged 24–59 Months in Jember Regency (n = 174).

Variable	Case Group (n = 87)			Control Group (n = 87)			Total (n=174)
	Md (P_{25}-P_{75})	Z	P-value [a]	Md (P_{25}-P_{75})	Z	P-value [a]	P-value [b]
Height	87.25 (82.41-92.37)	0.083	0.199	97.81 (92.46-103.46)	0.077	0.200	< 0.001
Weight	10.43 (9.34-11.62)	0.045	0.200	14.90 (13.12-16.25)	0.061	0.200	< 0.001
Nutritional status							
Height-for-age z-score (HAZ)	-2.53 (-3.35- -2.29)	0.181	< 0.001	0.08 (-0.13-0.29)	0.152	< 0.001	< 0.001
Weight-for-age z-score (WAZ)	-2.61 (-3.22- -2.26)	0.159	< 0.001	0.06 (-0.23-0.29)	0.167	< 0.001	< 0.001
Weight-for-height z-score (WHZ)	-1.64 (-2.26- -1.19)	0.092	0.067	0.00 (-0.34-0.33)	0.301	< 0.001	< 0.001
BMI-for-age z-score (BAZ)	-1.39 (-2.03- -0.91)	0.093	0.062	-0.05 (-0.37-0.24)	0.127	< 0.001	< 0.001

Notes: n: Frequency of participants; **Md:** Median; **P_{25}-P_{75}:** Percentiles 25-75; **Z:** Calculated value of Kolmogorov-Smirnov Test; **P-value[a]:** Significant Kolmogorov-Smirnov Test; **P-value[b]:** Significant Mann-Whitney

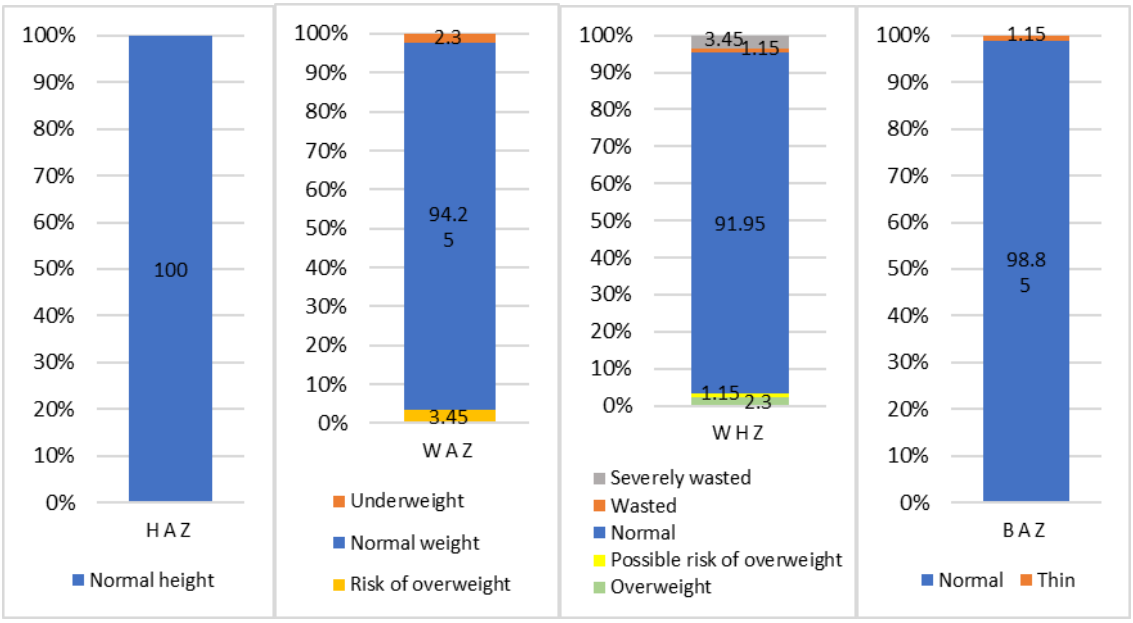

Figure-3: Distribution of Nutritional Status Based on HAZ, WAZ, WHZ, and BAZ Indicators in the Control Group (n = 87).**Note:** (%) : Percentage of respondents

Table-5. The Relationship Between Family-Provided Child Development Stimulation and Stunting in Children Aged 24–59 Months in Jember Regency (n = 174).

Family-Provided Growth and Development Stimulation	Children Stunting				χ^2	p-value	OR	95% CI
	Stunting		Not Stunting					
	n	%	n	%				
Adequate	35	40.23	54	62.07	7.452	0.006	2.431	1.322 - 4.471
Inadequate	52	59.77	33	37.93				

Notes: n (%): Frequency of participants (percentage); χ^2**:** Chi-square value; **p-value:** Chi-square significance; **OR:** Odds Ratio; 95% **CI:** 95 Confidence interval

4- DISCUSSION

This study found a significant relationship between family-provided growth and development stimulation and the incidence of stunting among participants. Children who received adequate stimulation had a 2.43 times greater likelihood of having normal height-for-age compared to those with inadequate stimulation. Differences in stimulation were most apparent in younger age groups, while no significant difference was observed in the oldest group.

4-1. Family-Provided Growth and Development Stimulation

For children aged 24–35 months, most in the stunting group received inadequate stimulation (76.31%), whereas the majority in the control group received adequate stimulation (72.98%). This difference was statistically significant (p = 0.000) and may be explained partly by disparities in maternal education; in the stunting group, 50.57% of mothers had completed junior high school and 8.05% had no formal education, compared to 80.46% with high school degrees and 8.05% with college degrees in the control group. Lower maternal education levels often limit the quality and variety of home stimulation, potentially delaying multiple aspects of child development (13). The

level of maternal education plays a critical role in determining parenting patterns, teaching approaches, and the ability to offer varied, age-appropriate stimulation (14–16). This difference is also reflected in the type of stimulation provided-families more often engaged in basic activities such as comfort, positive interaction, and meeting nutritional needs, while more cognitively demanding activities, such as storytelling or co-viewing screen media, were less common. Educational programs targeting mothers with lower education could help improve the quality and variety of stimulation provided.

When focusing on the 36–47 month subgroup, adequate stimulation was common in both groups but remained higher in the control group (58.07%) compared to the case group (43.69%), with the difference being statistically significant ($p = 0.004$). One contributing factor may have been maternal employment status; while most mothers in both groups were unemployed, the proportion was higher in the case group (98.85%) compared to the control group (74.71%). According to Friedman's theory, the family's educational role is essential for providing activities that support age-appropriate growth and development, a view supported by Nelson's findings on the importance of home-based stimulation for preschool-age children (17,18). In this subgroup, common stimulation activities include playing together, engaging in physical activities, giving simple commands, and fostering emotional bonds. Other research suggests that non-working mothers may provide more cognitive stimulation than working mothers, though both can create supportive home environments (19). Collectively, these observations reinforce the critical role of parents-especially mothers-in delivering consistent and varied stimulation, supporting the broader context of stunting prevention.

In participants aged 48-59 months, no significant association between stimulation and stunting was found ($p = 0.103$). This may be due to catch-up growth that often occurs in later childhood, combined with reduced parental involvement in direct stimulation at this age. In the case group, 52% of children received adequate stimulation, while in the control group, slightly more than half (52.64%) received inadequate stimulation. According to Friedman, family health care and affective functions are important for child development (17). Less-than-optimal functioning in these areas-particularly education and daily parenting-may reduce the quality of stimulation (20). In addition, quality caregiver-child interactions, including socio-emotional stimulation, can significantly reduce the risk of developmental delay, with success strongly influenced by a harmonious and loving family environment (21,22). In this study, the most common stimulation activities include emotional interaction, fostering good habits, and independence training, whereas less frequent activities related to growth monitoring, personal hygiene, and balanced nutrition. These findings suggest the need for comprehensive family support programs that emphasize both parenting quality and fulfillment of children's basic health needs, especially for families providing suboptimal age-appropriate stimulation.

4-2. Incidence of Stunting in Children

Based on the HAZ indicator, all children in the case group experienced linear growth disorders, while all in the control group had normal height. These findings indicate that nutritional status plays a vital role in preventing stunting, aligning with prior evidence ($p < 0.001$). Stunting is one of the chronic nutritional problems in children, characterized by lower height than age standards due to prolonged malnutrition, which is

influenced by various interrelated risk factors (23). One of the important factors influencing the incidence of stunting is the role of family and the environment in fulfilling children's basic needs, such as providing balanced nutrition and adequate social support (24). Families and environments that function optimally play an important role in preventing stunting through proper parenting, nutritional fulfillment, and access to basic health services (25). Therefore, the significant difference in linear growth status between the case and control groups reflects differences in nutritional status that need to be considered in efforts to prevent stunting early on.

Other nutritional indicators revealed that 68.97% of the case group were underweight according to WAZ, while 67.81% and 73.56% had good nutritional status based on WHZ and BAZ, respectively. In the control group, most children had better nutritional status, with 94.25% classified as normal weight based on WAZ, and 91.95% and 98.85% showing good nutritional status according to WHZ and BAZ, respectively. This data shows that the case group tends to have lower nutritional status, especially in the WAZ indicator, while the control group is dominated by children with good nutritional status in all indicators. Nutritional status is an important factor affecting children's growth and development, including the incidence of stunting (23). Underweight serves as an early indicator of growth disorders because it indicates low energy reserves and nutrients needed to support optimal linear growth (26). Therefore, differences in nutritional status between the two groups potentially contribute to the higher incidence of stunting in the case group.

Nutritional status based on the indicators of WAZ, WHZ, BAZ revealed significant differences between the case and control groups, with the Mann-Whitney test $p < 0.001$. This is reflected in the case group, where the proportion of underweight children is quite high, aligning with the high incidence of stunting. In contrast, the control group is dominated by children with good nutritional status and age-appropriate linear growth, with no cases of stunting. This finding indicates that nutritional status plays an important role in preventing growth disorders. In this context, the family as the child's closest environment has a crucial role in determining nutritional intake and overall health conditions (27). Family support is realized by providing varied and highly nutritious food, as well as regularly monitoring children's growth and development to maintain optimal nutritional status (28). Therefore, increasing family awareness and implementing preventive measures against risk factors for stunting need to be done early to prevent stunting and its long-term effects.

4-3. Relationship between Family-Provided Growth and Development Stimulation and the Incidence of Stunting in Children

The analysis showed a significant relationship between family-provided growth and development stimulation and stunting in children aged 24-59 months in Jember Regency ($\chi^2 = 7.452$; p-value = 0.006). This aligns with WHO's Conceptual Framework of Stunted Growth and Development, which identifies inadequate family care, including inadequate child stimulation and activity, as a cause of stunting (7). Supporting studies indicate that parental stimulation plays a key role in the growth and development of stunted children, alongside necessary nutritional interventions (29). Another study finds that adequate stimulation from parents has a highly significant relationship with optimal nutritional status, with an odds ratio of 5.90, emphasizing that family stimulation

is a determining factor in preventing stunting (30). The results underline the importance of increasing parents'capacity, particularly in providing appropriate growth and development stimulation according to the child's age, as part of a holistic approach to reducing the incidence of stunting. Therefore, family-based interventions that focus on enhancing parents' understanding and skills in delivering appropriate and consistent stimulation can serve as an important effort in stunting prevention.

The odds ratio of 2.43 indicated that participants with adequate stimulation had 2.43 times greater chance of not experiencing stunting than those who receive inadequate stimulation. The results showed that 62.07% of children who received adequate stimulation were not stunted. This indicates that family-provided appropriate stimulation plays a role in supporting children's nutritional status. Proper stimulation from an early age, through play, social interaction, and family involvement, plays an important role in optimizing brain development and child growth, while lack of stimulation can inhibit brain function (31). In addition, purposeful and consistent stimulation from mothers contributes to creating a positive mood and increasing a child's appetite, which ultimately results in meeting nutritional needs and optimal growth (32). Children who receive regular stimulation tend to show better development compared to those who receive inadequate stimulation (33). Therefore, providing adequate stimulation from an early age needs to be one of the components in a family-based stunting prevention strategy.

These findings suggest the need for comprehensive family support programs that emphasize both parenting quality and fulfillment of children's basic health needs, especially for families providing suboptimal age-appropriate stimulation. Although this study was conducted in Jember Regency, the findings may be applicable to other regions in Indonesia with similar socioeconomic and cultural characteristics. However, differences in local contexts, health service accessibility, and parenting practices should be considered when generalizing these results.

This study has several limitations. The family and child characteristics questionnaire does not capture all relevant factors, such as access to healthcare services. The stimulation assessment instrument uses only "Yes" and "No" responses, limiting information on the quality and frequency of stimulation. In addition, a small portion of anthropometric data (height and weight) is obtained from Maternal and Child Health Book records rather than direct measurement.

5- CONCLUSION

This study found that the majority of participants in the stunting group (59.77%) did not receive adequate growth and development stimulation, while most participants in the control group (62.07%) did receive adequate stimulation. Stunted children were classified as very short (28.73%) or short (71.27%), whereas all children in the control group had normal height. Adequate stimulation was significantly associated with a lower risk of stunting ($\chi^2 = 7.45$; $p = 0.006$; OR = 2.43; 95% CI = 1.322–4.471). The lack of a significant difference in stimulation among the 48–59 month subgroup could be due to developmental catch-up, reduced parental involvement, or other influencing factors, indicating the need for further investigation.

6- REFERENCES

1. UNICEF, WHO, World Bank Group. Levels and trends in child malnutrition: UNICEF/WHO/World Bank Group joint child malnutrition estimates: key findings

of the 2023 edition. Geneva: World Health Organization; 2023.

2. Kemenkes RI. Factsheets: Stunting di Indonesia dan Determinannya. Kemenkes BKPK. 2023.

3. Munira SL. Hasil Survei Status Gizi Indonesia (SSGI) 2022.

4. Kemenkes BKPK. Survei Kesehatan Indonesia (SKI) 2023 dalam Angka. Kementerian Kesehatan Badan Kebijakan Pembangunan Kesehatan.2023.

5. Laily LA, Indarjo S. Literature review: Dampak stunting terhadap pertumbuhan dan perkembangan anak. HIGEIA (Journal of Public Health Research and Development). 2023 Jul 18;7(3):354-64.

6. Kemenkes RI. Peraturan Menteri Kesehatan Republik Indonesia Nomor 2 Tahun 2020 Tentang Standar Antropometri Anak. Jakarta: Menteri kesehatan republik indonesia. 2020.

7. World Health Organization. Stunted growth and development: context, causes and consequences. Geneva: World Health Organization. Retrieved March. 2017;24:2020.

8. Fatmawati A, Mujiadi M, Prastya A. Telenursing's Effectiveness on Mothers's Ability to Stimulate Child Development. Jurnal Pendidlkan Keperawatan Indonesia; 8(2):135-42.

9. Sukmawati FS. Family empowerment through psychosocial stimulation assistance and child feeding in increasing nutrition intake and body weight of children 2-3 years old to prevent stunting. Indian Journal of Forensic Medicine & Toxicology. 2021 Jul;15(3):4339.

10. Kemenkes RI KR. Pedoman umum: Program Indonesia sehat dengan pendekatan keluarga; 2016.

11. Yani DI, Rahayuwati L, Sari CW, Komariah M, Fauziah SR. Family household characteristics and stunting: an update scoping review. Nutrients. 2023 Jan 2;15(1):233.

12. Mansur H, Setyaningsih W. Analysis of parents' factors in providing developmental stimulation among pre-school age children in Pakis Sub-District, Malang, East Java. Public Health and Preventive Medicine Archive. 2021;9(1).

13. Do H, McCoy DC. The relations between caregiver education, home stimulation, and Children's developmental outcomes: research in majority world countries. International Journal of Early Childhood. 2025 Apr;57(1):295-318.

14. Cuartas J, McCoy D, Sánchez J, Behrman J, Cappa C, Donati G, et al. Family play, reading, and other stimulation and early childhood development in five low-and-middle-income countries. Developmental science. 2023 Nov;26(6):e13404.

15. David BE, Kumar S. Child development beyond the nutrition-specific models: bridging the pathways via psychosocial stimulation. Frontiers in Psychology. 2023 Nov 23;14:1273591.

16. Febrianti T, Hawara G. Hubungan Tingkat Pendidikan Ibu dengan Penerapan Stimulasi Perkembangan pada Anak Usia Prasekolah. Jurnal Keperawatan Raflesia. 2024 May 30;6(1):45-56.

17. Friedman MM, Bowden VR, Jones EG. Buku ajar keperawatan keluarga: Riset, teori, dan praktek. Jakarta: Egc. 2010;5.

18. Sivaraman V, Fels EC, Ardoin SP, Kliegman RM, St Geme JW, Blum NJ, Shah SS, Tasker RC, Wilson KM. Nelson Textbook of Pediatrics, 2020.

19. Sulaiman S, Hasnawi H, Suardi S. Early childhood cognitive stimulation from working and non-working mothers. Cakrawala Pendidikan Jurnal Ilmiah Pendidikan. 2023;42(1):164-75.

20. Urke HB, Contreras M, Matanda DJ. The influence of maternal and household resources, and parental psychosocial child stimulation on early childhood development: A cross-sectional study of children 36–59 months in Honduras. International journal of environmental research and public health. 2018 May;15(5):926.

21. Chang R, Li C, Wei M, Jiang Y, Zhang J. Roles of caregiver-child interaction on the association of socioeconomic status with early childhood development: a population-based study in rural China. BMC Public Health. 2024 Jun 17;24(1):1604.

22. Dewi RK, Sumarni S. Parenting style and family empowerment for children's growth and development: A systematic review. Journal of Public Health in Africa. 2023 May 25;14(2):8.

23. McGuire S, World Health Organization. Comprehensive implementation plan on maternal, infant, and young child nutrition. Geneva, Switzerland. 2014:134-5.

24. Haris S, Nuraeni A. Keperawatan Keluarga: Pendekatan Komprehensif Dalam Perawatan Kesehatan Keluarga. Padang: Get Press Indonesia. 2023.

25. Bella FD, Fajar NA, Misnaniarti M. Hubungan antara pola asuh keluarga dengan kejadian balita stunting pada keluarga miskin di Palembang. Jurnal Epidemiologi Kesehatan Komunitas. 2020 Feb 27;5(1):15-22.

26. Jalaludin MY, Fauzi MD, Sidiartha IG, John C, Aviella S, Novery E, et al. Addressing Stunting in Children Under Five: Insights and Opportunities from Nepal, Bangladesh, and Vietnam—A Review of Literature. Children. 2025 May 16;12(5):641.

27. Hossain SJ, Rahman SM, Fisher J, Rahman A, Tofail F, Hamadani JD. Effect of a parenting and nutrition education programme on development and growth of children using a social safety-net platform in urban Bangladesh: a cluster randomized controlled trial. The Lancet Regional Health-Southeast Asia. 2024 Jun 1;25.

28. Susanto T, Rasni H, Susumaningrum LA. Perawatan keluarga dalam pemenuhan kebutuhan nutrisi balita: aplikasi keperawatan keluarga dalam konteks agronursing. Jakarta: Trans Info Media; 2022. xiv, 190 p.

29. Rizki F, Dhamayanti M, Widiyanti R. The role of parental stimulation in the development of stunted toddlers. Proceedings Optimal. 2025 Jun 30.

30. Sari YW, Khomsan A, Roosita K. The role of stimulation, affection, and parenting patterns in stunting among children aged 24-59 months. AcTion: Aceh Nutrition Journal. 2025 Mar 15;10(1):146-55.

31. Wardani AE, Wijayanti LA, Mediawati M. Hubungan stimulasi tumbuh kembang oleh orang tua dengan perkembangan bicara dan Bahasa balita usia 29-59 bulan di kelompok bermain lentera bangsa kota kediri. Judika (Jurnal Nusantara Medika). 2022 Oct 25;6(2):80-94.

32. Ilyka D, Johnson MH, Lloyd-Fox S. Infant social interactions and brain development: A systematic review. Neuroscience & Biobehavioral Reviews. 2021 Nov 1;130:448-69.

33. Mareta R, Sulaeman ES, Setyowati R, Padmaningrum D. The Role of Parents in Child Development: Literature Review. In5th Borobudur International Symposium on Humanities and Social Science 2023 2024 Aug 2 (pp. 1101-1108). Atlantis Press.