

# Good parental feeding style reduces the risk of stunting among under-five children in Yogyakarta, Indonesia



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## ABSTRACT

**Background and purpose:** In Indonesia, many studies on the causes of stunting in children have been conducted. However, still few have explored the parental feeding style in relation to stunting. The purpose of this study was to analyze the relationship between parental feeding style and stunting among under-five children in Kulon Progo District, Yogyakarta.

**Methods:** This study used a cross sectional design. This study involved 729 respondents who were the entire population of under-five children in Kulon Progo. Mothers were interviewed about the socio-demographic, economic and parental feeding style that mothers gave to their children using a structured questionnaire. Data were analyzed descriptively to identify the frequency distribution of each variable, hypothesis testing with chi square test and multivariable analysis with logistic regression at a significance level of 5% were performed.

**Results:** Of the 729 under-five children analyzed, 37.6% were found to be stunting. The proportion of poor parental feeding style was almost 50%. The finding of this study showed that mother's occupation (AOR=2.13; 95%CI: 1.26-3.59), family income (AOR=3.56; 95%CI: 2.34-5.42) and parental feeding style (AOR=2.77; 95%CI: 1.97-3.91) have a significant relationship with stunting.

**Conclusion:** The prevalence of stunting is quite high in the study area. Parents with poor parental feeding style are predicted to increase the risk of stunting among under-five children. Family-based interventions that involve parenting styles in child feeding practices should be considered in reducing stunting among children.

**Keywords:** family income, mother's occupation, parenting feeding style, stunting, under-five children.

**Cite this Article:** Gustina, E., Sofiana, L., Ayu, S.M., Wardani, Y., Lasari, D.I. 2020. Good parental feeding style reduces the risk of stunting among under-five children in Yogyakarta, Indonesia. *Public Health and Preventive Medicine Archive* 8(2): 120-125. DOI: [10.15562/phpma.v8i2.306](https://doi.org/10.15562/phpma.v8i2.306)

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## INTRODUCTION

Stunting is a chronic malnutrition problem caused by lack of nutritional intake for a long time, causing growth problems in children where the child's height is shorter than the standard age. Stunting is considered a public health problem when the prevalence of stunting is above 20%.<sup>1</sup> The prevalence of stunting varies between countries. Prevalence of stunting in Tanzania was 35.5%<sup>2</sup>, in Nepal 26.3%<sup>3</sup>, in Northwest Ethiopia 49.9%<sup>4</sup>, in Rwanda 38%<sup>5</sup> and in Indonesia was 30.8% in 2018.<sup>6</sup> Meanwhile, the WHO target by 2025 is to reduce the prevalence of stunting in children under five by 40%.<sup>7</sup>

Stunting is associated with developmental domains<sup>8</sup> namely lower psycho-motoric development experienced by the children<sup>9,10</sup>, poor cognitive development in children<sup>11,12</sup> 55% of children <5 y were anemic and 40% stunted in 2010. Currently, no data exists on the nutritional status of Cambodian school-aged children, or on how malnutrition potentially affects their cognitive development. Objective: To assess the

anthropometric and micronutrient status (iron, vitamin A, zinc, iodine but did not affect social maturity in children.<sup>13</sup> Stunting is associated with pneumonia in which stunting children have a higher risk of experiencing longer recovery.<sup>14</sup>

Stunting is caused by multi-factors. Good parental education is associated with better child growth. Parental education, household wealth index, length of breastfeeding, sex of child, low birth weight, lack of access to health services including sub-optimal antenatal care, delivery not in health care facilities (home delivery), lack of sanitation and low maternal knowledge regarding child nutrition are predictors for stunting in children.<sup>3,15-18</sup> Stunting is also associated with the practice of parent feeding, where parent-to-child feeding determines the child's eating behavior and weight gain.<sup>19</sup>

Several studies on child feeding practices have been carried out, but the focus of previous researchers was on child feeding practices related to children's nutritional status<sup>20-22</sup>, obesity<sup>23</sup>, the pressure to eat with stunting<sup>24</sup>, and parenting with

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stunting.<sup>25</sup> The focus of our study is different from previous studies, we explore relationship between parental feeding styles and stunting in children. We included independent variables such as family income, mother's employment status and parental feeding styles. The finding from this study will help policymakers developing stunting prevention intervention by accommodating parenting styles in their children's feeding practices. Therefore, the purpose of this research was to identify the relationship between parental feeding style and stunting in under-five years in Kulon Progo District, Yogyakarta, Indonesia.

## METHODS

This research was conducted using a cross-sectional design from May to July 2019 to determine association between parental feeding styles with stunting in under-five children. The research population is under-five children in five sub-districts in Kulon Progo District which consists of 9 villages. Five sub-districts in 2017 rank 43 out of 100 districts which need further intervention related to stunting cases. A total population sampling technique ( $n=729$ ) was applied. The mother was interviewed about socio-demographic, economic and parental feeding style that the mother gives to her child with a structured questionnaire that has been tested previously.

Data collected by enumerators are primary data obtained through a questionnaire modified from the Child Feeding Questionnaire (CFQ)<sup>26</sup> and Parental Feeding Style Questionnaire (PFSQ).<sup>27</sup> We use the four scales in Parental Feeding Style Questionnaire: emotional feeding where the behavior or way parents provide food to children in response to feelings (e.g. I give my son something to eat so he will feel better when he worries); encouragement to eat is the way parents give in encouraging children to eat (e.g. I serve food in an interesting way for my child to eat); control over eating is the mother determines what foods to eat and when the child should eat; (4) instrumental feeding the way parents reward children by providing food if they exhibit the behavior the parents command (e.g. I gift my child with something to eat when he is well-behaved). We categorize the parental feeding style into two category: good parental feeding style if the total score is  $\geq 45$ ; parental feeding style is not good if the total score is  $< 45$ .

Meanwhile, secondary data was obtained from data on the number of children under five and the nutritional status of under-five children in the Kulon Progo District Health Office in 2018. The modification of questionnaire was carried out

before the validity test with  $r > 0.3$  and Cronbach alpha value 0.68. Data were analyzed descriptively to identify the frequency distribution of each research variable. Hypotheses testing using the Chi Square Test and multivariable analysis with multiple logistic regression were performed to produce the adjusted odds ratio (AOR). Hypotheses were tested at a 5% significance level and a 95% level of confidence.

This research has received an ethical clearance from the Universitas Ahmad Dahlan Ethics Committee with number 011903012 in 2019. Informed consents were given to respondents to ensure that respondents voluntarily participated in this research.

## RESULTS

Of the 729 under-five children involved in the study, more than half (53.77%) were male. Children's age also varies in each category. The majority (70.29%) of the mothers in this study were in the age range of 20-35 years. Meanwhile, two third of parents' education was at a high school level (67.35% for mother's and 61.04% for father's education), and most of the mothers were not working (82.17%). Family income mostly fell in the low category (69.14%) (Table 1). In this study, the prevalence of stunting was 37.6%. The proportion of poor parental feeding style was almost as high as 50% (Table 2).

Based on parental feeding style, proportion of stunting in children with poor parental feeding style (51%) was twice higher than those with good parental feeding style (25.26%). There is not much difference on the proportion based on sex, while based on age group, the proportion of stunting among older age groups was higher than younger age groups.

The bivariate analysis with chi square test shows that stunting is related to mother's occupation, family income, parent's education, mother's age and parental feeding style (Table 4). The multivariate analysis was used to determine predictors of stunting. The results of the analysis presented in Table 5 show that stunting among children under five is higher in mothers who were not working and from high risk age group ( $< 20$  years and  $> 35$  years), also if the fathers have low education and the family from low income group. Parental feeding style (AOR=2.77; 95%CI: 1.97-3.91) has a relationship with stunting, where children whose parents have poor parental feeding style are 2.89 times more likely to experience stunting compared to parents who have good parental feeding style.

**Table 1. Socio-demographic characteristics of children and parents (n=729)**

Characteristics	n	%
Sex of child		
Male	392	53.77
Female	337	46.23
Age of child (months)		
0-12	107	14.68
13-24	150	20.58
25-36	180	24.69
37-48	175	24.01
49-59	117	16.05
Mother's age (years)		
<20	2	0.27
20-35	517	70.92
>35	210	28.81
Mother's education		
Elementary school	41	5.62
Middle school	154	21.12
High school	491	67.35
Higher education	43	5.90
Father's education		
Elementary school	81	11.11
Middle school	165	22.63
High school	445	61.04
Higher education	38	5.21
Mother's occupation		
Not working	599	82.17
Working	130	17.83
Family income		
Low	504	69.14
High	225	30.86
<b>Total</b>	<b>729</b>	<b>100.0</b>

**Table 2. Frequency distribution of stunting and parental feeding style**

Characteristics	n	%
Stunting		
Yes	274	37.59
No	455	62.41
Parental feeding style		
Poor	349	47.87
Good	380	52.13
<b>Total</b>	<b>729</b>	<b>100.0</b>

## DISCUSSION

The prevalence of stunting in this population is 37.6%. The prevalence of stunting in this study is above the national level of 30.8%.<sup>6</sup> We found maternal occupation, mothers' age, family income,

father's education and parental feeding style were associated with stunting.

Socioeconomic status is usually reflected from education, income and work position at the individual level. Socioeconomic status has an impact on children's nutrition.<sup>28</sup> In this study, the majority of maternal education is high school, most of them were not working and family income is in the low income category. Mothers with low levels of education increased the risk of stunting. Children of mothers with no education or with only elementary education had a 77% increase in risk of stunting compared with children of mothers with tertiary education.<sup>29</sup> Mothers who are not working may result in low-income households. The possible impact is lack of nutrition for children to achieve optimal growth. Unmet need for physical development in children can result in stunted growth.<sup>4</sup>

Mothers aged between 20-35 years, consider as low risk age group for having a baby, were associated with lower odds of stunting which may related to education, family income and better preparedness on nurturing a child. Maternal age is an important predictor of stunting. Children of adult mothers were less likely to be stunted than children of teenage mothers and older mothers.<sup>30</sup> Children of teenage mothers were 8 times more likely to be stunted than adult mothers. Adolescent mothers are less able to ensure adequate food intake for their children due to household food insecurity, inappropriate parenting practices compared to adult mothers which can affect the growth and development of children resulting in malnutrition.<sup>31</sup>

Meanwhile, father's education and family income were also associated with stunting, where father's education is likely correlated with better occupation which lead to better income. Children who have fathers with postsecondary education are less likely to be stunted.<sup>32</sup> Parents who completed higher formal education will reduce the risk of their children becoming stunted.<sup>33</sup> The results of the study indicate that high parental education has a correlation with household wealth.<sup>34</sup> Children with poor families are more likely to be stunted than children with rich families.<sup>35</sup>

Stunting is more common in children who live in low-income households, or where mothers have low education.<sup>36</sup> Children living in the poorest households are almost five times more likely to be stunted than children from the richest households.<sup>37</sup> The socioeconomic status of parents greatly influences nutritional status, where household asset-based income shows an effect on nutritional status. Low socioeconomic status indicates poor nutritional status, and high socioeconomic status

**Table 3.** Frequency distribution of stunting based on parental feeding style, sex and age of child

Variables	Stunting			
	Yes		No	
	n	%	n	%
<b>Parental feeding styles</b>				
Poor	178	51.00	171	49.00
Good	96	25.26	284	74.74
<b>Sex of child</b>				
Male	154	39.29	238	60.71
Female	120	35.61	217	64.39
<b>Age of child (months)</b>				
0-12	22	20.56	85	79.44
13-24	41	27.33	109	72.67
25-36	89	49.44	91	50.56
37-48	75	42.86	100	57.14
49-59	47	40.17	70	59.41
<b>Total</b>	<b>274</b>	<b>37.59</b>	<b>455</b>	<b>62.41</b>

**Table 4.** Crude OR of stunting based on several factors

Variables	Stunting		Total	p	OR 95%CI
	Yes	No			
	%	%			
<b>Mother's occupation</b>					
Not working	41.90	58.10	130	<0.001	2.37 (1.62-3.47)
Working	17.69	82.31	599		
<b>Family income</b>					
Low	46.23	53.77	504	<0.001	2.54 (1.89-3.39)
High	18.22	81.78	225		
<b>Mother's education</b>					
Low	30.26	69.75	195	0.014	1.33 (1.05-1.69)
High	40.26	59.74	534		
<b>Father's education</b>					
Low	21.54	78.46	246	<0.001	2.12 (1.64-2.75)
High	45.76	54.24	483		
<b>Mother's age (Years)</b>					
20-35	31.91	60.89	517	<0.001	0.62 (0.52-0.74)
<20 or >35	51.42	48.58	212		
<b>Parental feeding style</b>					
Poor	51.00	49.00	349	<0.001	2.02 (1.65-2.47)
Good	25.26	74.74	380		
<b>Total</b>	<b>37.59</b>	<b>62.41</b>	<b>729</b>		

indicates good nutritional status.<sup>25</sup> Families with high household wealth tend to have better food security in their families so that their children get better food quantitatively and qualitatively.<sup>38</sup>

This study shows that stunting in under-five children occurs in parents with poor parental feeding style. The practice of feeding children is predicted to be the cause of stunting.<sup>39-42</sup> Parents with low knowledge about eating restriction and feeding

pressure are thought to play a role as predictors of stunting. Eating pressure includes how parents determine how much food is sufficient for their children.<sup>24</sup> Lack of parental awareness contributes to poor behavior in child feeding practices.<sup>43</sup> Low parental knowledge about nutrition was found to be associated with low cognitive performance of children as well.<sup>44</sup>

Parents who involve good parenting styles in feeding practices have the opportunity to have children with good eating behavior. Parents who exercise restrictions and pressure on eating in children are associated with the authoritarian parenting style adopted by the parents. Parents who are able to apply authoritative parenting to feeding practices are able to increase their children's appetite.<sup>45</sup> Mothers with authoritative feeding practices are able to improve the health of their children compared to authoritarian and permissive parenting styles.<sup>46,47</sup>

The parenting style in providing food<sup>46</sup> and the quality of care provided by parents<sup>48</sup> should be of more concern to achieve health in children. Community-based counseling and support for infant and child feeding must be provided to parents so that they are able to provide appropriate feeding practices for children. Interventions to reduce stunting need to be conducted by strengthening messages about child feeding by involving parenting styles in child feeding practices so as to increase positive responsive eating behavior.<sup>47,49</sup>

## CONCLUSION

The prevalence of stunting was quite high in the study area. Poor parental feeding style in this study was practiced by almost 50% of parents. Parents with poor parental feeding style showed an increase risk of stunting in under-five children. Therefore, there is a need to introduce family-based interventions in the practice of feeding children by involving parenting styles in reducing stunting problems.

## ACKNOWLEDGMENT

Researchers would like to thank the Institute of Research and Community Service Universitas Ahmad Dahlan and people of Kulon Progo District who have participated in this research.

## AUTHOR CONTRIBUTION

EG designed the study, analyzed the data, wrote the manuscript and edited the manuscript. LS, SMA, YW were involved in research design, supported the data analysis and edited the manuscript, DIL collected the data.

**Table 5. AOR of stunting among under-five children based on several factors**

Variables	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
<b>Mother's occupation</b>		
Not working	1	1
Working	2.37 (1.62-3.47)***	2.13 (1.26-3.59)**
<b>Family income</b>		
Low	1	1
High	2.54 (1.89- 3.39)***	3.56 (2.34-5.42)***
<b>Mother's education</b>		
Low	1	1
High	1.33 (1.05-1.69)**	1.14 (0.74-1.75)
<b>Father's education</b>		
Low	1	1
High	2.12 (1.64-2.74)***	3.43 (2.26-5.22)***
<b>Mother's age (Years)</b>		
20-35	1	1
<20 or >35	0.62 (0.52-0.74)	0.56 (0.37-0.81)
<b>Parental feeding style</b>		
Poor	1	1
Good	2.02 (1.65-2.47)***	2.77 (1.97-3.91)***

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; Pseud R<sup>2</sup>=0.18; CI=Confidence Interval; Level of Significance at p<0.05

## CONFLICT OF INTEREST

There is no conflict of interest declared by author

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