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Role of mothers during the golden period for stunting prevention: Nutrition fulfilment for toddlers in rural areas

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Abstract

Stunting is a serious global health problem for toddlers. It is determined based on the child's nutritional status and the mother's role determine their child's nutrition fulfilment. Their role lasts during pregnancy, breastfeeding, complementary feeding, and participation in nutrition-based health services. This study aims to determine the role of mothers during their child's golden period for stunting prevention, especially regarding fulfilment nutrition for toddlers in rural areas. This is a quantitative study that involved data collection among mothers with toddlers. Three rural sub-districts in Kulon Progo were involved: Lendah, Kalibawang, and Kokap. The samples in this study were 512 respondents. The total sampling technique was used, and data were collected from August to September 2022. Questionnaires about nutrition fulfilment for toddlers were spread via Google Forms. Data analyses using the Chi-squared test were performed by SPSS version 25.0. Family objections to the provision of animal protein ($p = 0.040$) and toddler's meal schedules ($p = 0.001$) have a significant relationship with the nutritional status of toddlers. Meanwhile, other factors had no significant relationship with the nutritional status of toddlers ($p > 0.05$). Mothers in rural area must be concerned about providing animal protein and feeding schedules for their children to contribute stunting prevention. The government must increase the responsiveness of the mother's role in supporting stunting prevention through providing toddler nutrition in the golden period

Keywords: Golden period, Nutrition fulfilment, Role of mothers, Stunting, Toddlers

Introduction

Stunting is considered a serious health problem.[1] Globally, 21.3% of toddlers, or around 144 million children, experience stunting.[2] In developing countries, the prevalence of stunting has decreased from 39.7% in 1990 to 21.8% in 2020.[3,4] However, the prevalence of stunting in Indonesia has experienced unstable changes. In 2010, the survey found that 35.6% of stunting occurred in toddlers, but in 2013 it increased to 37.2%. In 2018, a survey found that the prevalence of stunting was 29.9%, which decreased to 27.67% in 2019.[5] Yogyakarta's stunting prevalence was 10.69% in 2019. At the district level, Kulonprogo has a stunting prevalence of 12.7% of 20,918 toddlers. The Kulonprogo district has the second highest prevalence of stunting after the Gunung Kidul Regency in Yogyakarta.[6,35] Stunting reduction is the first goal of the Global Nutrition Targets for 2025 and a key indicator of Sustainable Development Goals.[7,36]

Stunting is associated with reduced motoric and physical development, lower academic performance, and poor economic ability.[1,8] Another impact is health problems, such as diarrhea and pneumonia.[1,9] Risk factors for stunting include poor maternal health, lack of antenatal care facilities, and insufficient feeding.[10] Stunting is determined based on the nutritional status of toddlers. A study found a significant relationship between nutrition fulfilment and status of toddlers.[11] A child's fulfilment of nutrition in the first 1000 days of life is determined by the role of mothers.[12] The first six months of life consist of breastfeeding and complementary feeding.[12,13,33]

The golden period is critical in a child's development.[14] It is a unique period of opportunity

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when the foundations of optimum health, growth, and neurodevelopment across the lifespan are established.[14,15] One way to optimize the golden period process is to provide balanced nutrition for toddlers. As the brain requires various nutrients for growth, certain nutrients, including protein, polyunsaturated fatty acids, iron, zinc, copper iodine, choline, folate, and vitamins A, B6, and B12, are particularly critical for a child's development.[16] Therefore, the role of mothers in fulfilling their toddler's nutrition during the golden period is essential. Moreover, two studies conducted in East Java and Manado, Indonesia, showed that mothers conduct 50% of all toddlers' parenting activities, and 40% are cared for jointly by both parents. This suggests that mothers have a dominant role in toddlers' growth and development phases.[17]

Various stunting prevention strategies administered from the prenatal and postnatal phases have been shown to positively impact their children's nutrition.[18] Thus, the role of the mother in the prenatal phase is essential to prevent stunting. Maternal nutrition plays a key role in the growth and development of the fetus.[19,34] Meanwhile, the role of the mother in toddlerhood includes the initiation of early breastfeeding, exclusive breastfeeding, and providing complementary foods.[13,20,32] This role is essential because improper feeding of toddlers is one of the causes of stunting.[1,20] Therefore, this study aims to determine the role of the mother during the golden period for stunting prevention, especially regarding nutrition fulfilment for toddlers in rural areas and the Kulon Progo District as our piloting sample.

Methods

This quantitative research used descriptive statistics. Mothers with toddlers in three sub-districts: Lendah, Kokap, and Kalibawang, Kulon Progo, were involved in this study. 3 research places included Lendah, Kalibawang, and Kokap with balanced proportion of the sample size. Lendah (33%), Kalibawang (35%), and Kokap (32%). Data collection was performed from August to September 2022. The researchers used the total sampling method as the data collection technique for this study. The number of samples used was 512 mothers with toddlers. The inclusion criteria for this study were mothers of toddlers in the three sub-districts mentioned above. The exclusion criteria for this study were mothers with toddlers in the three sub-districts who refused to be respondents. The role of the mother was assessed based on the toddler's nutrition fulfilment. The researchers collected data by distributing a questionnaire containing the perspective of nutrition fulfilment for toddlers and the mother's participation in nutrition-based health services. A questionnaire validity test was conducted on 110 respondents in the Kulonprogo District. The respondents in this study gave their informed consent before data collection. The researcher provided written informed consent form before filling out the online questionnaire. Filling informed consent was facilitated by local cadres. Nutritional status is assessed based on the results of weight and height checks for the last 1 month by cadres.The analysis of this study used the Chi-squared test with SPSS version 25.0. This analysis aims to determine the role of mothers during their toddler's golden period for stunting prevention, especially regarding nutrition fulfilment in rural areas.

Studies involving human respondents have been reviewed and approved by Yogyakarta Muhammadiyah University No. 001/EC-KEPK FKIK UMY/IX/2022.

Results

Table 1. Toddlers' characteristics

Characteristics	Frequency (n = 512)	Percentage (%)
Toddler's gender		
Male	266	52.0
Female	246	48.0
Toddler's age		
Baduta* age (0 - 24 months)	23	4.49
Batita* age (24 - 36 months)	88	17.2
Preschool age (36 – 60 months)	401	78.3

**Baduta: bawah dua tahun* (toddlers under two years of age); *Batita bawah tiga tahun* (toddlers under three years of age)

A total of 512 mothers with toddlers were involved in this study. Generally, the percentage of males and females is almost equal, with 52% (266) being male toddlers and 48% (246) being female toddlers. The average age of toddlers is classified as preschool age

(401 or 78.3%), and the least percentage of toddlers is classified as *baduta* age (23 or 4.49%) (Table 1).

Table 2. Characteristics of nutrition fulfilment in toddlers

Characteristics	Frequency (n = 512)	Percentage (%)
Exclusive breastfeeding		
Yes	410	80.1
No	102	19.9
Age of introducing complementary feeding		
<6 months	37	7.2
6 months	381	74.4
>6 months	94	18.4
Procurement of complementary feeding		
Buying	63	12.3
Cooking	449	87.7
Age of introducing animal protein		
6 – 12 months	512	100
>12 months	0	0
Rejection of animal protein		
Yes	16	3.1
No	496	96.9
Family objection to the provision of animal protein		
Yes	29	5.7
No	483	94.3
Age when introducing steamed rice		
7-9 months	342	66.7
10 – 12 months	170	33.3
Child's meal schedule		
Regular	435	85.0
Irregular	77	15.0
Child's meal frequency		
2 times	23	4.5
3 times	433	84.6
>3 times	56	10.9
Child's snack frequency		
1 time	19	3.7
2 times	231	45.1
3 times	116	22.7
>3 times	146	28.5
Food allergies		
Yes	35	6.8
No	477	93.2
Food restrictions		
Yes	97	18.9
No	415	81.1

Most toddlers had exclusive breastfeeding for six months (410 or 80.1%), followed by complementary feeding (381 or 74.4%). Only a small proportion of mothers provided complementary feeding before six months old (37 or 7.2%). Most mothers provided homemade food for their toddlers (449 or 87.7%). All mothers (512 or 100%) provided animal protein in the diet of toddlers aged 6 - 12 months, and only a few toddlers refused to eat animal protein (16 or 3.1%). Most toddlers could receive animal protein intake (496 or 96.9%). Moreover, most families did not object to providing animal protein to their toddlers (483 or 94.3%).

Furthermore, the average toddler has a regular eating schedule (435 or 85%) with a frequency of eating three times a day (433 or 84.6%). Most of the meals were given two times a day (231 or 45.1%). Only a small proportion of toddlers have specific food allergies (35 or 6.8%). Additionally, on average, the sampled toddlers do not have allergies (477 or 93.2%) or food restrictions (415 or 81.1%) (Table 2).

Table 3. Maternal participation in nutrition health services

Participation type	Frequency (n = 512)	Percentage (%)
Nutrition consulting services		
Never	71	13.9
Yes, with a non-healthcare worker	195	38.1
Yes, with a healthcare worker	246	48.0
Assumption there is a nutritional problem		
Yes	121	23.6
No	391	76.4
Recording of growth measurement results		
Cadre (non-healthcare worker)	404	78.9
Healthcare worker	5	1.0
Both of them	103	20.1
Mother's attitude of reading their children's health status examination		
Never	1	0.2
Seldom	9	1.8
Sometimes	132	25.8
Often	81	15.8
Always	289	56.4
Integrated health post (*posyandu*) visitation		
Never	3	0.6
Seldom	13	2.5
Sometimes	57	11.1
Often	51	10.0
Always	388	75.8
Frequency of pregnancy visitation(s)		
1 time	7	1.4
2 times	14	2.7
3 times	21	4.1
>4 times	470	91.8
Information related to nutrition during pregnancy		
Clear and easy	477	93.2
There is still much to be learned	33	6.4
Difficult to understand	2	0.4

Information related to child nutrition Clear and easy There is still much to be learned Difficult to understand	 441 68 3	 86.1 13.3 0.6
Satisfaction with nutrition-related information Very satisfied Satisfied Less satisfied	 109 390 13	 21.3 76.2 2.5
Satisfaction regarding the monitoring of their child's growth and development Very satisfied Satisfied Less satisfied Not satisfied	 102 385 24 1	 19.9 75.2 4.7 0.2

On average, mothers had nutrition consultations with health workers (48%) or cadres (38.1%). The results of consultations and recording of child growth and development examinations, such as weight and height, were documented more by cadres (78.9%) than health workers (1.0%). After the nutrition consultation, most mothers always read the results of their child's examination (56.4%), and only a small number never read their child's examination report (0.2%). Mothers in this study always visited *posyandu* (75.8%) and thought their children had no nutritional problems (76.4%). The researchers reviewed the patient's antenatal care history and found that the average mother visited > 4 times (91.8%). Researchers also assessed the quality and satisfaction of mothers with nutrition services. Most mothers stated that information related to nutrition during pregnancy and child nutrition was conveyed clearly and easily by counselors (93.2% or 477 mothers) and (86.1% or 441 mothers), respectively. The average mother was also satisfied with the nutrition services they receive (76.2% or 390 mothers) and their child's growth and development (75.2% or 385 mothers) (Table 3).

Table 4. Nutrition fulfilment on the nutritional status of toddlers

		The nutritional status of children under 5		
Characteristics		**Normal**	**Malnutrition**	**Sig 2 tailed**
Exclusive breastfeeding	Yes	329 (64.3%)	81 (15.8%)	0.973
	No	82 (16.0%)	20 (3.9%)	
Introduction of complementary foods	≤6 months	336 (65.6%)	83 (16.2%)	0.921
	>6 months	75 (14.6%)	18 (3.5%)	
Procurement of complementary feeding	Cooking	363 (70.9%)	87 (17.0%)	0.547
	Buying	48 (9.4%)	14 (2.7%)	
Age at the introduction of animal protein	7 months	90 (17.6 %)	23 (4.5 %)	0.849
	>7 months	321 (62.7%)	78(15.2%	
Rejection of animal protein	Yes	11 (2.1%)	4 (0.8%)	0.493
	No	400 (78.1%)	97 (18.9%)	
Family objection to the provision of animal protein				
	Yes	19 (3.7 %)	10 (2.0 %)	
	No	392 (76.6%)	91 (17.8%)	0.04
Introduction of steamed rice	<9 months	258 (50.4%)	60 (11.7%)	0.532
	>9 months	153 (29.9%)	41 (8.0 %)	
Child's meal schedule	Regular	361 (70.5%)	76 (14.8%)	0.001

	Not regular	50 (9.8%)	25 (4.9%)	
Child's meal frequency	2 times	20 (3.9%)	3 (0.6%)	0.71
	3 times	346 (67.6%)	87 (17.0 %)	
	4 times	45 (8.8%)	11 (2.1%)	
Child's snack frequency	1 time	18 (3.5%)	1 (0.2%)	
	2 times	184 (35.9%)	46 (9.0%)	0.256
	3 times	96 (18.8%)	20 (3.9%)	
	4 times	113 (22.1%)	34 (6.6%)	
Food allergies	Yes	29 (5.7%)	6 (1.2%)	0.691
	No	382 (74.6%)	95 (18.6%)	
Food restrictions	Yes	78 (15.2%)	20 (5.9%)	0.85
	No	333 (65%)	81 (15.8%)	

The results show that family objections to the provision of animal protein (p = 0.040) and toddlers' meal schedules (p = 0.001) have a significant relationship with their nutritional status. Meanwhile, the other tested factors resulted in p > 0.05. Therefore, they did not have a significant relationship with the nutritional status of toddlers (Table 4).

Discussion

Stunting is the negative impact of inadequate nutrition during pregnancy and early childhood. It is characterized by below-normal height and impaired cognitive potential.[1,21] The researchers of this study investigated the role of mothers during their child's golden period for stunting prevention, especially regarding nutrition fulfilment for toddlers in a rural area: Kulon Progo, Yogyakarta, Indonesia. The role of mothers during their child's golden period is essential to prevent stunting.[1,19] This period is the most important stage in a child's development and growth for 0-5 years.[15] The development and growth of children during the golden age period require the child to obtain adequate nutrition. The fulfilment of adequate nutrition supports the achievement of normal nutritional status in toddlers.[12] The researchers examined several phases of the mother's role to obtain a comprehensive description of stunting prevention. The mother's role is classified into the pregnancy phase, exclusive breastfeeding phase, complementary feeding phase, and mother's participation in nutrition-based health services.

The mother's role during pregnancy was assessed through their history of ANC. The average respondent has a history of >4 ANC. Routine behavior for ANC visitation positively impacts the mother's pregnancy.[22] During ANC sessions, mothers can receive information on the importance of nutrition fulfilment during pregnancy. Adequate nutrition during pregnancy is one of the early efforts that can be taken to prevent stunting in children.[13,19] This stage is followed by the breastfeeding phase, which is an important phase after giving birth. High coverage of exclusive breastfeeding (410 or 80.1%) was seen in this study. Breast milk is excellent for the infants' growth and development and protects them against gastrointestinal infections that can cause chronic malnutrition.[12,15] A study in Indonesia revealed a significant relationship between exclusive breastfeeding and stunting prevention.[23] Therefore, breastfeeding is an important factor influencing a toddler's nutritional status. Conversely, this study found that exclusive breastfeeding does not have a significant relationship with the nutritional status of toddlers. This may be because most of the toddlers in this study are classified as being of preschool age (78.3%). Thus, only a small proportion of respondents are still given exclusive breastfeeding, which affected the significance value for this factor.

The next phase is the provision of complementary feeding. On average, complementary feeding begins at the age of six months (381 or 74.4%). The WHO and UNICEF recommend that babies at six months should be introduced to complementary feedings that are age-appropriate, nutritious, and safe while continuing with breastfeeding. An adequate diet during the complementary feeding period should be rich in nutrients, does not provide excess energy, free of saturated and trans-fats, and free of sugar or salt.[24] The intake of animal protein should also be considered during complementary feeding. A study stated that protein intake significantly contributed to weight gain in toddlers.[25,35] The standard animal protein intake for toddlers is 42.8 grams/day. Animal protein is a complete protein with high biological value because it contains many essential amino acids

in the appropriate amount for growth.[24] This study revealed that families that do not object to the provision of animal proteins are significantly related to the nutritional status of toddlers. This is because the family is the main factor that affects a toddler's day-to-day nutrition. Economic factors and parental knowledge are related to the importance of nutrition, and culture also influences family behavior patterns in fulfilling toddler nutrition. Family support for fulfilling animal protein intake impacts the achievement of normal nutritional status for their toddlers.[23]

Next, the child's meal schedule also significantly influences their nutritional status. This is supported by a study that found that implementing a regular meal schedule impacts the normal nutritional status of toddlers.[26] The mother's role is also related to managing the frequency and diet of toddlers. Moreover, the provision of snacks is also considered by the mother. This study revealed that the average mother feeds their children with a frequency of three times a day and provides snacks twice a day. Some mothers also applied food restrictions on the grounds of allergic factors. In addition, the mother's behavior in providing homemade complementary feeding impacts toddler health. Behaviors such as providing food in balanced nutritional portions and maintaining good food hygiene positively impact toddler health.[27]

Furthermore, the role of mothers in nutrition-based health services was explored. In this study, maternal awareness was described by the average number of mothers that consulted about their child's nutrition with health workers or cadres. These consultations enable mothers to obtain information on how to fulfill toddler nutrition in a balanced way to support their growth and development.[21,28] Research showed that mothers' knowledge about good nutrition is related to stunting prevention.[29] Moreover, nutrition consultation is important for increasing the mothers' knowledge and awareness of balanced nutrition for toddlers. This research was conducted in Kulon Progo District in mostly rural areas. Therefore, the role of *posyandu* cadres is very prominent in nutrition consultation activities and growth and development tests. Community participation in utilizing the *posyandu* is required. Additionally, health cadres should give training programs to the public about the improvement of the nutritional status of toddlers.[30] Meanwhile, a study conducted in urban areas stated that low birth weight and short stature were the dominant factors associated with stunting.[31]

Several factors do not have a significant relationship ($p > 0.05$) with the nutritional status of toddlers. This result may be because multiple other elements influence these factors. This aligns with a previous systematic review study which revealed that pregnancy factors influenced the incidence of stunting due to lack of nutrition, initiation of early breastfeeding less than 1 hour after birth or not at all, stopping breastfeeding at <6 months, low breastfeeding frequency and complementary feeding <6 or >12 months, and lack of food variation per age-appropriate textures and frequencies.[23] However, two factors had a significant relationship ($p < 0.05$) with the nutritional status of toddlers: family objections to providing animal protein and the child's meal schedules. Therefore, it is hoped that these factors will become a concern for mothers with toddlers and the government in making policies related to stunting reduction. Efforts to optimize the fulfilment of nutrition for toddlers during the golden period require the role of mothers during pregnancy, breastfeeding, complementary feeding, and their participation in nutrition-based health services.

The limitation of this study is that the research was only conducted in one district with participants in the category of mothers with toddlers. Several respondents also experienced difficulties in filling out the online questionnaire via the Google form, so they needed the help of cadres or health workers in their area. Additionally, the research method employed was limited to quantitative data collection. Therefore, the researchers did not obtain a more comprehensive description. Future research should be conducted on a wider scale, such as nationally, by involving multiple sectors, such as the government, fertile couples, and health workers. In addition, researchers can use mixed methods to obtain more comprehensive data.

Conclusion

Prevention of stunting is expected from toddlers in the golden period by considering the role of mother in fulfilling daily nutrition. Mothers in rural area must be concerned about providing animal protein and feeding schedules for their children to contribute to stunting prevention. The government must improve

responsiveness and preparation for increasing the national capacity for stunting prevention by involving the role of mothers in the golden period.

Conflict of interest

There was no conflict of interest in this study.

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Ethics approval

The studies involving human participants were reviewed and approved by Muhammadiyah University (No. 001/EC-KEPK FKIK UMY/IX/2022).

Author contribution

SW: Concept, Data Provision, Data Analysis, Data and Result in Interpretation, Writing and Discussion, LF: Data and Result In Interpretation, Writing and Discussion, OE: Data Provision, Discussion, DN: Concept, Discussion, JH: Data Provision, Discussion. All authors contributed to the article and approved the submitted version

Abbreviations

ANC	: Antenatal Care
Posyandu	: Integrated Services Post
Baduta	: Toddlers under two years of age
Batita	: Toddlers under Three Years

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