

Achievement Acceleration of Stunting Reduction Indicators in Families with Stunting

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Abstract. Stunting rates remain high in several sub-districts designated as stunting loci in Pekanbaru. The aim of this study is to reveal the indicators for accelerating the reduction of stunting in families affected by stunting at the three locations with the highest prevalence of stunting cases and designated as stunting intervention loci. This was descriptive research with quantitative data, and the sample size was 75 families with stunting. The variables studied included mothers experiencing chronic energy deficiency during pregnancy who received a supplemental feeding program, mothers taking iron supplements during pregnancy, exclusive breastfeeding, complementary feeding to breast milk, regular monitoring of growth and development at Posyandu, immunization, and participation in family planning programs include: The results of this study indicated that 25.3% of mothers experienced chronic energy deficiency during pregnancy, with only 21% receiving supplementary feeding programs; 80% of mothers took iron supplements during pregnancy; 78.7% of stunted children were exclusively breastfed; 80% were introduced to complementary feeding; 76% were taken to integrated health posts for regular growth and development monitoring; only 57.3% received complete immunizations; 60% of families participated in family planning programs; and 40% of stunted children resulted from unwanted pregnancies.. The results of the study found that many indicators for accelerating the reduction of stunting in the stunting intervention loci in Pekanbaru City had not yet met the target.

1 Introduction

The World Health Organization (WHO) defines stunting as a developmental disorder in children caused by malnutrition, recurrent infections, and inadequate psychosocial stimulation. When a child's height is less than -2 standard deviations from the median growth standards established by WHO, they are said to be experiencing stunting [1]. Based on the Multicenter Growth Reference Study (WHO-MGRS) standardized criteria, stunting is defined as a condition of significantly short stature [2].

According to the World Health Organization (WHO), in 2018, the global prevalence of stunting in toddlers was 22%. Data from the National Socioeconomic Survey (Susenas) and the Indonesian Child Nutrition Status Study (Studi Status Gizi Balita Indonesia or SSGBI) in

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2019 indicates a higher prevalence of stunting at 27.67% in Indonesia (surpasses the WHO threshold of 22%). In Riau Province, stunting is 23.95%, with Kuantan Singingi District having the highest prevalence at 29.55%. The prevalence of stunting in Pekanbaru City is 11.4% [3]. The highest prevalence of stunting in the city of Pekanbaru is in the Limapuluh Community Health Center work area, and the second highest prevalence is in the Rumbai Bukit Community Health Center work area [4]. Data reported in 2021 from electronic-Community Based Nutrition Recording and Reporting (e-PPGBM) shows that the prevalence of stunting in Limapuluh Community Health Center work area and in Rumbai Bukit Community Health Center work area is higher than national target) [5].

The factors causing stunting consist of both direct and indirect causes. Direct factors include maternal nutritional status, infections during pregnancy, exclusive breastfeeding, birth weight, birth length, and recurrent infections. Additionally, other factors contributing to stunting can be environmental and genetic. Environmental factors such as poor sanitation and limited access to clean water play a role. Indirect factors that can lead to stunting include parenting practices, children's feeding patterns, food availability, family access to clean water, and the reach of healthcare services [6].

The characteristic profile of families with stunted children can be observed through the parents' (especially the mother's) level of education and family income (economic status). It can also be described by indicators of stunting reduction based on Presidential Regulation No. 72 of 2021. These indicators include the nutritional status of the mother during pregnancy, particularly experiencing Chronic Energy Deficiency (CED), pregnant mothers with CED receiving supplementary feeding, iron tablet consumption during pregnancy, exclusive breastfeeding and complementary feeding practices, regular monitoring of child growth and development at integrated health posts (Posyandu), primary immunization for children, family planning programs, health insurance participation, and government assistance programs, whether in the form of cash, social support, or food aid [6].

The high stunting prevalence in several areas of Pekanbaru certainly requires effective and efficient intervention. Therefore, the researcher is interested in conducting a study to obtain the indicators for accelerating the reduction of stunting in families affected by stunting. The data from this study can also serve as a reference for effective and efficient intervention efforts to accelerate the reduction of stunting in Pekanbaru to be more targeted.

2 Method

This was a descriptive survey study with quantitative data on the family profiles of stunted children, observed through the achievement of stunting reduction acceleration indicators in those families. The research was conducted in three focus locations for stunting intervention in Pekanbaru City, Riau Province. The three locations are the work areas of Limapuluh Community Health Center, Rumbai Bukit Community Health Center, and Tenayan Raya Community Health Center. This study was conducted from March 2023 to January 2024. The population of this study consisted of all parents with stunted children. The sample for this study was determined using a consecutive sampling method, with inclusion criteria involving parents who have child with stunting and are willing to participate as respondents. A total of 126 samples were initially obtained for this study, but 51 children were excluded because they were unwilling to participate as respondents. Therefore, the total number of respondents examined was 75. The variables studied included mothers experiencing chronic energy deficiency during pregnancy who received a supplemental feeding program, mothers taking iron supplements during pregnancy, exclusive breastfeeding, complementary foods to breast milk, regular monitoring of growth and development at Posyandu, immunization, and participation in family planning programs. The data collection instrument in this study was an interview guide. The sources of data used were direct statements from respondents and

recorded data from the maternal and child health (KIA) handbook. The data were analyzed descriptively using descriptive statistical methods, with the results presented in the form of frequency distribution tables and narratives, which will be used to draw conclusions.

3 Result and Discussion

The following presents the data from the conducted study, which can be seen in Table 1 below:

Table 1. Frequency distribution of respondent characteristics and the results of achieving stunting reduction acceleration indicators

Variables	Frequency (n)	Percentage (%)	National target in 2024 (%)
Paternal Education			
Low	26	34,7	
Middle	48	64	
High	1	1,3	
Maternal Education			
Low	29	38,7	
Middle	43	57,3	
High	3	4	
Family Income			
Low	63	84	
High	12	16	
History of CED during Pregnancy			
Yes	19	25,3	
No	56	74,7	
Supplementary Feeding in CED during Pregnancy			
Yes	4	21	90
No	15	79	
History of Consuming Iron Supplementation during Pregnancy			
Yes	60	80	80
No	15	20	
Exclusive Breastfeeding			
Yes	59	78,7	80
No	16	21.3	
Complementary Feeding			
Yes	60	80	80
No	15	20	
Growth and Development Monitoring in Integrated Health Post			
Yes	57	76	90
No	18	24	

Variables	Frequency (n)	Percentage (%)	National target in 2024 (%)
Complete Basic Immunizations			
Yes	43	57,3	90
No	32	42,7	
Family Planning			
Yes	45	60	70
No	30	40	
Unintended Pregnancy			
Yes	30	40	15.5
No	45	60	
National Health Insurance Membership			
Yes	32	42,7	100
No	43	57,3	
Cash Assistance			
Yes	7	9,3	90
No	68	90,7	
Social and Food Assistance			
Yes	17	22,7	90
No	58	77,3	

Based on the results, most of the stunted children's parents had a middle-level education (high school or equivalent), with 64% of fathers having a middle-level education and 57.3% of mothers having a middle-level education. The second most common result was fathers with a low level of education at 34.7% and mothers with a low level of education at 38.7%. These research findings align with a study conducted in South Jakarta, which reported that the majority of parents of stunted children had a middle-level education (48.5%) (Jannah, 2022). The study also suggested a correlation between the parent's education level and the occurrence of stunting. These findings are consistent with research in Ecuador, South America, which indicated that 60.69% of mothers of stunted children had a low level of education, 35.83% had a middle-level education, and 3.46% had a high level of education [7].

Education levels are divided into three categories based on Law No. 20 of 2003 regarding the national education system: low, middle, and high. The low education level includes primary and junior secondary education (elementary, junior high, or equivalent). The middle level includes senior secondary education (senior high school, vocational high school, or equivalent), while the high level includes a diploma and bachelor's degree or equivalent. Education plays a significant role in an individual's ability to receive and process information. The parent's education level also influences their knowledge regarding the nutritional needs of their children [8]. Mother's education is one of the factors that impact her level of knowledge. A broad knowledge base is crucial for ensuring that the nutritional needs of both the household and the child are met. This, in turn, affects the choice of food, food variety, identification of the child's nutritional needs, and feeding practices. Mothers with higher education and good nutritional knowledge are expected to be capable of providing the right types and amounts of food to meet their child's nutritional requirements and prevent the risk of stunting [9].

Based on the results, the majority of parents with stunted children had low incomes (below the minimum wage in Pekanbaru). This result is consistent with a study in Semarang,

which reported that 69% of families with stunted children have income below the minimum wage and also indicates an association between family income and the occurrence of stunting, with families earning below the minimum wage being 2.547 times more likely to have a stunted child compared to families with income above the minimum wage [10].

Family income or economic status is also influenced by the parent's level of education. Higher parental education provides opportunities to secure sufficient income to meet food availability [11]. Economic status also affects access to healthcare services, as families with higher economic status are more likely to access healthcare facilities, while those with lower economic status face constraints in healthcare access due to financial issues [12]. Family income is one of the primary causes of stunting as it is related to the availability or fulfillment of children's nutritional needs. Higher family income can also fulfill the nutritional needs of mothers during pregnancy, the introduction of complementary feeding (MPASI), and the completion of basic immunizations. Insufficient income or low family economic status leads to decreased purchasing power for food items, resulting in unmet nutritional needs for children. Consequently, children may experience malnutrition, and over the long term, they may be at risk of stunting [13].

Based on the results, the majority of mothers with stunted children did not have a history of Chronic Energy Deficiency (CED), accounting for 74.7%. This result is consistent with a study in Klaten, where 28 out of 30 mothers with stunted children did not experience Chronic Energy Deficiency (CED) [14]. It is also consistent with a study in Surakarta, which similarly found that 69.4% of mothers with stunted children did not have a history of Chronic Energy Deficiency.[15].

The factors causing Chronic Energy Deficiency (CED) in pregnant women may be related to family income, parity, age, dietary patterns, maternal knowledge, and infectious diseases. Families with low income may struggle to meet the nutritional needs of pregnant women, increasing the risk of CED. Dietary patterns and maternal knowledge also influence the incidence of CED, as a mother's understanding of whether consumed foods contain sufficient nutrients, unbalanced dietary patterns, and inadequate nutrition can contribute to CED over the long term. Infectious diseases are also a factor in the incidence of CED due to decreased appetite and disruptions in nutrient absorption in the digestive tract [10].

The health condition of a mother during pregnancy, such as Chronic Energy Deficiency (CED), affects the growth and development of the fetus in the womb. Chronic Energy Deficiency can occur due to insufficient intake of macro and micronutrients from adolescence to pregnancy. Inadequate energy intake during pregnancy results in reduced nutrient intake for the fetus, as the nutritional intake is used to fulfill the mother's needs, thereby hindering fetal growth and development. Impaired fetal growth and development pose a risk of low birth weight, which is one of the risk factors for stunting in children. Low birth weight babies face challenges in catching up with growth and development, potentially leading to stunting. The status of CED can be determined after measuring the upper arm circumference (UAC) during pregnancy, and it is considered CED if less than 23.5 cm [14].

Based on the results, most pregnant mothers with a history of Chronic Energy Deficiency (CED) were not provided with supplementary feeding during pregnancy, accounting for 78.9%. The purpose of supplementary feeding is to fulfill the nutritional needs of pregnant women during the pregnancy period, especially for those at risk of CED [16]. The provision of supplementary feeding for pregnant women to address CED is one of the health ministry's programs aimed at reducing and preventing stunting incidents in Indonesia. Supplementary feeding is also an approach to handling CED and a strategy for preventing maternal malnutrition by providing additional calories and protein without substituting regular daily meals. When pregnant mothers with CED do not receive supplementary feeding, there is no additional total energy intake to address CED. As a result, when mothers with CED experience reduced nutrient intake for the fetus, fetal growth is impaired, and mothers with

CED are at risk of giving birth to low birth weight (LBW) or premature infants with higher risk of experiencing stunting [16].

Based on the results, the majority of stunted children's mothers consumed iron supplementation during pregnancy. This result differs from a study in Palangkaraya, which stated that 67.9% of stunted children's mothers did not take or consume iron supplement tablets during pregnancy [17]. The distribution of iron supplementation tablets is one of the programs carried out by the health department. The aim is to prevent anemia in pregnancy because it is one of the risk factors for stunting. Anemia due to insufficient iron in the first and second trimesters doubles the risk of premature birth and triples the risk of low birth weight. Premature and low birth weight babies are one of the risk factors for stunting [18]. Anemia is a condition when the hemoglobin (Hb) level in red blood cells is lower than normal. Pregnant women are considered anemic if their Hb level is lower than 11 g/dl. The consumption of iron supplementation is mandatory for pregnant women, with a minimum of 90 tablets during pregnancy, as the need for iron increases to form new cells and tissues, including the brain tissue in the fetus. The level of education can also influence the consumption of iron supplement tablets, as higher education correlates with broader knowledge and a higher level of nutritional knowledge. Mothers with higher education are more likely to understand the importance of compliance in taking iron supplementation tablets during pregnancy and the benefits of these tablets for optimal fetal nutrition [18]. According to the author's perspective, the absence of iron supplementation during pregnancy increases the risk of anemia due to the lack of micronutrient nutritional intake for pregnant women. Anemia in pregnancy can lead to fetal malnutrition, resulting in premature or low birth weight infants and ultimately leading to stunting.

Based on the result, it was discovered that more than half of the children who were stunted had received exclusive breastfeeding and complementary feeding. This finding is consistent with a study conducted in Bogor, which reported that 70.3% of stunted children had received exclusive breastfeeding and 73.4% were given complementary feeding [19]. However, some studies show different results. For instance, in West Sulawesi, 91.7% of stunted children did not receive exclusive breastfeeding [20]. Similarly, research conducted in Jakarta indicated that 66.6% of stunted children did not receive exclusive breastfeeding. Additionally, the study mentioned that 53.3% of stunted children had received appropriate complementary feeding [21].

Exclusive breastfeeding refers to the practice of providing only a mother's milk to an infant for the first six months, without any other food or drink, except for medicine. Breast milk is an excellent source of nutrition for infants, as it is easier to digest than formula milk, and contains colostrum that is rich in antibodies and secretory IgA, providing local protection to the gastrointestinal tract. Moreover, exclusive breastfeeding is known to strengthen the emotional bond between a mother and her baby, improve child intelligence, and help the baby achieve ideal weight [22]. In contrast, infants who do not receive exclusive breastfeeding may suffer from nutritional deficiencies and are more likely to get infections due to the absence of natural antibodies in breast milk. Prolonged nutritional deficiencies and susceptibility to infections can lead to the incidence of stunting in children [23].

Complementary feeding is a type of feeding practice with food that can be easily consumed and digested by infants. Introducing complementary feeding has numerous benefits, including providing the baby with a more complete source of nutrition as their nutritional needs increase as they grow, and breast milk alone may not be sufficient. WHO guidelines suggest seven recommendations for complementary feeding, which include continuing breastfeeding until the child reaches two years of age. For infants aged 6-11 months who are not breastfed, formula or animal milk can be given, while for infants aged 12-23 months who are not breastfed, pure animal milk is recommended and formula milk is not encouraged. It is also recommended to introduce complementary feeding at six months

(180 days) while continuing breastfeeding, avoiding unhealthy foods and drinks, providing nutritional supplements and fortified food products, and promoting diversity in complementary feeding [24]. The differences in results found in this study may be due to existing intervention programs for stunting by healthcare professionals in primary healthcare, such as exclusive breastfeeding and complementary feeding.

The study found that 76% of stunted children were taken to integrated health posts (Posyandu) for regular growth and development monitoring. This percentage is markedly higher than the 6.6% reported in a study conducted in Bali [25]. Monitoring growth and development at Posyandu is a specific intervention aimed at accelerating the reduction of stunting. The Posyandu program is designed to prevent and reduce stunting by including fortification of iron in supplementary foods, regular checking of height and weight, deworming medication, diarrhea prevention, and basic sanitation. Additionally, Posyandu helps monitor the nutritional status of children under five. However, the effectiveness of Posyandu is reduced due to factors such as some mothers being unwilling to bring their children and some cadres needing more understanding of stunting management and programs. When children are not brought to Posyandu, it becomes difficult to detect stunting risk when there is a prolonged lack of weight or height gain since their height and weight are not measured [26].

The study also found that 57.3% of children who suffered from stunting received complete basic immunizations according to age. This result is similar to another study conducted in Bandung, which reported that 53.3% of stunted children received complete basic immunizations [27]. However, a study conducted in Jakarta showed contrasting results, where 86.6% of stunted children did not receive complete basic immunizations [21]. Immunization is an important measure to strengthen the body's defense against diseases. It helps individuals to either not get sick or experience mild symptoms when exposed to a disease. Immunization can also prevent stunting by boosting the body's defense system and preventing children from getting infected. Children who do not receive basic immunizations become more vulnerable to infections or diseases. Children who experience infections or illnesses for a long term are at risk of stunting, either due to the disease itself or malnutrition resulting from a decreased appetite during illness.

Based on the result, it was observed that 60% of families participate in family planning programs, and 40% of stunted children are unintended or unplanned births. However, there are 40% of families with stunted children not participated in family planning program. Family planning are most effective way for reducing birth rates and reducing risk factor of stunting. Long-term contraception can be used for an extended period time (more than two years) and are practical and efficient for the birth spacing of more than three years or, birth control for couples who have no intention of adding more children [28]. This result is consistent with a study conducted in the Cikunir Village, Singaparna Subdistrict, which found that 73.5% of mothers with stunted children participated in family planning programs [29]. The study also highlights that adequate birth spacing and interventions to minimize unintended pregnancies can reduce the prevalence of stunting. Family planning programs play a crucial role in stunting prevention efforts, as the World Health Organization (WHO) has initiated a global action to reduce high stunting rates. Reducing both birth rates and the still-high prevalence of stunting can be achieved through family planning programs [30]. The differences in the results obtained from this research may be attributed to the existing interventions for stunting programs by healthcare professionals, such as routine monitoring of child growth and development in integrated health posts (Posyandu) and participation in family planning programs in the primary healthcare center.

Based on the result, it was discovered that most families with stunted children do not participate in the national health insurance program. The findings are consistent with those in Depok, which reported that 71.1% of families with stunted children do not have health

insurance [31]. However, several results are inconsistent with this study, as indicated by a study in Sukabumi, where only 37.25% of families lacked health insurance, and the remaining 62.75% were PBI, KIS, and private BPJS users [32]. In Tasikmalaya, a study also observed that most families with stunted children have health insurance such as BPJS and KIS [33]. National health insurance program membership also provides health protection through health maintenance benefits to fulfill basic health needs. When not participating in health insurance, leaving a child suffering from a prolonged illness or infection can pose a risk of stunting, either due to the illness or malnutrition resulting from a decreased appetite during illness. According to the author's perspective, having a health insurance program is essential for easy accessibility to healthcare services. It also provides benefits like regular nutritional check-ups and immediate assistance in case of children's illnesses.

This study also found that the majority of families with stunted children did not receive government assistance, either in the form of cash or social and food assistance. This assistance may come in the form of the Family Hope Program and the Family Social Security Program. These programs not only help meet basic needs and ensure food availability but also encourage access to health care facilities, education facilities, and social welfare services for economically disadvantaged families, especially those with pregnant women and toddlers. These programs are expected to help reduce the prevalence of stunting [34].

Improving nutritional intake can reduce the risk of stunting in children [35]. Families with stunted children, if not assisted, may experience a decrease in purchasing power and consumption of nutritious food, which may lead to inadequate nutrition for the child, increasing the risk of stunting [34]. According to the author's perspective, government assistance in the form of cash or food can help increase the consumption of nutritious food, especially in economically disadvantaged families. This ensures that the child's nutritional needs are fulfilled and reduces the prevalence of stunting

4 Conclusion

This study has proved that there were still several indicators for accelerating stunting reduction that had not yet reached the target for families with stunted children in three stunting intervention loci in Pekanbaru City, including; Supplementary Feeding in Chronic Energy Deficiency (CED) during Pregnancy, Exclusive Breastfeeding, Growth and Development Monitoring at Integrated Health Posts, Complete Basic Immunizations, participation as a family planning acceptor, Unintended Pregnancy, National Health Insurance Membership, Cash Assistance, and Social and Food Assistance. The results of this study can be used as evaluation material to improve health programs according to the indicators that have not yet met the target, so that stunting intervention becomes more directed, effective, and efficient, and can help accelerate the reduction of stunting prevalence.

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