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Analysis of Nutritional Status in Stunted Children (0-5 Years)

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Abstract. Stunting is a global development problem that jeopardizes physical and cognitive development and economic productivity. Stunting cases in Indonesia are pretty high; although it decreased in 2019 to 27.67%, stunting reduction efforts are still being carried out intensively. Monitoring of nutritional status needs to be done regularly to determine the success of interventions. This study aimed to describe the nutritional status of stunted children aged 0-5 years in Tegal City. This study was a descriptive survey with a retrospective approach. Cluster sampling was used and obtained 187 stunting children. We collected the data from November to December 2021 and analyzed it using univariate tests. The results showed that mostly stunting was found in boys (55.6%). Most stunting cases were children with shorter stature (64.7%). The nutritional status of stunting children is mostly normal, so that interventions are only carried out in stunting cases. However, there were minor cases where 3.2% of stunting children were obese. There is a need for government policies to declare cross-sectoral programs to reduce stunting rates. Health workers need to be more aware of stunting cases with obesity.

1. Introduction

The high prevalence of stunting in children is a global problem related to poverty [1]. Stunting in children has a considerable impact on countries where children will experience delays in physical and mental development and can also pass on stunting cases to their generation [2]. Stunting also causes an increased risk of obesity [3], cognitive delay [4], affects learning performance, and has a long-term impact on economic productivity [5]. In addition, stunting is one of the causes of the death of as many as one million children every year. Therefore, reducing the incidence of stunting is an important and urgent matter to be handled [6].

Indonesia is a developing country with a reasonably high stunting problem [7]. The prevalence of stunting in Indonesia has decreased; wherein 2018, the prevalence of stunting reached 30.8% and decreased to 27.67% in 2019 [8]. To deal with the problem of stunting, the government has issued policies involving many sectors such as strengthening food, developing an information data center, improving health for pregnant women, nutrition interventions, intervention in the first 1000 days of birth [9].

Handling stunting is also carried out by increasing parents' understanding of the importance of fulfilling nutrition during pregnancy and exclusive breastfeeding. Monitoring the growth and development of stunted children also needs to be done regularly by paying attention to weight for age, height for age, and weight for body length [10]. Monitoring is vital to do so that stunting is adequately implemented. Inadequate handling can lead to unattainable improvement of the condition in children [11]. Monitoring nutritional status is vital in handling stunting cases. Therefore, this research was conducted to identify the nutritional status of stunted children in Tegal City in 2021.

2. Methods

This study used a descriptive survey with a retrospective approach to describe nutritional cases in stunted children in Tegal City through data from the integrated stunting prevention information system or SSGBI. The collection of stunting status data was scheduled every February and August every year. Therefore, the data used in this study was data on stunting reported in August 2021. The population was all children aged 0-5 years diagnosed with stunting at the Integrated Healthcare Center or the first health facility and reported to the SSGBI [8]. The sampling technique used was cluster sampling. This study selected the sample by classifying stunting children based on the Public Health Center that handled stunting with the highest, lowest and moderate number of stunting cases [12]. The Public Health Center with the highest stunting cases was the Tegal Timur Public Health Center, and the lowest cases were in the Slerok Public Health Center. While the moderate stunting cases were in the South Tegal Public Health Center, so the number of respondents in this study was obtained as many as 187 respondents. Data collection was carried out from November to December 2021. The instruments used in this study were field notes and dummy tables—analyzed data using univariate analysis to identify stunting status.

3. Results and Discussion

This study was conducted to identify the nutritional status of stunted children. Parameters of nutritional status of children under five were calculated using the formula weight for age and weight for height [13]. While stunting was assessed from height for age [14]. This research was conducted in three public health centers with various cases, and the characteristics of the respondents were as follows:

Tabel 1. Karakteristik Responden

Variable	f	%
Public Health Center		
Tegal Timur	126	67.4
Tegal Selatan	47	25.1
Slerok	14	7.5
Age when measured (years old)		
0	6	3.2
1	25	13.4
2	55	29.4
3	47	25.1
4	43	23.0
5	11	5.9
Sex		
Boy	104	55.6
Girl	83	44.4
Height for Age		
Severe stunted	121	64.7
Stunted	66	35.3
Weight for Age		
Severe undernourished	52	27.8
Undernourished	82	43.9
Normal	53	28.3
Weight for Height		
Severe wasted	3	1.6
Wasted	56	30.0
Normal	122	65.2
Overweight	6	3.2

Most cases of stunting were found in boys (55.6%). Several studies showed that most stunted children in South Asian and Southeast Asian countries were boys, including in Indonesia [15], [16]. Boys are biologically more vulnerable than girls. Boys are easier to influenced by stressful environments [17]. However, due to the limited number of respondents, this result cannot be ascertained whether sex is a factor causing stunting; to determine whether males are a predisposing factor for stunting, it needs further study by comparing stunting cases throughout the Tegal city or comparing with the same region and characteristics [15].

The majority of respondents have had stunting screening for 0 months. This was done to detect the risk of stunting earlier so that immediate treatment could be carried out [18]. The results of previous studies also found an increase in stunting cases in children < 2 years. Stunting under two years showed a significant association with children's cognitive at the age of 5-11 years [1]. The finding of stunting in children <2 years old can be influenced by nutritional fulfillment during pregnancy, risky pregnancies, birth weight, gestational age, and history of non-exclusive breastfeeding [19]. Age under two years is the most appropriate opportunity to provide intervention in stunting to minimize delays in children's cognitive development [20].

Based on the results, it was found that respondents aged 3-4 years (48.1%) still experienced stunting. Stunting detected at this age is classified as late-onset. However, the potential for cognitive development delays is smaller than stunting detected under two years. In addition, the handling of stunting at this age is more accessible; most children are stunting-free at the age of 4.5-6 years [19].

The nutritional status of children is calculated from weight for age. In table 1 showed that most respondents (43.9%) were undernourished. This parameter is often used to monitor the children's nutritional status [15]. Nutritional status is often associated as a factor causing stunting. The presence of nutritional deficiencies in the body affects a child's growth. Nutritional deficiencies also increase the risk of infection. Children who have infections tend to lose their appetite, so nutrients are mainly used for recovery than growth [21].

Table 2. Frequency Distribution of Nutritional Status of Stunted Children

	Height for Age		Total
	Sangat Pendek	Pendek	
Weight for Age			
Severe Undernourished	22 (42.3%)	30 (57.7%)	52 (100%)
Undernourished	52 (63.4%)	30 (36.6%)	82 (100%)
Normal	47 (72.3%)	6 (27.7%)	53 (100%)
Weight for Height			
Severe Wasted	1 (33.3%)	2 (66.7%)	3 (100%)
Wasted	26 (46.4%)	30 (53.6%)	56 (100%)
Normal	91 (74.6%)	31 (25.4%)	122 (100%)
Overweight	3 (50%)	3 (50%)	6 (100%)

Most stunted children were well-nourished; it shows that children only have stunting problems. Furthermore, undernourished children are still receiving treatment to improve child nutrition. However, in table 2, there are cases of stunting children with overweight or obesity. Stunting cases with obesity are generally found in children who have received previous nutritional treatment, but they experience metabolic changes, which cause an increased risk of obesity. Stunting can cause interference with the fat oxidation process so that the incoming nutrients cannot be broken down into energy [22]. It shows that chronically malnourished children can develop into decompensation or overweight, depending on environmental conditions and the characteristics of the child [23].

Stunting with obesity is short but has a fat body [23]. They had nutrition improvement, and the incidence of infection or illness decreased. The child's weight increased, but not their height. Stunting conditions also have a relationship with obesity in adulthood [24]. Considering obesity is one of the effects of stunting treatment, it is necessary to re-evaluate the treatment given to chronic stunting children. Because if stunting cases with obesity increase, the child morbidity will be higher. Children

will be at risk for obesity in adulthood, increasing the risk of type 2 diabetes, cardiovascular disease, chronic kidney disease, and cancer. Obesity also increases mortality and premature mortality [25].

In handling stunting, health workers need to consider maternal history, especially in children with stunting under the age of 2 years. So that handling does not only focus on improving nutritional status but also needs to increase children's physical activity to minimize the occurrence of stunting with obesity [25]. Government support through policies is also needed, especially supporting programs outside of health programs such as providing children's physical activity facilities, providing road facilities, improving sanitation, and so on [26].

4. Conclusion

Stunting detection in Tegal City has been carried out since children are 0 months old to handle stunting early. Most stunting cases are found in boys, but to justify sex as a predisposition factor of stunting, it needs further study by comparing stunting cases in areas with the same characteristics. Most stunted children were well-nourished. However, there are cases of stunting with obesity. This dual problem of malnutrition, even though it is a minor case, needs to be prevented and treated so that the prevalence does not increase. The policy implications of supporting stunting management need to be reviewed by paying attention to stunting cases with obesity. The implications of the research need further research to identify the factors of stunting with obesity and the interventions that have been accepted to obtain best practices in handling stunting with obesity.

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