Determinants of Stunting Children Under Five of Age in Kendari City: A Community-Based Matched Case-Control Study

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Abstract. A risk indicator for underdeveloped children is stunting. Stunted children under five make up an estimated 22% of the global population under five. Over 50% of stunted infants under five years old worldwide reside in Asia. This study looked at low birth weight and gender in stunted children under five years old. In Kendari city, South East Sulawesi, a Matched Case Control study was carried out at random in seven subdistricts between August and September of 2023 on a sample of 180 children, 90 of whom were stunted (cases) and 90 of whom were not, with their respective mothers. The children ranged in age from 24 to 59 months. A questionnaire that was given out in person by an interviewer was used to gather data. SPSS was used to examine the data. The McNemar test was utilized to determine the contributing factors of stunting. The 95% confidence interval (CI) and $p < 0.05$ were used in conjunction with the odds ratio (OR) to assess significance. Five-year-olds account for half of all incidences of stunting in children. In the sample, the proportion of boys and girls was about equal. The odds ratio [OR]: 0.2, 95% confidence interval [CI]: 0.1 – 0.5; P>0.05 for stunted children under five years old, and the odds ratio [OR]: 0.9, 95% confidence interval [CI]: 0.5 – 1.6 for children's gender, did not correlate with low birth weight. It is necessary to create prevention-related initiatives and inform the public about the significance of eating a healthy diet when pregnant.

Keywords: Stunting, children, case control

1. Introduction

The first thousand days of birth, known as the golden period starting from pregnancy to the birth of a baby until two years old, is a very important time because during this period the growth and development process takes place very quickly and can determine how the quality of a human's life [1]. A child's growth is mostly determined by their mother's and child's nutrition, as stunting may affect a child's development from conception until the third or fourth year of life [1]. Stunting in children has several negative effects, including impaired learning and development, increased risk of infections and noncommunicable diseases, increased morbidity and death, and lower productivity [2],[3].

Due to four factors, including its widespread prevalence, its short- and long-term health effects (such as poor cognitive function and academic performance, low adult wages, and lost productivity), the fact that stunting occurs during the golden period of

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a child's development, from conception to the first two years of life, when linear growth is most susceptible to environmental factors like feeding, infection, and psychosocial care, and the fact that it is a cross-cutting issue requiring a multisectoral response, it has now become a major public health concern in children worldwide [4].

In the Southeast Asia region, Indonesia occupies the first position with the highest number of stunting cases (31.8%) compared to other Southeast Asian countries, namely Lao PDR (30.2%), Cambodia (29.9%), Philippines (28.7%), Myanmar (25.2%) and Vietnam (22.3%) [5]. The Indonesian Nutrition Status Survey (SSGI), conducted over the course of the preceding three years, revealed that stunting is more frequent among nutritional concerns than malnutrition, thinness, and obesity. Stunting instances reached approximately 27.7% in 2019, 24.4% in 2021, and 21.6% in 2022 [6]. With over 30.2% of children under five suffering from stunting in 2021, Southeast Sulawesi is one of the provinces in Indonesia with the greatest incidence of this condition. It places fifth overall [7]. However, in 2022 the prevalence of stunting decreased to 27.7%. Despite the decrease in 2022, Southeast Sulawesi is still in the top 10 provinces with the highest prevalence in Indonesia [6].

Child stunting is caused by several complex risk factors, namely family, environmental, social, and cultural factors [8]. The purpose of this study is to investigate the reasons of stunting in children under five in Kendari, Southeast Sulawesi, Indonesia.

2. Method

In August and September of 2023, 180 pairs of women and their 0-59-month-old children took part in a community-based case control study that was conducted at random in seven subdistricts of Kendari city, South East Sulawesi. Data was collected in accordance with recognized health practices during home visits. The health administration at the study location granted approval for the study to be carried out. It was decided who would participate by simple random sampling. We employed a systematic survey.

The one-sample test of was used to determine the participant count. Consequently, 180 mother-child pairs were the minimal sample size that could be determined. The subdistricts chosen for this investigation were located in a region that the BKKBN Southeast Province has classified as a stunting locus. The qualifying kid satisfied both the inclusion and exclusion requirements. The criteria for inclusion were mothers who had resided in the research region for at least a year, children ages 0 to 59 months, and the lack of congenital defects that had been identified since birth. The children under five who had significant illnesses, such as cancer or COVID-19, that needed them to be hospitalized in isolation or receive critical care were excluded from the sample.

Enumerators who have completed their degrees in public health and received training in data collection methods and procedures collected the data. To ascertain the differences in stunting among children under five by explanatory factors, a bivariate analysis was carried out. A McNemar test was employed to ascertain if stunting and certain risk factors were significantly correlated. With SPSS 17.0, the statistical analysis was performed. The odds ratio (OR), with a 95% confidence interval (CI) and $p < 0.05$, was used to assess significance.

3. Results

3.1 Characteristics of Study Respondents

Out of 180 responders, 50% of children in Kendari city under five years old had stunting. There were almost equal numbers of boys and girls in the sample, from 97 male children, of which 47 were stunted (48.45%) and 50 were not stunted (51.55%). The number of female children was 83, including 43 people (51.81%) who were stunted and 40 people (48.19) who were not stunted. Based on the age of children, most of the children were 2 years old, among them were 44 people (46.81%) experienced stunting and 50 (53.19%) did not experience stunting.

Table 1. Frequency distribution of respondents

Characteristics Respondents	Stunting (n=90)	Non-Stunting (n=90)
Gender		
Boys	47 (48.45)	50 (51.55)
Girls	43 (51.81)	40 (48.19)
Age of Toddler		
1 Years old	9 (56.25)	7 (43.75)
2 Years old	44 (46.81)	50 (53.19)
3 Years old	27 (51.92)	25 (48.08)
4 Years old	10 (55.59)	8 (44.44)

3.2 Bivariate Analysis of Determinants of Stunting

The findings of Table 2's bivariate analysis show that there does not seem to be a significant correlation between low birth weight (p-value = 0.000; OR = 5,688; 95% CI = 2.210 – 14.638) or gender in Kendari city when it comes to the incidence of stunting in children under five.

Table 2. Factors related with stunting under five years in Kendari city

Variable	Categories	Frequency, n (%)		P Value	OR (95% CI)
		Stunting (n=90)	Non-Stunting (n=90)		
Gender	Boys	47 (52.2%)	50 (55.6%)	0,765	0,874 (0.486 – 1.572)
	Girls	43 (47.8%)	40 (44.4%)		
Low Birth Weight	Yes	26 (28.9%)	6 (6.7%)	0.000	5,688 (0.068 – 0.453)
	No	64 (71.1%)	84 (93.3%)		

4. Discussion

This study found a substantial correlation between the occurrence of stunting among children under five in Kendari city and low birth weight. The study found that low birth weight (LBW) was the primary factor linked to stunting. A child's risk of stunting was six times higher if their family history included LBW. Fascinatingly, similar research indicates that in Indonesian children aged 12 to 23 months, LBW became the primary risk factor for stunting [9]. A related study also revealed a link between stunted children and LBW history. Youngsters who have LBW in their family are 5.87 times more likely to be stunted [10].

After two months, BW babies face a stall in their growth. Failure to develop at two months of age is indicative of a higher chance of growth failure later on. LBW babies do not catch up to normal-length children by the time they are 12 months old; in other words, their catch-up growth is insufficient. For LBW children, catch-up growth continues until the kid becomes two years old. Stunting in toddlers is caused by a pathological condition known as failure to thrive and inadequate catch up growth [11]. Because the digestive tract is still developing, LBW newborns also have digestive tract issues. For example, their bodies are less able to digest protein and absorb fat, which leaves them with inadequate nutritional reserves. Consequently, low birth weight kids' growth will be disturbed, and if this condition persists with insufficient nutrition, recurrent illnesses, and subpar medical treatment, children may suffer from stunting [12].

The frequency of stunting in children in Kendari City does not appear to be correlated with gender, according to this study. The study's findings are consistent with earlier research showing that, in the Yogyakarta region of the Kalasan Health Center, gender had no impact on the frequency of toddler stunting. The possible cause is that in toddlers there is no visible difference in the speed and achievement of growth between men and women. This difference will begin to appear when entering adolescence, where women will experience an increase in growth rate first. This causes men and women to be at the same risk of stunting [13].

5. Conclusion

Our research results convinced that among Indonesian children aged 0 to 59 months, LBW was associated with higher levels of stunting. Initiatives related to prevention need to be established with educate the public about the importance of intake nutrition during pregnant.

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