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Association Between Antenatal Visit and Stunting in Children Aged 0-59 Months in Margadadi Health Center, Indramayu, West Java, Indonesia

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ABSTRACT

Background: Stunting is a condition where a child's height does not match their age caused by persistent nutritional disorders. The incidence of stunting in the Indramayu area is quite high, namely 29.19% in 2019 which exceeds the WHO target of 20%. Antenatal visits indirectly induce stunting since stunting factors can be seen prenatally. Antenatal visits are a series of comprehensive examinations for pregnant women. The Indonesian Ministry of Health's 2021 recommendations divide antenatal visits into the first (K1), fourth (K4), and sixth (K6) visits. This study aimed to discover the relationship quantity of antenatal visits and the incidence of stunting in toddlers in the Margadadi Puskesmas Working Area, Indramayu Regency.
Subjects and Method: A case-control study conducted at the Margadadi Community Health Center, Indramayu, West Java, Indonesia. A total of 60 moms of toddlers selected in this study use the consecutive sampling, with 30 subjects each as a case and control group. The dependent variable was stunting. The independent variables were ANC visit follow are K1, K4, and K6. Data collected by questionairre. Data were analyzed by Chi-Square test.
Results: Pregnant women who had complete K6 antenatal visits had lower risk to have stunted children (OR= 0.20; 95% CI= 0.04 to 1.02; p= 0.038).
Conclusion: K6 shows a protective relationship on stunting.

Keywords: antenatal visits, stunting, toddlers.

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BACKGROUND

Stunting is a condition that greatly inhibits growth in children. Stunting is characterized by a Z-score less than -2 SD for the ratio of height to age or the ratio of body length to age following Child Growth Standards, as

defined by the World Health Organization (WHO, 2014). Stunting can occur due to malnutrition for a long time from the womb until the age of 2 years (Ministry of Health RI, 2018). Toddlers with stunting will have problems with theisr growth, as well as their cognitive and motor development (Titaley et al., 2019).

Based on the Global Nutrition Report in 2014, Indonesia is among the 17 countries which have 3 common nutritional problems, including stunting, wasting, and overweight. Stunting affects 31.8% of children under-fives in Indonesia, which is a fairly high prevalence. According to the 2019 Indonesian Toddler Nutritional Status Study (SSGBI) report, Indramayu has a stunting prevalence of 29.19%, ranking 4th highest in West Java Province. This figure is fairly high because it has exceeded the 20% mark which is the target set by WHO. This figure is also still very far from the plan to reduce stunting rates with the target set by the Government of Indonesia of 14% by 2024. If this condition continues, WHO predicts that there will be 127 million children who will be stunted by 2025 (WHO, 2014).

Antenatal visits are a series of comprehensive and quality examination procedures thsat are carried out from the moment of conception to shortly before birth (Ministry of Health RI, 2020). Antenatal visits are divided into several visits, namely the first antenatal visit (K1), the fourth visit (K4), and the sixth visit (K6). Both K1, K4, and K6 have an important influence on determining fetal growth in the prenatal period. In the prenatal period, factors that will cause stunting can also be detected when the fetus is born (de Onis and Branca, 2016) so antenatal visits can be an indirect cause of stunting. Based on a report from the Margadadi Health Center in December 2021, it was reported that the antenatal visit coverage owned by the Margadadi Health Center was 100.86% for K1, 100.61% for K4, and 97.18% for K6. Although the Margadadi Health Center's goal of enhancing antenatal visits is being accomplished, the percentage of visits between K1, K4, and K6 is decreasing.

In the past, several studies have been carried out related to the relationship between antenatal visits and stunting events. Previous research conducted by Hutasoit, Utami, and Afriyliani (2020) stated that there is a significant relationship between antenatal visits and stunting events, where in the study the results of a low prevalence of antenatal visits (46%) can increase the prevalence of stunting events (69%). The research is in accordance with a research done by Camelia et al. (2020) where results were obtained that there was a meaningful relationship between the quality and quantity of antenatal visit history and stunting events.

Seeing that the stunting incidence rate is quite high in the Indramayu area exceeding the target given by WHO and the Indonesian Government, and several previous studies say that antenatal visits affect the incidence of stunting, researchers are interested in conducting research related to the association between antenatal visits and stunting in under-fives children in Margadadi health center, Indramayu district. The researcher aims to examine the relationship between K1, K4, and K6 with the incidence of stunting in toddlers in the work area of the Margadadi Health Center, Indramayu Regency.

SUBJECTS AND METHOD

1. Study Design

This study is an observational analytical study with a case-control research design. This research was carried out for 4 months, namely, in September to December 2022 in

the working area of the Margadadi Health Center, Indramayu Regency, which is in charge of 9 urban villages.

2. Population and Sample

A mother who had a toddler at the Margadadi Health Center who was in charge of 9 villages, including Pabean Udik, Lemahmekar, Lemah Abang, Margadadi, Paoman, Karangsong, Karang Anyar, Karang Malang, and Tambak made up the study's population. The sample size of 60 participants was used, with 30 participants serving as the case group and 30 participants serving as the control group.

The case group's inclusion criteria were moms with stunted toddlers who lived in the Margadadi Health Center's service area and had full mother-child health (MCH) records, while the case group's exclusion criteria were women who were in preterm labor and mothers whose children were sick.

The control group's inclusion criteria were moms with toddlers who were not stunted that lived in the Margadadi Health Center's service area and had full mother-child health (MCH) records, while the case group's exclusion criteria were women who were in preterm labor and mothers whose children were sick.

3. Study Variables

The dependent variable was stunting. Stunting data was collected from secondary data in the Margadadi Community Health Center's work area. The independent variables were the first antenatal visit (K1), the fourth antenatal visit (K4), and the sixth antenatal visit (K6). The independent variables will use secondary data collected from the KIA handbook held by each mother with a toddler.

4. Operational Definition of Variables

Stunting is a condition characterized by a Z-score less than -2 SD for the ratio of height to age or the ratio of body length to age following Child Growth Standards.

The first antenatal visit (K1) is the first time pregnant women come into touch with skilled healthcare professionals, allowing them to get standardized, integrated, and comprehensive services.

The fourth antenatal visit (K4) is a minimum of four or more interactions between pregnant women with skilled health professionals, to get integrated and all-inclusive treatments that meet standards.

The sixth antenatal visit (K6) is a minimum of six or more interactions between pregnant women with skilled health professionals, to get integrated and all-inclusive treatments that meet standards.

5. Study Instruments

The data in this study fully uses secondary data obtained through data from the Margadadi Health Center to see stunting conditions in toddlers as well as MCH books owned by mothers who have toddlers to see the scope of antenatal visits.

6. Data Analysis

Univariate analysis of the data was utilized in this study to reveal the distribution of the research variables and the characteristics of the subjects. This research also included a bivariate analysis using the Chi-square test to find the relationship between independent and dependent variables. This relationship was then evaluated using estimates for the p-value, odds ratio (OR), and 95% confidence interval (CI).

7. Research Ethics

This research has gone through a review process by the Health Research Ethics Commission of the Faculty of Medicine, National Development University "Veteran" Jakarta with number: 461/XII/2022/KEPK and was declared feasible on December 9, 2022.

RESULTS

1. Sample Characteristics

The gender and age of the toddlers were the respondent's characteristics examined in this research. The age criteria range from 0 to 59 months and are classified into five groups, while the sexes are classified as female and male (Table 1).

Table 1. Characteristics of children

Variable	Frequency (n)	Percentage (%)
Children Age (Month)		
0 – 12 Months	6	10
13 – 24 Months	11	18.3
25 – 36 Months	18	30
37 – 48 Months	18	30
49 – 60 Months	7	11.7
Children sex		
Female	30	50
Male	30	50

Table 1 shows that most of the subjects are aged 25– 36 months with 18 subjects (30%) and 37 – 48 months old with 18 subjects (30%). Table 1 also shows that subjects have the same sex distribution as 30 subjects are female and 30 subjects are male.

2. Univariate Analysis

In the univariate analysis, a description of the stunting incidents in the Margadadi Health Center's work area was analyzed (Table 2).

Table 2. Overview of stunting events and ANC visit

Variables	Frequency (n)	Percentage (%)
Stunting		
Yes	30	50
No	30	50
K1		
Yes	60	100
No	0	0
K4		
Yes	58	96.7
No	2	3.3
K6		
Yes	50	83.3
No	10	16.7

Table 2 shows that toddlers with stunting conditions were 30 subjects (50%) as a case group and those who did not experience stunting were 30 subjects (50%) as a control group. In the univariate analysis, a description of the first antenatal visit (K1), the fourth antenatal visit (K4), and the sixth antenatal visit (K6) in the Margadadi Health Center's operating region was also analyzed (Table 3). Based on table 3 showw that the all 60 subjects (100 %) had made the first antenatal visit. Furthermore, in the description of the fourth antenatal visit, it can be seen that the most of subjects who have carried out the fourth antenatal visit are 58 subjects (96.7 %) and those who did not carry out the fourth antenatal visit were 2 subjects (3.3 %). Finally, in the description

of the sixth antenatal visit, it can be stated that the most of subjects who have carried out the fourth antenatal visit are 50 subjects (83.3 %) and those who did not carry out the sixth antenatal visit are 10 subjects (16.7 %).

3. Bivariate Analysis

The association between K1, K4, and K6 and the prevalence of stunting was examined in the bivariate analysis (Table 3). However, in the analysis of the relationship between K1, K4, and K6 with stunting incidence, no statistical results were obtained for the variables K1 and K4. Therefore, these results are not presented in Table 3. The absence of statistical results between K1 and K4 is due to: (1) K1 is a constant variable, where all respondents (100%) attended the K1 visit, so there is no comparable variation in the data. Therefore, an Odds Ratio or other statistical test could not be calculated; and (2) Second, K4 also showed no significant variation, as almost all respondents (98.3%) attended the K4 visit, with only one respondent not attending. This condition causes the OR calculation to produce a value of 1.000 without a confidence interval or p-value, as the data distribution is too balanced or too small for meaningful analysis.

In contrast to K6, the results of the statistical test showed that the K6 examination has a statistically significant protective relationship against stunting events (OR= 0.20; 95% CI = 0.04–1.02; p= 0.038).

Table 3. The relationship between K6 and stunting

K6 ANC visit	Stunting						OR	95% CI	p
	Yes		No		Total				
	N	%	N	%	N	%			
Yes	22	44	28	56	50	100	0.20	0.04 – 1.02	0.038
No	8	80	2	20	10	100			

DISCUSSION

The accuracy of pregnant women in making antenatal visits is influenced by several factors. These factors consist of predis-posing factors, enabling factors (enabling), and need factors (Alibhai et al., 2022). Predisposing factors are factors that give a predisposition to disease or can also be defined as factors that facilitate behavior change. Predisposing factors consist of age, education level, employment status, parity rate, pregnancy distance, knowledge of pregnant women, and attitudes toward pregnant women (Rachmawati et al., 2017).

Furthermore, there is an enabling factor that can be interpreted as resources that could assist access to services. Enabling factors consist of socioeconomic status, mileage, transportation, quality of antenatal visits, and healthcare facilities. Finally, there are factors of need, namely factors that repre-ssent the potential needs for the use of health services (Li et al., 2016). The rein-forcing factor in antenatal visits is parity conditions. In addition to these three factors, antenatal visits can be caused by other factors, including husband support, family support, unwanted pregnancy, using traditional healers, and others.

Based on the findings of the researcher's research, respondents in this study have all made the first antenatal visit (K1) with a total of 60 respondents (100%). This is not in line with the data in one of the studies related to (Hamid et al., 2021) because in the study it was found that as many as 52.9% of respondents did not carry out the first antenatal visit. The results of this study are also not in line with research related to (Hutasoit et al., 2020) because in

the study it was found that 46% of respondents did not meet antenatal visits. The difference from some of the studies above can be caused by several things because several factors influence pregnant women in carrying out antenatal visits. One of the factors that can influence pregnant women in carrying out antenatal visits is the distance from home to the place of health services (Ali et al., 2018) where the increase in distance from health services will reduce the implementation of health services.

When collecting data, researchers pay attention to the location of the Integrated Services Post (posyandu) which is usually used to carry out antenatal visits in each area. The location of the Integrated Services Post located in each area looks quite close so that access for pregnant women who want to carry out antenatal visits is quite easy. This study indicates that the conditions for the first antenatal visit in the Margadadi Health Center's work area are very good because the first antenatal visit to all respondents is already running. This condition should be maintained so that the quality of pregnancy for pregnant women in the Margadadi Health Center's work area is maintained properly.

Furthermore, from the results of research that has been done by researchers, respondents in this study have all made a fourth antenatal visit (K4) with a total of 58 respondents (96.7%) carrying out K4 and 2 respondents (3.3%) not implementing K4. This is not in line with the data in one of the related studies conducted by (Hamid et al., 2021), but it is close to the results of this study because in the study it was found that K4 coverage at the Lau Health Center was 94.7% of respondents had carried out the first antenatal visit. Based on the percentage recorded, there is a decrease in the percentage from K1 to K4. This decrease can be caused by many factors as previously described.

The research conducted by (Ali et al., 2018) mentioned that the quality of antenatal services affects the frequency of antenatal visits. The effectiveness of employees or health professionals and facilities from health services may be used to determine the quality of antenatal care. If the quality of antenatal service during the first visit is not as good as the expectations of pregnant women, it can cause a decrease in the frequency of antenatal visits. This study indicates that the conditions for the fourth antenatal visit in the working area of the Margadadi Health Center are good but not better than the description of the first antenatal visit. We recommend that this condition must be further improved so that K4 coverage can reach 100% as in K1 coverage so that the condition of pregnant women can always be monitored from the initial trimester to the final trimester.

Finally, from the findings of the study that was done by researchers, respondents in this study who have made a sixth antenatal visit (K6) with a total of 50 respondents (83.3 %) carrying out K6 and 10 respondents (16.7 %) not carrying out K6. This is in line with research conducted by (Dewanggayastuti et al., 2022) which illustrates that the coverage of the sixth antenatal visit has the lowest percentage compared to the first and fourth antenatal visits with a figure of 30.2%. Therefore, it can be concluded that the awareness of pregnant women in carrying out the sixth antenatal visit is still not good.

According to research conducted by researchers and previous studies, it can be seen that the percentage of K6 is the lowest compared to K1 and K4. This can occur due to a lack of knowledge from pregnant women regarding the latest antenatal visit recommendations from the Ministry of Health which recommends carrying out

antenatal visits at least 6 times or recommendations from the WHO to carry out antenatal visits at least 8 times.

In the research by Rachmawati et al. (2017), it was stated that knowledge is an important factor that makes pregnant women want to make antenatal visits because it shows how likely a person is to do something. Pregnant women should be able to know a lot about pregnancy health as well as antenatal visits. This study indicates that the conditions for the sixth antenatal visit in the Margadadi Health Center working area are quite good but not better than the description of the first antenatal visit and the fourth antenatal visit. This condition should be further improved because the latest directives from the Ministry of Health of the Republic of Indonesia state that antenatal visits are carried out at least 6 times. Therefore, the Margadadi Health Center should provide insight related to the direction of antenatal visits to pregnant women so that the scope of the sixth antenatal visit in the Margadadi Puskesmas work area can be better fulfilled.

The bivariate analysis used in this study was the Chi-Square test. Based on the statistical test, the relationship of the first antenatal visit (K1) to stunting cannot be carried out. This happened because all respondents from this study had carried out K1 which indicates that the independent variables in this bivariate analysis are constant so the Chi-Square test cannot be carried out. This result is not in line with the results of research from (Hutasoit et al., 2020) because in the study the results were obtained that there is a relationship between antenatal care and the incidence of stunting in the work area of the Kalibawang Kulonprogo Health Center with a p-value of <0.001 and an r-value of 0.39, which means it has a moderate relationship. In another study conducted by (Hapsari et al., 2022), it was also stated that there was a significant relationship between ANC visits to stunting incidence in Batu City with a p-value of 0.0140. In addition to these two studies, results were obtained in line with the research done by (Mujahidah, 2021) which explained that there was no significant relationship between antenatal care and a p-value of 0.821. This difference can occur likely becausse there are some differences in the quality of antenatal visits in each region so it can affect the relationship between antenatal visits and stunting events. In addition, this can occur due to other causes that influence the occurrence of stunting, such as direct causes, namely nutritional intake and infection, or other indirect causes such as environmental sanitation, socio-economic conditions, maternal knowledge, and others (Beal et al., 2018).

In this study, the results of a bivariate analysis of the relationship between the fourth antenatal visit and the stunting event obtained a p result of 1,000, which means that statistically there was no significance or significant relationship between the antenatal fourth visit and the stunting event. The results of this study are in line with the results of research from (Ramadhini et al., 2021) because in the study a p-value of 0.325 was obtained which indicates that there is no meaningful relationship between complete antenatal visits (K4) and stunting events. In contrast to other related studies, a study by (Camelia et al., 2020) examined the quantity of antenatal visits with stunting events. In the study, a p-value of 0.003 was obtained, which means thats there is a significant or meaningful relationship between the quantity of antenatal visits (K4) and the incidence of stunting. Therefore, some of the studies above indicate that there are still differences in results related to the relationship between K4 and stunting incidence. This can happen because other factors affect stunting. This

can also happen because over time it requires more antenatal visits that can affect the nutritional status of the fetus that will grow into a toddler, one of which is stunting. This is reflected in the latest recommendation from the Ministry of Health which was only issued in 2021 with a recommendation of at least six different antenatal visits in the previous recommendations recommended to make antenatal visits at least four times.

The outcomes of the bivariate analysis using the Chi-Square test for the sixth antenatal visit with stunting condition obtained a p-value of 0.038 which indicates that statistically there is a meaningful relationship between the sixth antenatal visit and stunting event. In these results, no research was found that was in line because there was no research that used K6 as an independent variable to determine the relationship between antenatal visits and stunting events.

However, from these results, it can be concluded that to be able to supervise and maintain the nutritional condition of the fetus which can affect it until it grows into a toddler is to carry out K6. The sixth antenatal end is carried out in the third trimester, namely in the 24th - 40th week 3 times. According to research conducted by Gaillard et al. (2014) at the time of the third trimester, it was found that fetal growth characteristics are often associated with premature birth and low birth weight. In another study, by Ernawati et al. (2018) stated that the examination of nutritional status in the third trimester has a strong correlation with the weight of the fetus at birth.

Furthermore, in the study by Kumendong et al. (2015) indicated that there is a connection between the quantity of antenatal visits and birth weight, indicating that pregnant women who don't attend enough prenatal sessions run the risk of giving birth to babies with low birth weight (LBW).

A study conducted by Aryastami et al. (2017) stated that a low birth weight (LBW) newborn is more likely to experience stunting. Not only this study, the research conducted by (Putri et al., 2020) also stated that children who experience LBW are 4.24 times more at risk zof experiencing stunting conditions. The relationship between LBW and stunting conditions can be caused because toddlers who experience LBW will have digestive problems, namely difficulty absorbing fat and digesting protein. As a result, the body lacks spare nutrients, which, if left untreated, can result in nutritional problems over a long time and stunting conditions occur (Putri et al., 2021). Therefore, it can be concluded that the sixth antenatal visit is related to stunting by monitoring growth as well as nutrition in the fetus itself.

AUTHORS CONTRIBUTION

Najma Zahirah fully contributed to the data collection, data analysis, and article production. Nunuk Nugrohowati, Andri Pramesyanti Pramono, and Fachri Razi contributed to the research idea's initial conception and became advisors by providing advice in research and drafting articles.

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CONFLICT OF INTEREST

There are no conflicts of interest.

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