

## **The Relationship Between Public Health Center Service Coverage and Stunting in Children Aged <59 Months in Malang Regency**

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### **ABSTRACTS**

According to WHO, public health problems can be considered chronic if the prevalence of stunting is more than 20%, meaning that stunting is a serious health problem in Indonesia. East Java is a province with a high prevalence of under-five and stunted nutritional status, which is 30%-<40%. The Malang Regency is one of 100 priority district/city interventions. To help reduce stunting, the Puskesmas unites the growth and development of children under five and provides care to pregnant women. The purpose of this study was to determine whether there were among the puskesmas programs which included the provision of Vitamin A, the provision of blood-added tablets and the provision of additional food to pregnant women with chronic energy deficiency conditions with the incidence of stunting in Malang Regency. This research is an analytical survey research using secondary data from the Malang District Health Office. The type of sample used was purposive sampling, namely by selecting the Puskesmas with the highest stunting cases (close to 20% or more) so that 10 Public Health Center were obtained as samples and research sites. The results of the analysis showed that there was no relationship between the administration of blood-boosting tablets and the provision of additional food to pregnant women with chronic energy deficiency conditions with the incidence of stunting in Malang Regency. The importance of conducting further research on the causes of stunting in Malang Regency, caused by stunting is a complex factor, involving various factors.

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## 1. Introduction

According to the World Health Organization (WHO), stunting is a developmental problem in children caused by poor diet, repeated illnesses, and insufficient psychosocial stimulation. Stunting is defined as a kid's height exceeding the WHO standard deviation of -2 for child growth and development. In Indonesia, the high incidence of stunting is a serious public health problem (1,2)

The prevalence of stunting in Indonesia based on the results of the 2016 Nutritional Status Monitoring (PSG) reached 27.5 percent (3). According to WHO, public health problems can be considered chronic if the prevalence of stunting is more than 20 percent (4). This eventuality means that nationally the stunting problem in Indonesia is chronic, especially in 14 provinces where the prevalence exceeds the national figure. East Java is a province with a high prevalence of short and very short toddlers' nutritional status, namely 30%-<40%. The Malang Regency is one of the 100 priority regions/cities for intervention. Data from the Malang District Health Office in 2019 stated that there were 10 of Public Health Center in Malang Regency with stunting percentage approaching 20% or more are Wonosari Public Health Center (31.5%), Dau Public Health Center (29.6%), Pujon Public Health Center (27.8%), Gondanglegi Public Health Center (26.5%), Ngajum Public Health Center (24.6%), Dampit Public Health Center (24%), Sumberpucung Public Health Center (23%), Tirtoyudo Public Health Center (23%), Sumbermanjing Kulon Public Health Center (20.4%) and Tajinan Public Health Center (19.5%). Based on these data, the 10 health centers were chosen to be research sites

Malnutrition can cause developmental delays, especially during the first 1000 days of life. One way to prevent growth retardation is to provide nutrition and health services to pregnant women. Considering that growth retardation affects the intelligence level of children and the health of adults, these efforts are necessary. The consequences of malnutrition in 1000 HPK are permanent and difficult to treat (5).

An effort to Prevent nutrition and health problems in pregnant women and children under the age of 5 is a long-term investment for future generations. The government has launched a program to reduce stunting cases by 14% by 2024. It is certainly a big challenge for the government and the people of Indonesia. In addition, the activities of the health center are currently not ideal. In fact, the Health Center is the most important pillar in monitoring the growth and development of babies in their working areas. To help reduce developmental retardation, the Health Center monitor the growth and development of children under five, including weighing, measuring, and filling out the Card Toward Health. Administration of Vitamin Capsules, the provision of additional food for pregnant women with chronic energy deficiency, nutritional education for mothers under the age of 5 years and the provision of blood-added tablets to prevent and treat anemia in pregnant women (6).

It is important to give vitamin A to children at the age of 6-59 months. Vitamin A deficiency can reduce the production of bone matrix by osteoblasts, which interferes with the remodeling process and prevents bone formation. Disruption of bone formation leads to impaired growth (7). In addition, Aditi S Hombali (2019) found in his research that a diet rich in vitamin A, especially in the form of carotenoids, can promote growth and improve recovery from stunting in malnourished children (8). What's more, vitamin A supplementation can reduce infection rates in children, especially diarrhea and acute respiratory infections that often occur in children. The low incidence of disease reduces the risk of stunting because healthy children can grow without a hindrance. For children who are often sickly, the food intake obtained is used during the healing process. Children who are often sick also have a higher need for nutrients, but their

ability to absorb them also decreases. This event can cause stunting if the child has been sick for a long time and does not eat enough food for the healing process after illness (6) (9).

Another aspect observed in this study was the administration of iron tablets to pregnant women and the provision of additional food for pregnant women with chronic energy deficiency. Chronic energy deficiency is a pregnant woman with a weight of 45 kilograms and an upper arm circumference of only 23.50 centimeters. Pregnant women with chronic energy deficiency are at risk of giving birth to stunted children due to poor nutrition. The micronutrient that is closely related to growth retardation is iron. The results of research by Enggar Kartika Dewi and Triska Susila Nindya (2017) (10) show that there is a significant relationship between iron adequacy and the development of growth retardation.

Based on the above problems, the researcher wants to look into the relationship between vitamin A supplementation, blood-added tablets, and supplementary feeding for pregnant women with chronic energy deficiency and the incidence of stunting in children under the age of five in the Malang District Health Office in East Java, Indonesia. It is envisaged that the research will result in publications that will serve as scientific references for the government as it develops policies for preventing and responding to stunting incidents in Indonesia, particularly in the Malang Regency of the East Java province.

## 2. Materials and Methods

This study is based on second-hand data about maternal and child service data in 2019 from the Malang District Health Office and is an analytical survey study. Analytical surveys are studies that look at the causes and effects of health problems. This study used a cross sectional survey method, which is a research method that examines the dynamics of the relationship between risk factors and effects by collecting data all at once (point at approach).

Purposive sampling was utilized, which involved picking the Public Health Center with the greatest stunting cases (near to 20% or more) in the Malang District Health Office area, as well as the highest stunting incidence in the Malang District Health Office region. Wonosari Public Health Center, Dau Public Health Center, and Pujon Public Health Center were among the ten Public Health Centers that were chosen, Gondanglegi Public Health Center, Ngajum Public Health Center, Dampit Public Health Center, Sumberpucung Public Health Center, Tirtoyudo Public Health Center, Sumbermanjing Kulon Public Health Center, and Tajinan Public Health Center were among the 10 Public Health Centers that were chosen. The Spearman Rank Correlation test was employed in this study's data analysis as a non-parametric test.

## 3. Results and Discussion

Tabel 1-5 shows the findings of data processing in this research.

**Table 1.** Stunting percentages in Malang Regency, 2019

No	Public Health Center's Name	The children under the age of five (<59 months)	Stunting	% Stunting
1	Wonosari	260	82	31,5%
2	Dau	1732	513	29,6%
3	Pujon	1599	445	27,8%
4	Gondanglegi	1148	304	26,5%
5	Ngajum	1525	375	24,6%
6	Dampit	913	219	24,0%
7	Sumberpucung	1330	306	23,0%

No	Public Health Center's Name	The children under the age of five (<59 months)	Stunting	% Stunting
8	Tirtoyudo	1024	236	23,0%
9	Sumbermanjing Kulon	387	79	20,4%
10	Tajinan	1575	307	19,5%

Source: Malang District Health Office data, 2019

Table 1 demonstrates that the Wonosari Health Center's work area has the highest prevalence of stunting in children aged 59 months, at 31.5 percent.

**Table 2.** Vitamin A coverage in Malang Regency's Health Center Region, 2019

No	Public Health Center's Name	The children between the ages of 6 and 11 months	The children between the ages of 12 and 59 months
1	Wonosari	43%	67%
2	Dau	92%	89%
3	Pujon	85%	115%
4	Gondanglegi	115%	106%
5	Ngajum	102%	111%
6	Dampit	95%	95%
7	Sumberpucung	89%	87%
8	Tirtoyudo	92%	92%
9	Sumbermanjing Kulon	100%	98%
10	Tajinan	100%	109%

Source: Malang District Health Office data, 2019

Table 2 demonstrates that the Pujon Health Center region has the highest coverage of vitamin A administration in Malang Regency in 2019, while the Wonosari Health Center work area has the lowest coverage of vitamin A administration.

**Table 3.** The coverage of the provision of blood-added tablets for pregnant women in Malang Regency's Public Health Center Region, 2019

No	Public Health Center's Name	The coverage of the provision of blood-added tablets
1	Wonosari	90,6%
2	Dau	100,7%
3	Pujon	97,6%
4	Gondanglegi	96,1%
5	Ngajum	99,5%
6	Dampit	98,8%
7	Sumberpucung	99,4%
8	Tirtoyudo	93,6%
9	Sumbermanjing Kulon	104,1%
10	Tajinan	100,4%

Source: Malang District Health Office data, 2019

Table 3 shows the highest coverage of giving blood-added tablets is in the Sumbermanjing Kulon Health Center area, while the lowest coverage is in the Tirtoyudo Health Center area.

**Table 4.** Supplementary feeding coverage at the Malang Regency's Public Health Center Region for pregnant women with chronic energy insufficiency, 2019

No	Name of Health Center	Coverage of Supplementary feeding for pregnant women with chronic energy deficiency
1	Wonosari	65,0%
2	Dau	100,0%
3	Pujon	49,7%
4	Gondanglegi	100,0%
5	Ngajum	25,0%
6	Dampit	100,0%
7	Sumberpucung	100,0%
8	Tirtoyudo	100,0%
9	Sumbermanjing Kulon	100,0%
10	Tajinan	50,0%

Source: Malang District Health Office data, 2019

The additional food coverage that has met the target in the Dau Health Center, Gondanglegi Health Center, Dampit Health Center, Sumberpucung Health Center, Tirtoyudo Health Center, and Sumbermanjing Kulon Health Center areas is shown in Table 4, with the Ngajum Health Center region having the least coverage.

**Table 5.** The relationship between public health center service coverage and stunting in Malang Regency, 2019

Public Health Center service coverage	Average Care Coverage Percentage (min-max)	Correlation Coefficient	p-value
The coverage of Vitamin A (6-11 months)	92,8 (43-115)	-0,509	0,133
The coverage of Vitamin A administration (11-59 months)	96,9 (67-115)	-0,201	0,578
the coverage of the provision of blood-added tablets	98,1 (90,6 – 104,1)	-0,432	0,213
The coverage of supplementary feeding for pregnant women	78, 9 (25,0 – 100,0)	-0,171	0,636

All factors have a p-value greater than 0.05, as shown in Table 5. In Malang Regency, there is no link between the provision of Vitamin A, the provision of blood-added tablets, or the Coverage of supplementary feeding for pregnant women with chronic energy insufficiency and the occurrence of stunting in children under the age of five.

Malang Regency is one of the 100 high-priority stunting intervention areas in Indonesia. The results of the survey showed that 8 of the 10 public health centers in the Malang Regency have a prevalence rate of stunting that is higher than the national average of 20.8% . Growth failure before the age of two is a critical and irreversible period, after which growth failure cannot be corrected. Stunting has an impact on more than just physical growth opportunities. Children with developmental delays may experience cognitive decline, which affects work

efficiency and leads to low incomes.

Stunting is caused by a variety of causes, including insufficient mother nutritional intake during her pregnancy, incorrect exclusive breastfeeding techniques, and the supply of low-quality and quantity feeding practices to children that do not meet their nutritional needs (11,12). The government works hard to prevent stunting by developing numerous intervention programs to address nutritional issues that have been in place since the mother was pregnant. Pregnant women were given blood-added tablets and Supplementary feeding for pregnant women with chronic energy insufficiency as part of the interventions (13).

### 3.1. Vitamin A

In Indonesia, vitamin A deficiency is one of the determinants of nutritional disorders. The findings revealed that vitamin A administration coverage for children under the age of five in Malang Regency was quite strong, with 92.8 percent and 96.9 percent coverage in the age groups of 6-11 months and 12-59 months, respectively. This figure is higher than East Java Province's coverage, which was 94.8 percent in 2019. However, there are some regions, such as the Wonosari area, where coverage is at least 80%. It can be seen from the data that numerous places have a coverage rate of greater than 100%. Supplementation, which is also provided to youngsters who have not been enrolled at the Public Health Center is thought to be the cause.

Vitamin A supplementation is recommended in areas with a high prevalence of vitamin A deficiency, which can be identified by measuring serum retinol levels. If there are as many as 15% of the serum retinol levels in children under five years of age  $<20\mu\text{g/dL}$  in a region, there is a vitamin A problem in that region (2). The prevalence of vitamin A deficiency in Indonesia is improving. The latest VAC prevalence obtained from seven provinces in Indonesia was 11.4% (14).

Given the high frequency of stunting in Indonesia, vitamin A deficiency is still a nutritional problem. This is because children who are stunted have a higher frequency of vitamin A deficiency (2). Vitamin A is assumed to be responsible for the link between Vitamin A deficiency and growth failure because it maintains the function and structure of mucosal epithelial cells, particularly those in the gastrointestinal tract. Vitamin A deficiency can cause these structures to be disrupted, increasing the risk of infectious disease exposure and inhibiting the growth (15). For children aged 6 months to 59 months, recommendations for vitamin A supplementation are made.

### 3.2. Blood-added tablets

Pregnant mothers are given blood-added tablets as part of one of the government's stunting prevention programs. Giving blood-added tablets is done from the beginning of the pregnancy until the baby is born, with a minimum of 90 tablets ingested (16). According to the findings of the study, the coverage of administering blood pills in Malang Regency was greater than 90%. This number is already higher than the national coverage rate of 73.2% (3). However, there is no information indicating whether pregnant women receive 90 grains of pills. According to Basic Health Research in 2018, only 24% of pregnant women received 90 pills out of 73.2% of the coverage, and only 38.1% of pregnant women ingested 90 blood-added tablets (17).

Blood pills are given to pregnant women to prevent the formation of iron deficiency anemia. However, negative effects from blood-added tablets consumption, such as nausea or a change in stool color to black, cause pregnant women's adherence to be very low. This can be

avoided by following the instructions for taking iron tablets, which include taking it at night before going to bed, eating it with vitamin C-rich foods, and not taking it with milk, tea, coffee, or stomach ulcer medicine (17)

### 3.3. Supplementary feeding for pregnant women with chronic energy insufficiency

Pregnant women with chronic energy deficiency whom have an upper arm circumference of less than 23.5 cm are offered supplemental feeding According to the survey results, as many as four pustular sites provide 100% supplementary feeding for pregnant women. Supplementary feeding for pregnant women coverage was 65 percent, 49.7%, 25%, and 50 percent in the Wonosari, Pujon, Ngajum, and Tajinan areas, respectively. This coverage is adequate to describe Indonesia's coverage of Supplementary feeding for pregnant women with chronic energy insufficiency, which is 25.2 percent (18).

The results obtained did not indicate an increase in the amount of food consumed by pregnant women. According to the 2018 Basic Health Research statistics, only 2.1% of pregnant women consumed 90 packs of supplementary feeding for pregnant women with chronic energy insufficiency (3). The unequal distribution of increased food coverage and misuse are the causes of low consumption. Consumption with low coverage of additional food has no effect on maternal weight gain or fetal growth during pregnancy (19).

### 3.4. The relationship between public health center service coverage and stunting in Malang Regency, 2019

Factors that analyze the administration of vitamin A, the administration of blood-added tablets, and the administration of supplementary feeding for pregnant women with chronic energy insufficiency. Among all the factors analyzed, there is no variable that relation with stunting Malang Regency ( $p > 0.05$ ). This is because the factors analyzed are supporting factors for stunting prevention. Stunting is directly influenced by the nutritional status and health of the mother during pregnancy, exclusive breastfeeding, and child feeding practices, as well as good hygiene and sanitation practices (20).

The results showed that the majority of Public Health Center areas had a good level of coverage, but there were some areas that had a low percentage of coverage, including Wonosari, Pujon, Ngajum, and Tajinan areas. The low coverage is thought to be due to the uneven distribution of additional food in the area, so that the effect of giving PMT on the weight gain of pregnant women and child development cannot be known. For data on the coverage of iron tablets, although almost all regions already have a very good level of coverage, it is not yet known the level of consumption and the amount of iron tablets received by pregnant women. Research data also do not show anemia status in mothers because mothers who suffer from anemia and do not take iron tablets regularly have a higher risk of giving birth to stunted children (21). Supplementary food will not have a significant effect on increasing maternal weight during her pregnancy and child development if the level of adherence to consumption is low and the monitoring method is not good (22).

The start of the supplement should be determined and implemented as soon as possible. Better linear growth can be achieved by supplementing as soon as possible. Since the faster the intake of iron supplements, the lower the incidence of stunting(23). It is important to know when to start taking iron supplements to pregnant women. According to the results of laboratory investigations on experimental animals, different supplementation time will affect the birth size, placenta size and endocrine development response (24).

#### 4. Conclusions

WHO has determined that the prevalence of stunting in an area is more than 20% as a serious health problem. Malang Regency is one of regencies/cities prioritized by the government to reduce stunting rates. There are 10 Public Health Centers that have a stunting prevalence that is close to 20% or more. Public Health Centers is a place for monitoring the growth and development of children and the health of pregnant women have a very important role. In an effort to tackle stunting, the Public Health Centers has programs including the provision of vitamin A for children age 6-11 months and children aged 12-59 months, giving blood-added tablets for pregnant women and supplementary feeding for pregnant women with chronic energy insufficiency. The results showed that there was no relationship between the coverage of these programs and stunting in children aged less than 59 months in Malang Regency. Further research on the factors causing stunting is important because the causes of stunting are complex factor, involving many factors.

#### 5. Acknowledgment

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