FACTORS AFFECTING STUNTING AMONG CHILDREN UNDER FIVE YEARS OF AGE IN BANYUWANGI, EAST JAVA

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ABSTRACT

Background: Stunting, chronic malnutrition, results from the exposure of the fetus and young child to nutritional deficiency and infectious disease. In Indonesia, 30.8% of children were stunted, in which 26.2% was in East Java and 8.1% Banyuwangi Regency. This study aimed to investigate the factors affecting stunting among children under five years of age in Banyuwangi, East Java.

Subjects and Method: This was a cross-sectional study conducted at Klatak and Wonosobo Community Health Centers, Central Java. A sample of 60 children under five years of age was selected for this study. The study variables were child's gender, maternal age at pregnancy, maternal education, maternal work status, iron intake, history of chronic energy deficiency, exclusive breastfeeding, supplementary feeding, and history of infectious disease. The frequency distribution data were reported descriptively.

Results: The majority of stunted children under study were male (53.3%). Most of the women were at age 20 to 34 years during pregnancy (58.3%). As many as 73.3% mothers were low educated. Most of the mothers were housewives (85%). 78.3% of women took iron supplement during pregnancy. Most of the children did not have the history of chronic energy deficiency (60%). Most of the children received exclusive breastfeeding (61.7%) and supplementary feeding (65%). Only a few children had the history of infectious disease (6.7%).

Conclusion: The characteristics of subjects under study vary with maternal age at pregnancy, maternal education, maternal work status, iron intake, history of chronic energy deficiency, exclusive breastfeeding, supplementary feeding, and history of infectious disease.

Keywords: stunting, children under five years of age, factors

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BACKGROUND

Reducing the stunting rate is one of the Sustainable Development Goals (SDGs) targets in the second sustainable development goal. The target set in the SDGs is that by 2025 the incidence of stunting will decrease to 40%. Stunting is a problem because it can increase the risk of developing diseases in adulthood, stunted motor development, and mental growth (UNICEF 2013; Bappenas, 2013).

In 2017, 22.2% of children under five in the world were stunted. In East Java, in 2017, stunting reached 26.2%, while in Banyuwangi Regency, stunting was 8.1%.

Stunting is an accumulative process that occurs from pregnancy, childhood, and throughout the life cycle. Therefore, stunting is a multifactorial event. Some of the direct causes of stunting are chronic malnutrition and improper parenting. Stunting adverse impacts on development such as cognitive abilities, prone to
sickness, and have low competitiveness. Several risk factors are also associated with stunting, including poor environmental sanitation, low birth weight babies (LBW), exclusive breastfeeding, inappropriate timing, and composition of complementary foods (Nadiyah et al., 2014; Paramashanti et al., 2016; Kashanah et al., 2016).

The first thousand days of life of a child, starting from pregnancy until the child is 2 years old, is critical to determine his future. In this period, a child must get proper care, one of which is the fulfillment of nutrition to avoid severe growth disorders. If appropriate is more than 1000 days past, then the adverse effects of malnutrition are challenging to treat.

The central and local governments have made various efforts to reduce the incidence of stunting at all ages. Based on the Minister of Health Regulation Number 39 of 2016, interventions that can be carried out include integrated Antenatal Care (ANC), monitoring of toddler growth, provision of Supplementary Food, reproductive health education for adolescents as well as hygiene counseling, balanced nutrition, and detection of infectious and not contagious in young adults.

Among these interventions, which is no less important and must be the main concern is the period of the first 1000 days of life, which is a common thread that is the beginning of stunting, will become a long-term and recurring impact in the life cycle (Aryastami, 2017). This study aimed to determine the factors contributing to childhood stunting aged 25-60 months in Banyuwangi Regency.

**SUBJECTS AND METHOD**

1. **Study Design**
   This was a cross-sectional study conducted at Klatak and Wonosobo Community Health Centers, Central Java.

2. **Population and Sample**
   This study's population were stunted toddlers aged 25-60 months in the working area of Puskesmas Klata and Puskesmas Wonosobo. A sample of 60 children under five years of age was selected for this study using the Proportional Random Sampling technique.

3. **Study Variables**
   The study variables were child's gender, maternal age at pregnancy, maternal education, maternal work status, iron intake, history of chronic energy deficiency, exclusive breastfeeding, supplementary feeding, and history of infectious disease.

4. **Study Instruments**
   Data were collected using questionnaires, interview guides, and checklists.

5. **Data Analysis**
   The frequency distribution data were reported descriptively.

**RESULTS**

This study described the sample characteristics, including age, education, occupation, maternal parity, a maternal condition during pregnancy, breastfeeding history, nutrition, and infectious diseases suffered from the children.

Table 1 showed that most of the children under five who suffer from stunting were male (53%). More than half of the study subjects were mothers of stunting children aged 20-34 years (58.3%). Most mothers with stunting children had a low level of education (73.3%). Almost all study subjects who had stunted children under five were housewives (85%). Most mothers who had stunted children under five and consumed iron (Fe) tablets regularly during pregnancy were 78.3%.

More than half of mothers with stunted children did not experience Chronic Energy Deficiency during pregnancy (60%). More than half of stunting children receiv-
ed exclusive breastfeeding (61.7%), and did not get proper complementary breastfeeding during the first 2 years (65%). A small proportion of children under five were stunted with a history of infectious diseases (6.7%).

**Table 1. Sample Characteristics (categorical data)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>28</td>
<td>46.7%</td>
</tr>
<tr>
<td>Boys</td>
<td>32</td>
<td>53.3%</td>
</tr>
<tr>
<td>Maternal Age at Pregnancy (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>10</td>
<td>16.7%</td>
</tr>
<tr>
<td>20-34</td>
<td>35</td>
<td>58.3%</td>
</tr>
<tr>
<td>≥35</td>
<td>15</td>
<td>25%</td>
</tr>
<tr>
<td>Maternal Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>44</td>
<td>73.3%</td>
</tr>
<tr>
<td>High</td>
<td>16</td>
<td>26.7%</td>
</tr>
<tr>
<td>Maternal Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housewives</td>
<td>51</td>
<td>85%</td>
</tr>
<tr>
<td>Work Outside</td>
<td>9</td>
<td>15%</td>
</tr>
<tr>
<td>Iron Consumption during Pregnancy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>47</td>
<td>78.3%</td>
</tr>
<tr>
<td>No</td>
<td>13</td>
<td>21.7%</td>
</tr>
<tr>
<td>History of Malnutrition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>24</td>
<td>40%</td>
</tr>
<tr>
<td>No</td>
<td>36</td>
<td>60%</td>
</tr>
<tr>
<td>Exclusive Breastfeeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>37</td>
<td>61.7%</td>
</tr>
<tr>
<td>No</td>
<td>23</td>
<td>38.3%</td>
</tr>
<tr>
<td>Proper Feeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>21</td>
<td>35%</td>
</tr>
<tr>
<td>No</td>
<td>39</td>
<td>65%</td>
</tr>
<tr>
<td>Infectious Disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4</td>
<td>6.7%</td>
</tr>
<tr>
<td>No</td>
<td>56</td>
<td>93.3%</td>
</tr>
</tbody>
</table>

**DISCUSSION**

The results showed that the proportion of children under five with stunting was mostly found in male children. This was in line with the study conducted by Anisa (2012) stated that there was a relationship between sex and the incidence of childhood stunting (aged 6-23 months). The chances of being stunted in male children were 2.441 times higher than to female, and it was statistically significant (OR= 2.441; p= 0.043).

Almatsier (2004) stated that women have more fat tissue and less muscle tissue than men. Metabolically, muscle is more active than fat, so that proportionally muscle, will require energy than fat. Even though weight, age, and metabolic needs are different, their needs life and nutrition will also differ.

Soekardi et al. (2019) stated that the tendency for male children to experience stunting was 24 people (53.3%). So that boys were more likely to experience stunting if supported by other risk factors for stunting. The trend of stunting cases in male toddlers in the study was that boys tended to have higher physical activity than girls.

This study showed 58.3% of maternal age was in the age range 20-34 years. This age range is a safe age in reproduction and...
the reproductive period. Jiang et al. (2014) stated that the birth of a stunted child in a pregnant mother at the age of more than 35 years has a 2.74 times risk compared to a mother who gave birth at the age of 25-35 years.

Fajrina (2016) study showed the relationship between maternal age at pregnancy and the incidence of stunting. Cunningham (2006) also stated that the age of 20-35 is the proper reproductive age for a woman. Conversely, at the age of <20 years, a woman’s reproductive organs are not yet functioning properly, and at ≥35 years of age, there is a decrease in reproductive function.

This study showed the majority of mothers with stunted children had a low level of education. Mustamin et al. (2018) in South Sulawesi Province stated a relationship between the level of maternal education and the incidence of stunting in children under five. Rohmatun (2014) revealed a relationship between the level of mother’s education and the incidence of stunting in children under five (p= 0.007).

On the other hand, the study of Kusuma and Nuryanto (2013) stated that there was no relationship between maternal education and the incidence of stunting. It also stated that parental education was not a risk factor for stunting because there were many other risk factors for stunting, wherein in this study, not all factors were seen, such as parenting style and intake. Parental education has a direct influence on children’s food intake through parenting patterns.

This showed that the mother’s education level is one component that cannot be ignored. Mother’s knowledge of nutrition affects the mother’s behavior in providing food for her children. Mothers who have good nutrition knowledge are expected to provide the right type and quantity of food so that their children can grow and develop optimally (Astari, 2008). The study of Anisa (2012) stated that stunting in toddlers is more common in low maternal education. Mothers who have a higher education level tend to have good nutritional knowledge. They could make decisions to improve the nutrition and health of their children.

This study indicated that 85% of mothers who have stunted children under five were housewives. This study’s results are consistent with the research conducted by Neldawati (2006) that under-five children with stunting were mostly found in mothers who did not work. But there was no significant relationship between maternal occupation and the incidence of stunting. Mother’s job is related to child care and family economic status. Mothers who work outside the home can cause their children not to be properly cared for by their parents, because caring on the caregiver or other family members. On the other hand, working mothers can help with family income, supporting food quality and quantity (Diana, 2006).

Research conducted by Mentari and Hermansyah (2018) stated no relationship between maternal work and stunting incidence. Likewise, Lestari (2014) stated that there is no relationship between maternal work and stunting incidence. The research results by Mentari and Hermansyah (2018) stated that the status of stunting is more in children with mothers who do not work. Mothers who do not work outside the home have more time to care for their children, but if the parenting style is not good enough in their diet, there will be nutritional problems.

This study showed that the proportion of children under five with stunting was found that mothers who did not consume iron regularly during pregnancy were 21.7%. Adherence to taking iron tablets is associated
with the incidence of anemia during pregnancy. Research conducted by Widyaningrum and Romadhoni (2018) stated that pregnant women who suffer from anemia have 4 times the risk of their children being stunted than mothers who are not anemic.

Iron, folic acid, and iodine are important nutrients that pregnant women must meet to prevent stunting. Lack of iron and folic acid requirements can increase the risk of anemia in pregnant women. If the mother is anemic during pregnancy, the child born will be more at risk for stunting. The program of giving Fe tablets, which is at least 90 tablets during pregnancy, is an effort to prevent stunting by the health sector for pregnant women who routinely perform ANC.

This study showed 40% of stunted children were born to mothers who had chronic energy deficiency (CED) during pregnancy. The study by Miranty et al. (2019) showed a significant relationship between CED incidence during pregnancy and the incidence of stunting in children under five. Mothers who suffered from CED were 6.5 times the risk of having children under five with stunting compared to mothers who were not CED (OR= 6.46; 95% CI= 2.36 to 23.94; p= 0.001). Another suitable study conducted by Sartono (2013) showed a significant relationship between CED in pregnant women and the incidence of stunting in children aged 6-24 months (OR= 1.74; p= 0.042). Fajrina’s research (2016) also showed a significant relationship between nutritional status during pregnancy (CED) and stunting (OR= 4.15; 95% CI= 1.34 to 12.87; p= 0.010).

Nutritional deficiencies from the beginning of life in the womb can cause the fetus to have various fetus reactions, including slowed growth that can reduce the number and development of cell and organ function in the fetus. This can cause shortness when children enter adulthood (Bappenas, 2013).

Conflicting results were obtained in the research ofWarsini et al. (2016), who showed that history of CED during pregnancy was related to the incidence of stunting in children under five, but it was not statistically significant (OR= 0.61; 95% CI= 0.32 to 1.14; p= 0.134). The Supplementary Feeding Program for pregnant women with malnutrition (CED) is one of the efforts to prevent stunting by the health sector, especially from Posyandu and Puskesmas, by providing complementary foods in the form of pregnant mother's milk and biscuits for pregnant women. This is in line with the 4th pillar of handling stunting, encouraging the "Food Nutritional Security" policy (TNP2K, 2017).

This study results showed the proportion of children under five who are stunted, 38.3% of them do not receive breastfeeding exclusively in the first 6 months. Research conducted by Miranty et al. (2019) showed a significant relationship between exclusive breastfeeding and the incidence of stunting in children under five, where babies who were not exclusively breastfed had a 3.7 times risk of becoming stunted than those who were exclusively breastfed (OR= 3.70; 95% CI= 1.01 to 10.95; p= 0.018). The same results found in Arifin (2012) showed a relationship between exclusive breastfeeding and stunting incidence. The risk will increase 3 times in infants who are not exclusively breastfed. Angelina et al. (2018) also stated a significant relationship between exclusive breastfeeding and the stunting incidence in which children who were not exclusively breastfed had a 2.8 times chance of becoming stunted (OR= 2.81; 95% CI= 1.18 to 6.68; p= 0.028).
Exclusive breastfeeding is the provision of only breast milk for babies from birth to 6 months of age. However, there are exceptions, babies are allowed to consume drugs, vitamin, and mineral drops on a doctor’s advice (Permenkes, 2014). If a baby before 6 months of age has been given food other than breast milk, it will affect the baby’s intestines where the intestines cannot digest food. The nutrients cannot be adequately absorbed, and in the end, the baby will be prone to disease. Toddlers who often suffer from infectious diseases will cause their growth to be stunted and unable to achieve optimal growth (Angelina et al., 2018).

Babies who are exclusively breastfed tend to be taller and fit the growth curve compared to babies who are given formula milk. The calcium content in breast milk can be absorbed by the body to maximize growth, especially height, thereby minimizing the risk of stunting during toddlers and adulthood (Prasetyono, 2009).

This study showed that the proportion of children under five who were stunted was 65% due to improper feeding patterns where most mothers ignored their children to eat if they did not want to eat. This was in line with the study Gunawan et al. (2019). It showed a significant relationship between feeding patterns and the incidence of stunting.

One of the direct causes of stunting is the nutritional intake of the food provided and the mother’s feeding pattern. Mothers are required to provide good feeding patterns to their children, especially at the age of toddlers, who are very dependent on mothers in feeding to support the child’s growth process (Loya, 2017). The research results were in line with Yudianti (2016) research, which stated that there is a significant relationship between feeding practices and stunting incidence (p= 0.020).

Good parenting is paying attention to the frequency and type of food consumed by children to meet their nutritional needs. Giving good food is seen in terms of what the child eats and by paying attention to the attitudes that become a habit of mothers in providing nutrition for their children (Fauziah et al., 2017).

This study results showed that 6.7% of children under five who were stunted had experienced infectious diseases. The most common illnesses that occurred in the last 1 year were diarrhea and ARI. Infectious diseases are one of the direct factors causing children’s nutritional status under five and food consumption. Anshori (2013) stated that children who had a history of infectious diseases such as ARI had a 4 times chance of experiencing stunting (p= 0.023) than children who had no history of infectious diseases.

History of infectious disease has a back and forth interaction with nutritional status. Malnourished toddlers can increase the risk of developing infectious diseases, while infection itself can also cause malnutrition, leading to a vicious circle. Undernourished children have low immunity. So they will fall sick easily and cause less nutrition and create antibodies against disease (Anisa, 2012).

Based on the results of the study, it can be concluded that the factors causing stunting are the level of maternal education and work status, the maternal lack of iron consumption, a history of CED, not exclusive breastfeeding, improper feeding, and the presence of infectious diseases. With this result, it is hoped that various related parties can play an active role to jointly reduce and prevent the incidence of stunting in children under five.

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The 7th International Conference on Public Health
Solo, Indonesia, November 18-19, 2020 |124
https://doi.org/10.26911/the7thicph-FP.03.22