THE RELATIONSHIP BETWEEN DIVERSE FOOD CONSUMPTION AND STUNTING IN INFANTS AGED 6-24 MONTHS IN INDONESIA

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INTRODUCTION

Complementary feeding of breast milk in children under two years old or battuta (aged 6–24) months needs to be adapted to different types of food fusions. Inadequate feeding practices result in malnutrition and stunting problems resulting in delays in infant growth and development (Eshete et al., 2018). Globally, every year 3.1 million children under five die from improper nutrition practices (UNICEF, 2020). More than 55% of toddlers are stunted in Asia. Of the total 83.6 million stunted children in Asia, 33.3% are from South Asia, while the region with the lowest stunting rate is East Asia, which is 5.3% (UNICEF, 2020). Meanwhile, according to the Indonesian Ministry of Health, 2021 the 2021 Indonesian Nutrition Status Study (SSGI) in 34 provinces showed that the national stunting rate fell from 27.7% in 2019 to 24.4% in 2021. The prevalence has decreased, but based on WHO criteria, it is still classified as a high category (>20%) (SSGI, 2021).
From birth to 6 months of age, the baby's nutrition has been fulfilled by exclusive breastfeeding, while when the baby is more than six months old, his nutritional needs will increase so that there is a need for complementary foods (Gautam et al., 2016). It aims to meet the nutritional needs of babies by containing carbohydrates, proteins, fats, iron, vitamins, and other minerals needed by the baby's body (Eshete et al., 2018). The increasing prevalence of malnutrition in children aged 6–24 months is related to the practice of feeding complementary foods that are not in the right amount, type, or texture (Ahmad et al., 2018).

Food diversity is one of the indicators used to assess nutritional adequacy. In addition, it can also be used to see the group of food consumed by people in a particular area (Eshete et al., 2018). The practice of providing additional food diversity in developing countries is based on the geographical conditions of each region and is more likely to be adapted to the social conditions of the family. Families that are classified as underprivileged will mostly consume staple foods whose nutritional value is little to none (Mitchodigni et al., 2017).

This study used the free variables of children's age (6–11 months, 12–17 months, and 18–23 months), and children's gender (male and female). Maternal characteristics include maternal age (15–19 years, 20–24 years), 25–29 years, 30–34 years, 35–39 years, 40–44 years, and 45–49 years), maternal education (not going to school, elementary school, junior high school/high school, university), access to maternal information to mass media (internet use, reading newspapers or magazines, watching television, and listening to the radio). While family factors include the quintile of wealth and residence, of course, the poverty category, namely Q1-Q5 based on categories according to Bappenas. The wealth index is calculated based on selected assets at the household level such as bicycles, sanitation facilities, and others. Details of the wealth index construction can be found in the DHS program (DHS Program, 2020).

Based on previous research, various factors make nutrition to children in preventing stunting. These factors are education, access to information, maternal knowledge, and also place to live, whether in the City or the Village. The relationship between diverse food consumption is also an important factor in stunting prevention. Therefore, it is necessary to know how food consumption is related and the impact on Padua children (6-24 months). In general, references from research conducted in Indonesia with a literature approach. Article writing aims to link the consumption of diverse foods from complementary food to stunting in
baduta children. Another goal is to find out the application of complementary food in dealing with stunting in baduta children.

METHODS

The method used in writing this article is the literature review, which is a literature search both nationally and internationally carried out using a database. Article searches are conducted using four electronic databases, namely Google Scholar, Researchgate, PubMed Central, and ScienceDirect. The keywords used are "MPASI and Stunting". Researchers use scientific sources as sources of review literature in this study, here are some scientific articles as a reference: i) Articles from national and international journals from 2016 to 2022, (ii) full text and open access articles, (iii) research articles using English and Indonesian. The exclusion criteria are (i) thesis, thesis, or dissertation, and (ii) research published before 2016. After filtering articles according to the inclusion criteria in 3 databases, articles that meet and can be studied are found. Furthermore, as many as eight articles are considered to meet the inclusion criteria. The number of articles that the author gets is 11 international and national scientific papers/journals related to complementary food and stunting. The articles that can be analyzed are 11 articles because they are related to current research.

The search returned 11 articles after removing duplicate articles, 8 remaining. After screening the titles and abstracts which are not in accordance with the themes included, are letters/reports/brief communications/chapters. The final screening resulted in 8 articles that met the inclusive criteria.

RESULTS

Stunting

Stunting is a bad result of long-term malnutrition since the womb or the child is often sick which causes the child's height to be too short for his age. Stunted children cannot achieve optimal height and are not fully able to develop the cognitive potential of their brains. In another sense, stunting is a nutritional condition based on the index of body length according to age (PB / U) or height according to age (TB / U) is relatively short and very short. Children are classified as short (Stunted) and very short (Severely Stunted) if the Z-Score value of the body length index according to age (PB / U) or height according to age (TB / U) according to
less than -2SD / standard deviation (Stunted) and less than -3SD / standard deviation (Severely Stunted) (Kemenkes RI, 2020).

Malnutrition can occur when the child is in the womb or early after the child is born and stunting usually appears after the child is 2 years old. The age range for stunting is 24-59 months. This is because children's food intake that begins to be given at the age of 6 months is often inadequate in terms of quantity and quality which causes unstable child growth, therefore environmental exposure can increase the child's risk of developing infectious diseases. Growth disorders in children are caused by inadequate food intake and recurrent infectious diseases, causing children to lose their appetite and increasing the child's need to fight the disease (Rahayu, 2020). Based on research conducted by Juarni et al., (2022) the distribution of the age frequency of stunting occurs more often at the age of 12-23 months. This is because stunting occurs from the time the child is in the womb after the child is born (Juarni et al., 2022).

Stunting in baduta children is usually not realized because the difference between stunted and normal children at that age is not visible (Siringoringo et al., 2020). Baduta who is stunted will cause the child's muscle tissue to be underdeveloped so that it cannot reach a height that is appropriate for an age when it grows up. The results showed that the development of stunted children was lacking by 94.1% compared to children who were not stunted (62.2%). Statistical tests yielded a p-value = 0.021, showing a significant association between stunting and child development (Yadika et al., 2019).

Complementary Food

Complementary food is food and beverages given to meet the nutritional needs of children aged 6 to 24 months. WHO in collaboration with the Ministry of Health and the Indonesian Pediatric Association (IDAI) confirmed that only exclusive breastfeeding is given up to 6 months of age. Therefore, complementary foods can only be introduced to babies when they are 6 months old or older. Complementary food is an alternative food from breast milk to family food. Feeding takes place gradually, such as the type, number of meals, frequency of intake, and type of food, according to the age and digestive ability of the baby. Because babies are more active after 6 months of age, they need food that can complement breast milk to meet nutritional needs according to their development and growth. From the age of 6 months, babies experience very rapid growth that they need more intake (Lestiarini & Sulistyiorini, 2020).
Food consumption is a vital component that has an important role in determining the nutritional status of children. One of the indicators of the quality of children's consumption is determined based on food diversity (Utami & Mubasyiroh, 2020). A diverse diet can be defined as different types of food consumed varying well between food groups consisting of staple foods, side dishes, vegetables, and fruits. None of the types of food have all the nutrients needed by the body to support growth and efforts to maintain health (Kemenkes RI, 2018). Therefore, a diverse diet is very important to meet all the nutritional components that the body needs.

The Effect of Complementary Food in Stunting Events in Children Aged 6-23 Months

In previous studies, the process of stunting events can occur in various things and events. Researchers have conducted a literature review process. The following is a matrix of research review literature that has the theme of Stunting and complementary food in children aged 6-23 months as follows:

<table>
<thead>
<tr>
<th>No</th>
<th>Name</th>
<th>Research Title</th>
<th>Study Design</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(Ahmad et al., 2018)</td>
<td>Complementary feeding practices and nutritional status of children 6-23 months old: Formative study in Aceh</td>
<td>Literature Review</td>
<td>This research was conducted in an area in Aceh. Providing complementary food and other complements in fulfilling nutrition.</td>
</tr>
<tr>
<td>2</td>
<td>(Wanda et al., 2022)</td>
<td>El estilo de vida de la comunidad influye en las prácticas de alimentación de los bebés y niños pequeños de Indonesia Community lifestyle influences feeding practices among Indonesian infants and young children</td>
<td>Qualitative</td>
<td>This study explains that giving a regular complementary food pattern affects the development of children in Indonesia.</td>
</tr>
<tr>
<td>3</td>
<td>(Eshete et al., 2018)</td>
<td>Determinants of inadequate minimum dietary diversity among children aged 6-23 months in Ethiopia: Secondary data analysis from Ethiopian demographic and health survey 2016.</td>
<td>Quantitative</td>
<td>This study was conducted in the Ethiopian region during the process of children growing and developing at the age of 6-23 months to provide the impact of malnutrition and also stunting prevention and advancing health.</td>
</tr>
<tr>
<td>4</td>
<td>(Gautam et al., 2016)</td>
<td>Determinants of infant and young child Mix Method</td>
<td>In the process of this study, the provision of nutrition in early</td>
<td></td>
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feeding practices in Rupandehi, Nepal.

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<tr>
<th>5</th>
<th>Idikó Csölle, 2022,</th>
<th>Health Outcomes Associated with Micronutrient-Fortified Complementary Foods in Infants and Young Children Aged 6–23 Months</th>
<th>Quantitative</th>
<th>In the process of food availability and also providing good nutrition, children aged 6-23 months can be prevented from stunting</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>(Khaerunnisa et al., 2019)</td>
<td>Feeding Practices for Stunting Children Aged Bahwah Two Years in Cimahi Village</td>
<td>Qualitative</td>
<td>This study was conducted on children aged 2 years to improve nutrition and also prevent stunting.</td>
</tr>
<tr>
<td>7</td>
<td>(Paramashanti, 2019)</td>
<td>Individual dietary diversity is strongly associated with stunting in infants and young children.</td>
<td>Quantitative</td>
<td>This study has the result that stunting occurs because it is a rule in nutrition and food variety</td>
</tr>
<tr>
<td>8</td>
<td>(Lamid, 2015)</td>
<td>Stunting in Children Under Five: An Analysis of Prospects for Overcoming It in Indonesia.</td>
<td>Qualitative</td>
<td>This research looks at the perspective of countermeasures in dealing with stunting in Indonesia</td>
</tr>
</tbody>
</table>

Food diversity is a proxy indicator to determine the quality of consumption used in researching the adequacy of children's macronutrient and micronutrient intake. Fulfillment of balanced nutrition through the diversity of food types is an indicator of achieving optimal nutritional status and as an effort to prevent stunting in the future (Priawantiputri & Aminah, 2020). The staple food is a type of food that has carbohydrate content. The type of staple food is a food that is often consumed and is part of the eating culture in Indonesia. In addition, staple foods also contain several nutrients such as riboflavin and thiamine (Kemenkes RI, 2018).

The principles of good feeding practices include three aspects that include the provision of sustainable complementary foods: the introduction of complementary foods to breast milk, the diversity of foods, proper nutrition, and the frequency of feeding. The next aspect regarding the mother's attitude to feeding practices is the adjustment of feeding methods to the child's psychomotor abilities, responsive feeding, and the creation of a good feeding situation. The last aspect concerns the adaptation of children to family food (Khaerunnisa et al., 2019). Based on research conducted by Bela et al (2020) stated that mothers with poor feeding habits in their
toddlers have an 8.8 times a greater tendency to have stunted toddlers than mothers with good feeding habits in their toddlers (Bella et al., 2020).

After 6 months of age, complementary food is given to fill malnutrition because breast milk alone cannot meet the nutritional needs of children. If complementary foods are not given, then the nutritional needs of both macronutrients and micronutrients will not be met. It also affects the linear growth of the child (Mangkat et al., 2016). Children who are exclusively breastfed and given complementary foods as needed can reduce the risk of stunting. This is because children who are exclusively breastfed at the age of 0 to 6 months can develop immunity to avoid infectious diseases. Then, at the age of 6 months, complementary breast milk is given in appropriate amounts, frequencies, and textures to meet the nutritional needs of children and reduce the risk of stunting (Wangiyana et al., 2021).

Good and accurate complementary food administration practices, with minimal frequency and variation of complementary food administration. Without the frequency of eating and the variety of complementary foods, children can be at risk of malnutrition, which results in stunting, as well as increasing morbidity and mortality. Based on research conducted by Nurkomala, Nuryanto, and Panunggal (2018), there is a relationship between food variation and stunting in children (Nurkomala et al., 2018). This research is in line with the results of a study conducted by Prastia (2020) that 31.7% of stunted children do not have diverse food consumption patterns. Food diversity is related to stunting rates in children aged 6-23 months. The risk of children experiencing stunting is three times higher in children who have non-diverse food consumption patterns (Prastia, 2020).

Therefore, the United Nations International Children's Emergency Fund (UNICEF) advises children aged 6-23 months to consume at least four of the seven types of food to meet their nutritional needs and introduces them to a variety of flavors and textures. A diverse diet each day includes foods from different food groups: (1) seeds, roots, and tubers; (2) peas and beans; (3) dairy products (milk, yogurt, cheese); (4) meat (beef, fish, poultry, and liver or offal); (5) eggs; (6) fruits and vegetables rich in vitamin A (carrots, 24 mangoes, dark green leafy vegetables, pumpkins, yellow sweet potatoes); and (7) other fruits and vegetables (UNICEF, 2020).

The frequency of additional feeding depends on the development and growth of babies aged 6-23 months. Frequency of additional feeding should be carried out regularly and
regularly since the child must consume appropriate amounts of food to meet the needs of caloric intake and other nutrients. If the frequency of complementary food intake is sufficient, it can meet the food intake and nutritional intake of children based on their age. The texture of complementary food should develop gradually with age, according to the needs and abilities of the child. The texture of the child's food moves from eating pureed food to soft food to family food by the time it reaches its freshman year. Improper texture can interfere with nutritional intake, as children may only be able to consume small amounts (UNICEF, 2020).

In the first 2 years of life, babies and children need very high macronutrients and micronutrients to help achieve optimal growth and development. After the age of 6 months, breast milk is no longer enough to meet the needs for complete nutrients. The provision of complementary foods has the aim that babies older than 6 months get a complete nutritional intake and can achieve optimal catch-up (Lamid, 2015). Good food selection provides any kind of nutrients necessary to carry out the normal functioning of the body. If the selection of food is not good, it can lead to deficiencies in essential nutrients where the nutrients are only obtained through food. Malnutrition caused by poor food quality has an impact on energy production, impaired growth processes, the body's defense system, brain function and structure, and Almatsier behavior in (Prastia, 2020).

The results of the data analysis of Nai's research in Prastia (2020) show that most children consume a variety of foods in a day. As many as 31.7% of stunted children have diverse food consumption patterns. Food diversity has a relationship with the incidence of stunting in children aged 6-24 months. The risk of children experiencing stunting is 3 times greater in children who have non-diverse consumption patterns. Poor consumption of variegated foods is significantly associated with the incidence of stunting in children aged 6-24 months. Baduta with low food diversity is 16.67 times more likely to be stunted when compared to the consumption of food diversity with high nutritional value (Paramashanti, 2019). In line with other studies that have been carried out, the diversity of food consumption has been shown to have a relationship with stunting in toddlers aged 6-24 months (p-value = 0.005). The more diverse the consumption of food, the better the nutritional status.

At the age of 6-24 months, it is a period to continue breastfeeding so the type of food given is a form of complementary food for breastfeeding to help meet nutritional needs that cannot be met only by breastfeeding. The results of previous studies in children aged 6-23 months
illustrate a significant linear trend between the level of diversity scores of complementary food and the risk of stunting. Increasing the consumption of diverse food groups in a day can reduce the risk of children experiencing stunting Nai in (Prastia, 2020).

CONCLUSIONS

The conclusion of this study is how malnutrition can occur when the child is in the womb or early after the child is born, and Stunting usually appears after the child is 2 years old. The age range for stunting is 24-59 months. This is because children's food intake that begins to be given at the age of 6 months is often inadequate in terms of quantity and quality of diversity that causes unstable child growth, as well as environmental exposure that can increase the child's risk of developing infectious diseases. Growth disorders in children are caused by inadequate food intake and recurrent infectious diseases that cause children to lose their appetite with the insufficient frequency of complementary food intake. Therefore, children are required to be able to meet food intake and nutritional intake based on their age.

It is suggested to Cadres, health workers should play a more active role in providing information or counseling about stunting by providing counseling or group discussions about the importance of providing complementary food for breastfeeding to mothers who have toddlers, and are advised to carry out nutrition monitoring and assistance in providing nutrition training to mothers who have have toddlers.

REFERENCE


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