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# Exclusive Breast Milk and Additional Milk For The Nutritional Status of Children Aged 12-23 Months in Limo District, Depok City

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A B S T R A C T

Stunting is the result of chronic or recurrent malnutrition and often lasts a lifetime. Stunting can be caused by a lack of awareness of mothers in the practice of feeding children. The purpose of this study was to determine the relationship between exclusive breastfeeding and supplementary milk with the nutritional status of children. The research hypothesis is that there is a relationship between exclusive breastfeeding and supplementary milk with the nutritional status of children. The research took place in Limo District, Depok City. The research design was a case-control study. The subjects in this study were children aged 12-23 months. Cases are stunted children aged 12-23 months with a PB/U index with a z score of -3 SD to < -2 SD, while controls are children with normal nutritional status or who have a PB/U index with a z score of -2 SD to + 3 SD. Based on the sampling formula, a minimum sample of 50 was obtained. The final number of samples was 110 children. Data analysis was carried out univariate, bivariate and multivariate with multiple logistic regression. The results of the analysis showed that there was a relationship between supplementary milk feeding and the frequency of feeding with the nutritional status of the child, while exclusive breastfeeding was not associated with the child's nutritional status. Thus, supplemental feeding and frequency of feeding are related to the nutritional status of children. From these results, the researchers recommend that health workers need to strengthen their educational programs to the community, related to parenting, feeding and clean living patterns so that children's growth and development are optimal.



*Kata kunci:*

ASI Eksklusif
Susu Tambahan
Status Gizi

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A B S T R A K

Stunting merupakan hasil dari kekurangan gizi kronis atau berulang dan sering berlangsung seumur hidup. Stunting dapat disebabkan oleh kurangnya kesadaran ibu dalam praktik pemberian makanan pada anak. Tujuan dari penelitian ini adalah untuk mengetahui hubungan antara pemberian ASI Eksklusif dan susu tambahan dengan status gizi anak. Hipotesis penelitian adalah ada hubungan antara pemberian ASI Eksklusif dan susu tambahan dengan status gizi anak Penelitian berlangsung di Kecamatan Limo, Kota Depok. Desain penelitian adalah studi kasus kontrol. Subyek pada penelitian ini adalah anak usia 12-23 bulan. Kasus adalah anak stunting usia 12-23 bulan dengan indeks PB/U dengan z score -3 SD sd < -2 SD, sedangkan kontrol adalah anak dengan status gizi normal atau yang memiliki indeks PB/U dengan z score -2 SD sd + 3SD. Berdasarkan rumus pengambilan sampel diperoleh sampel minimal sebanyak 50. Jumlah akhir sampel adalah 110 anak. Analisis data dilakukan secara univariat, bivariat dan multivariat dengan regresi logistik berganda Hasil analisis menunjukkan bahwa ada hubungan antara pemberian susu tambahan dan frekuensi pemberian makan dengan status gizi anak, sedangkan pemberian ASI Eksklusif tidak berhubungan dengan status gizi anak. Dengan demikian Pemberian susu tambahan dan frekuensi pemberian makan berhubungan

dengan status gizi anak. Dari hasil tersebut maka peneliti merekomendasikan bahwa Tenaga kesehatan perlu menguatkan program edukasinya kepada masyarakat, terkait pola asuh, pemberian makan dan pola hidup bersih sehingga pertumbuhan dan perkembangan anak optimal.



## INTRODUCTION

The 6-24 month age period is one of the critical periods for growth and development (Shrimpton et al, 2001), because of the high need for nutrients coupled with limited quality and quantity of complementary foods. Babies who are not given adequate nutritional intake can become malnourished. Stunting is the result of chronic or recurrent malnutrition and often lasts a lifetime (UNICEF, WHO, World Bank Group, 2015). WHO reports that around 165 million children under the age of five are stunted and 90% more are in Africa and Asia. Indonesia ranks fifth highest in the world for the number of children with stunting (UNICEF, WHO, World Bank Group, 2015).

Stunting is a serious problem that must be addressed immediately. The results of the 2018 Basic Health Research (Riskesdas) show that the prevalence of stunting in Indonesia has decreased from 37.2% in 2013 to 30.8%. Although it has decreased, it is still above the maximum stunting limit set by WHO, which is 20%.

The results of the study show that the incidence of stunting is associated with poor educational achievement, decreased length of education and lower income as an adult. Stunting children face a greater chance of growing up to become adults who are less educated, poorer, less healthy and more vulnerable to non-communicable diseases. Therefore, stunting children are widely accepted predictors of poor quality of human resources, which further reduces the productive ability of a nation in the future (Heckman, 2006; Alderman, 2010; Pradhan et al, 2013).

Other factors that are also related to stunting are hormones, genetics and low parental knowledge in parenting, poverty, low environmental sanitation, low food accessibility at the family level, especially in poor families, low family access to basic health services (El Taguri et al, 2009) , and inappropriate breastfeeding practices. Inappropriate breastfeeding practices include delayed IMD, non-exclusive breastfeeding, and early cessation of breastfeeding (WHO, 2013).

Breastfeeding has a positive relationship with the health, growth and development of children. Infants who were exclusively breastfed from 0-3 months showed a higher average body weight compared to infants who were not exclusively breastfed (Kramer et al, 2003). Infants who are exclusively breastfed tend to be higher at the age of 6-12 months compared to children who are not exclusively breastfed (Spyrides et al, 2005; Zalla, 2015).

Although there have been many studies that prove the benefits and advantages of breastfeeding, some studies actually show the opposite results. There is no difference in weight and height of children aged three months to three years who are given breast milk and not breastfed (Nnyepi, 2000). Infants who were exclusively breastfed for four months (de Hoog et al, 2011; Rzehak et al, 2009) were slightly smaller and shorter than infants who were breastfed when the infant reached seven months of age. Infant growth will also continue to slow down until the child is 12 months old (Andres et al, 2013; Oddy et al, 2006). Several other studies have reported that the duration of breastfeeding is associated with a decrease in growth indicators for children aged 1-3 years (Buckley, 2001; Gubbels et al, 2011; Haider & Saha, 2016; Mihrshahi et al, 2011; Rogers & Blissett, 2017).

In addition to inappropriate breastfeeding practices, another factor that is also associated with stunting is the provision of complementary feeding (MPASI). There are several nutrients related to stunting such as carbohydrates as the main energy source, protein, iron, zinc, calcium, and vitamins D, A and C (Sedgh et al, 2000).

Milk is an animal source that contains energy, protein and micronutrients that function to support children's growth (Dron & Alen, 2011). Milk is part of the diversity of MP-ASI, which is needed to meet the nutritional needs of children. The restriction on breastfeeding until the age of three years is recommended by WHA, it is feared that it can increase the risk of stunting in children. This is reinforced by several studies showing that there is an effect of giving milk to increase in height.

Several studies have shown that exclusive breastfeeding is positively associated with an increase in infant weight and length, but this relationship has not been strongly confirmed because the age of the children observed was more than one year old. On the other hand, several studies have shown that the growth indicators of children who are breastfed until the age of two years or older are lower than those of infants who are given additional milk or mixed feeding (breast milk and supplementary milk).

## METHOD

### *Place and time*

This type of research is quantitative analytic. The quantitative design used is a case control study. The study was conducted to see the relationship between breastfeeding and supplementary milk with the nutritional status of children aged 12-23 months in Limo District, Depok City.

The subjects in this study were children aged 12-23 months who were still breastfed. Cases were stunted children aged 12-23 months with an index of TB/U with a z score of -3 SD to < -2 SD, while the controls were children with normal nutritional status or who had an index of TB/U with a z score of -2 SD to + 3 SD. . The comparison of the number of samples is one to one, which means that the number of cases is the same as the number of controls. Based on the sampling formula, a minimum sample of 50 was obtained. The final number of samples was 110 children.

The independent variables in this study were exclusive breastfeeding and supplementary milk. The covariate variables were child characteristics (age, birth weight, birth length, and gender), mother's education, maternal age, income, number of family members, history of illness in the last 1 month, complementary feeding, early initiation of breastfeeding (IMD), diversity of food, and frequency of feeding. Data collection was obtained through interviews,

observations of mothers and families. Anthropometric measurements of body weight using Dacin, while measuring height using a microtoise with a capacity of 200 cm and an accuracy of 0.1 cm, then calculating the z score for height according to age (TB/U) using the WHOAntro software. Food consumption was measured using a 24-hour food recall processed with a nutrisurvey program which was then converted into macronutrients and micronutrients. Data analysis was performed univariate, bivariate and multivariate with multiple logistic regression. The expected result in this study is that exclusive breastfeeding and supplementary milk can minimize or avoid the risk of stunting in children aged 12-23 months.

## RESULTS AND DISCUSSION

The results showed that the average age of the mother was 30.54 years with the average length of mother's education being eleven years and the average number of family members was 4 people. The mean age of the children was 17.52 months and the mean birth weight and birth length were normal.

**Table 1.**
**Characteristics of children and mothers in Limo District, Depok City**

| Variabel | Mean ± SD |
|---|---|
| Mother's education (years) | 11.34±3.075 |
| Mother's age (years) | 30.54±6.074 |
| Number of family members | 4.16±1.082 |
| Child's age (months) | 17.52±3.604 |
| Birth weight (grams) | 3023.77±385.577 |
| Birth length (cm) | 48.177±2.0783 |

### Bivariate Analysis

The results of the bivariate test between the independent variable and the dependent variable can be seen in the following table

**Table 2.**
**Results of Bivariate Analysis (N=110)**

| Variabel | Kasus | | Kontrol | | Total | | p-value* |
|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | |
| Exclusive Breastfeeding | | | | | | | |
| 1. No Exclusive Breastfeeding | 26 | 45.6 | 19 | 35.8 | 45 | 40.9 | 0.397 |
| 2. Exclusive Breastfeeding | 31 | 54.4 | 34 | 64.2 | 65 | 59.1 | |
| Supplementary Milk Pemberian | | | | | | | |
| 1. not given | 48 | 84.2 | 7 | 13.2 | 55 | 50 | < 0.001 |
| 2. given | 9 | 15.8 | 46 | 86.8 | 55 | 50 | |
| Child gender | | | | | | | |
| 1. Boys | 30 | 52.6 | 23 | 43.4 | 53 | 48.2 | 0.437 |
| 2. Girls | 27 | 47.4 | 30 | 56.6 | 57 | 51.8 | |
| Mother's work | | | | | | | |
| 1. Work | 8 | 14.0 | 9 | 17.0 | 17 | 15.5 | 0.646 |
| 2. Not working | 49 | 86.0 | 44 | 83.0 | 93 | 84.5 | |
| Family income | | | | | | | |
| 1. < UMK Depok | 25 | 43.9 | 20 | 37.7 | 45 | 40.9 | 0.646 |
| 2. Depok UMK | 32 | 56.1 | 33 | 62.3 | 65 | 59.1 | |
| History of illness in the last 1 month | | | | | | | |
| 1. Sick 1x | 20 | 35.1 | 0 | 0.0 | 20 | 18.2 | < 0.001 |
| 2. Not suffering from pain | 37 | 64.9 | 53 | 100 | 90 | 81.8 | |
| Complementary feeding | | | | | | | |
| 1. Before 6 months | 13 | 22.8 | 9 | 17.0 | 22 | 20.0 | 0.397 |
| 2. After 6 months | 44 | 77.2 | 44 | 83.0 | 88 | 80.0 | |
| IMD | | | | | | | |
| 1. No IMD | 15 | 26.3 | 13 | 24.5 | 28 | 25.5 | 1.000 |
| 2. IMD | 42 | 73.7 | 40 | 75.5 | 82 | 74.5 | |
| Food diversity | | | | | | | |
| 1. Less than 4 types of food groups | 30 | 52.6 | 7 | 13.2 | 37 | 33.6 | < 0.001 |
| 2. Consume 4 or more food groups | 27 | 47.4 | 46 | 86.8 | 73 | 66.4 | |
| Feeding frequency | | | | | | | |
| 1. < 3x per day | 28 | 49.1 | 8 | 15.1 | 36 | 32.7 | < 0.001 |
| 2. 3-4x per day | 29 | 50.9 | 45 | 84.9 | 74 | 67.3 | |
| Mother's education | | | | | | 0.318 | |
| Mother's age | | | | | | 0.672 | |
| Number of family members | | | | | | 0.246 | |
| Birth weight | | | | | | 0.931 | |
| Birth length | | | | | | 0.231 | |

* significance value using chi-square test (category data) and Pearson correlation test (numeric data)

The results of the analysis showed that more than 50% of mothers gave exclusive breastfeeding to their children, both in the case group and in the control group. More than 75% of mothers in the case group did not give additional milk, but on the contrary in the control group most of the mothers gave additional milk (86.8%).

The results of the analysis also showed that additional milk, history of illness in the last 1 month, variety of food, frequency

of feeding, number of family members, and birth length were related to the nutritional status of children. So that these variables can be included in the logistic regression analysis (p = 0.25).

**Multivariate Analysis**

The results of multivariate analysis using logistic regression showed that supplementary feeding and frequency of feeding were important factors in the growth of children's height. Giving additional milk 3,647 times can prevent stunting in children.

**Table 3.**
**Logistics Regression Test of Exclusive Breastfeeding and Supplementary Milk on Children's Nutritional Status**

| Sumber | B | df | *P-value* | Exp (B) | 95% C.I. for EXP (B) | |
|---|---|---|---|---|---|---|
| | | | | | Lower | Upper |
| Supplementary milk | -3.647 | 1 | <0.001 | 0.026 | 0.008 | 0.085 |
| Feeding frequency | -1.867 | 1 | 0.004 | 0.155 | 0.043 | 0.555 |
| Constant | 5.891 | 1 | 0.000 | 361.928 | | |

## DISCUSSION

The results showed that exclusive breastfeeding was not associated with the nutritional status of children aged 12-23 months. Factors related to the nutritional status of children aged 12-23 months are additional milk and feeding frequency.

Mother's Milk (ASI) is the best food that is recommended to be given to babies because it has various benefits for the baby's health. The advantages and benefits of breastfeeding can be seen from several aspects, namely: nutritional aspects, immunological aspects, psychological aspects, practical, ecological, economic and immunological aspects (Allen, 2012; Bravi et al, 2016; Erik, 2018). However, after the baby is 6 months old, he needs additional food known as MP-ASI to support normal growth and optimal health. The role of MP-ASI is not at all to replace breast milk, but only to complement breast milk. Complementary feeding to infants is given after the baby is 6 months old until the baby is 24 months old. Around 6% or 600 thousand deaths of children under five years old can be prevented by ensuring that these children are given optimal complementary foods (WHO, 2016).

The results of the study are also supported by the results of previous studies. There is a difference in weight and height of children who are exclusively breastfed and those who are given formula milk (Stettler et al, 2002). Infants who are given formula milk gain more weight faster than babies who are breastfed from 4 to 12 months of age. However, there was no difference in body length between formula-fed babies and breastfed babies.

Shinn (2017) concluded that children who were given formula milk and children who were given mixed feeding (breast milk and formula) had a higher weight percentile value for body length compared to children who were given breast milk and children who were given additional food. According to the results of an intervention study in India, supplemental feeding can increase the length of the child's body (Bhandari et al, 2004).

Infants who are given formula milk have a higher energy intake than babies who are exclusively breastfed. The energy intake of formula-fed infants is higher than the estimated average recommended energy (Kavanagh-Prochaska, 2006). Infants who are given formula milk with a higher fat content have a higher body length compared to infants given formula milk that contains lower fat (Fleddermann et al, 2013).

Babies need adequate nutrients to be able to optimize the entire process of growth and development. Although breast milk is the main food choice for infants, milk is the best alternative if the mother cannot provide breast milk or breast milk is insufficient (Alles et al, 2004). This encourages mothers to give milk as an addition or substitute for breast milk because the nutrient content in breast milk is no longer sufficient to meet the nutritional needs of babies. Other factors that also influence mothers not to breastfeed are husband and family support and mother's employment status (Ong et al, 2005; Ryan et al, 2006; Wiegand, 2008).

Another factor that must also be considered is giving the right food to babies at a certain age. The food given to infants must be of the right type, amount, and nutritional content (More et al, 2010). Babies who are not given adequate nutritional intake can experience malnutrition, diarrhea, and other infectious diseases. Children's disease history and food intake are factors that interact and influence the nutritional status of children.

The reality is that there are still mothers who give complementary foods to breast milk too soon or too early, so that their babies often get sick, such as fever and cold coughs because there are few protective factors for breastfeeding. So that in some children it can cause allergic reactions and can lead to obesity and obesity. On the other hand, there are still mothers who are late (babies more than six months old) in giving complementary foods to breast milk. This causes the baby's growth to be slow, tend to be thin and weigh less or not as normal and even malnourished. If the complementary feeding is not optimal and not in accordance with age, it is possible that the baby's development is not optimal.

## CONCLUSIONS AND SUGGESTIONS

Exclusive breastfeeding is not related to the nutritional status of children aged 12-23 months. Factors related to the nutritional status of children aged 12-23 months are additional milk and frequency of feeding to children.

The results showed that supplementary feeding and frequency of feeding were related to the nutritional status of children aged 12-23 months. Therefore, health workers, especially in Puskesmas, need to strengthen their education programs for the community, related to parenting, feeding and clean living patterns so that children's growth and development are optimal.

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