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Factors That Contribute To The Incident of Stunting Toddler In Working Area of Puskesmas Pupuan II

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ABSTRACT

Background: Stunting has negative impact to the quality of human resources in the future. The purpose of this study was to determine factors that can contribute to the incidence of stunting toddlers in the working area of the Puskesmas Pupuan II (Public Health Center). **Method:** This descriptive study used cross-sectional approach. The sampling technique was non probability sampling and the population was mothers with stunting toddlers in the working area of the Puskesmas Pupuan II with total 43 samples. The data used are primary data that obtained through interviews with respondents and the secondary data collected from the toddler cohort and the Maternal Child Health handbook. Data analysis used descriptive univariate. **Result:** The result of this study showed that the proportion of stunting incidents based on direct causal factors was found as many as (69,8%) of stunting toddlers did not get exclusive breasfeeding, (86%) stunting toddlers had a history of normal birth weight, (60,5%) of stunting toddlers were male, (90,7%) mothers of the sunting toddlers had a normal nutritional status during pregnancy, (88,3%) mothers were not anemic during pregnancy, while the proportion of stunting incident based on indirect causal factors showed (60,5%) mothers were not at-risk age during pregnancy, (95,3%) mothers had normal weight, (65,1%) mothers had low education, (60,5%) mothers are unemploye, and (55,8%) the family income is low or below the minimum wage. **Conclusions:** Researchers' suggestions are Public Health Center heve to be more active in socializing the effects of stunting and its prevention and as well as mobilizing community leaders in sensitive nutrition interventions.

Keywords: Direct Causal Factors, Indirect Causal Factors, Stunting, Toddler

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INTRODUCTION

The life cycle of toddler is the golden period of the child's growth and development process which will provide provisions for the next phase of life. A child's growth during toddler years can be measured through height and weight adjusted for age. It is important for children to have sufficient height and weight, because this will affect their development, including the development of gross motor skills, motoric skills and cognitive development of the children. However, one condition that can highly affect a child's development is stunting.

Stunting is not only a problem of impaired physical growth, but also causes children to become sick easily, can experience impaired brain development and affects the productivity of children's performance in the future so that, stunting can become a major threat to the quality of human resources in Indonesia in the future. The regulation of Minister of Health of the Republic of Indonesia Number 2 of 2020 concerning Anthropometric Standards for assessing children's nutritional status states that stunting or short stature is a nutritional status based on the height index for age (TB/U) with a z score of less than -2 SD (standard deviation) (Ministry of Health of the Republic of Indonesia, 2020). Furthermore, stunting is caused by direct factors, namely family and household factors such as poor nutrition during preconception, pregnancy and lactation, inadequate complementary feeding, several problems in providing breast milk, infections, and endocrine disorders. Meanwhille the indirect causes of stunting are maternal characteristics consisting of maternal age, maternal education, maternal occupation, family income, and maternal knowledge about nutrition (Rahayu, et al., 2018).

Malnutrition during pregnancy to the first 1000 days of birth also influences the incidence of stunting. One of the effective concepts for treating stunting is prevention in the first 1000 days of life. Pregnancy preparation, health services for breastfeeding mothers, babies and toddlers are specific forms of intervention for handling stunting (Ministry of Health of the Republic of Indonesia, 2019). Midwife as a profession in carrying out midwifery practice have duties and authorities including maternal health services and child health services, as stated in Undang-Undang No. 4 of 2019 concerning Midwifery (article 46). In the Republic of Indonesia Minister of Health Regulation no. 28 of 2017 concerning Licensing and Implementation of Midwife Practice (Chapter II article 17), midwife have the authority to provide maternal and child health services. Article 24 paragraph (1) in the Regulation also outlines the authority of midwives based on government programs according to needs as intended in article 22 paragraph (1) where midwife carry out community participation in the field of maternal and child health as well as school-age children. The scope of midwifery services in providing maternal and child health services in carrying out their roles as implementers, service managers, as educators and as researchers in the success of government programs, especially reducing stunting through prevention in the first 1000 days of life.

In correlation with National Medium Term Development Plan (RPJMN) 2020-2024 regulated in Presidential Regulation Number 18 of 2020, the Indonesian government targets the stunting rate is decrease by 14% in 2024. However, the prevalence of stunting toddlers from the results of the 2021 Indonesian

Nutrition Status Survey (SSGI) in Indonesia is still 24.4%. Bali Province has stunting incidence rate of 10.9%, which is the province with the lowest national stunting rate. The incidence of stunting in Tabanan Regency in 2022 is 8.2% of the total height of children under five whose height is measured. Data from the Tabanan District Health Service for 2021 shows that the top three sub-districts with high stunting incidence rates in Tabanan district include Marga, Pupuan and West Selemadeg sub-districts (Tabanan District Health Service, 2021). Thus, authors are interest to determine the cross-program and cross-sector participation efforts which has been done to reduce stunting rates in Tabanan District of Bali Province, especially in Pupuan.

Registered data from cohorts of infants and toddlers at the Puskesmas Pupuan II (Community Health Center) in 2022, whose working area consists of seven villages, namely Kebon Padangan, Belimbing, Jelijih Punggang, Karya Sari, Sanda, Batungsel, and Padangan, there are 43 toddlers, 5.6% of the total 765 toddlers measured based on PB/U experienced stunting in the category of 38 toddlers being short and as many as 5 toddlers being very short. Based on previous reports on the determinants of stunting, it was found that most stunting toddlers did not receive exclusive breast milk, came from mothers with CED and anemia during pregnancy, were at risk, had a family income below the minimum wage, and toddlers had a history of low birth weight. Efforts to overcome the direct causes of stunting have been carried out by the Puskesmas Pupuan II namely screening for risk factors for stunting starting from pregnancy, counseling on stunting prevention in pregnant women's classes, monitoring the growth of toddlers through weighing and measuring height, counseling regarding the importance of exclusive breastfeeding, as well as providing additional food (PMT) in Integrated Healthcare Center.

Given this background, the present study was performed to conducting research related to the factors that contribute to the incidence of stunting in toddlers in the working area of Puskesmas Pupuan II. By assessing these factors, the data obtained can be used as a basis for further research and contribute in policy making in the context of maximizing intervention efforts to overcome stunting in Indonesia.

METHOD

This research was using descriptive with crossectional approach to determine the characteristic attributes of respondents which carried out at a time without any follow-up. This research was conducted to determine the factors that contribute to the incidence of stunting in toddlers in the work area of the Puskesmas Pupuan II. There were four main steps of the study, first we conduct preliminary study including journals review and observe research location. Second, we determine the problem, including research design, population, and sample. Third, we look after the ethical clearance and research permit. After obtaining legality, we carried out the research starting from collecting data, data analysis, and presenting the data.

The location of this research was carried out from March to April 2023 in the work area of Pupuan II Publich Health Center which covers 7 villages including Kebon Padangan Village, Belimbing Village, Jelijih Punggang Village, Karya Sari Village, Sanda Village, Batungsel Village, and Padangan Village. The population was all mothers with stunting toddler, totaling 43 people. The research sample was

respondents who were in accordance with inclusion and exclusion criteria, the number of samples in this study was 43.The sample was given prior explanation regarding the aims of this research and asked for their consent and willingness to be involved in this research. If they agree, then it continued with explanation regarding the interview procedure and data collection through asking a list of questions according to the interview guidelines.

RESULTS

Incidence of Stunting Toddlers Based on Direct Causation Factors

Research data of stunting incidence in toddlers based on direct causation factors can be seen in Table 1 as follows.

Table 1. Incidence of Stunting Toddlers Based on Direct Causation Factors

Characteristic	Frequency	Percentage (%)
History of exclusive breasfeeding		
Yes	13	30,2
No	30	69,8
Total	43	100
History of low birth weight (LBW)		
Normal	6	14
LBW	37	86
Total	43	100
Gender		
Male	26	60,5
Female	17	39,5
Total	43	100
Mother's nutritional status during pregnancy		
Chronic energy deficiency	4	9,3
No chronic energy deficiency	39	90,7
Total	43	100
Mother's hemoglobin (Hb) during pregnancy		
Anemia	5	11,7
Normal	38	88,3
Total	43	100

Based on data in Table 1 above, it can be seen that of the 43 respondents in terms of direct causal factors, the incidence of stunting is based on a history of exclusive breastfeeding, the majority of toddlers (69.8%) did not received exclusive breastfeeding. Based on the history of low birth weight (LBW), it was found that the majority (86%) of stunting toddlers had normal birth weight. Based on the gender characteristics of toddlers, it was found that the majority (60.5%) were male and nutritional status of mothers during pregnancy majority (90.7%) did not have chronic energy deficiency during pregnancy. Based on maternal hemoglobin

levels during pregnancy, it was found that the majority (88.3%) of respondents were not anemia during pregnancy.

Incidence of Stunting Toddlers Based on Indirect Causation Factors

Research data of stunting incidence in toddlers based on indirect causation factors can be seen in Table 2 as follows.

Table 2. Incidence of Stunting Toddlers Based on Indirect Causation Factors

Characteristic	Frequency	Percentage (%)
Age		
At-risk	17	39,5
Not at-risk	26	60,5
Total	43	100
Body Height		
Normal	41	95,3
Short	2	4,7
Total	43	100
Mother's Education		
Low	28	65,1
Height	15	34,9
Total	43	100
Mother's Occupation		
Working	17	39,5
Unemployed	26	60,5
Total	43	100
Family Income		
<Minimum wage	24	55,8
≥Minimum wage	19	44,2
Total	43	100

Based on Table 2 above, of the 43 respondents in terms of indirect causal factors, the incidence of stunting based on maternal age was mostly found in mothers who were not at risk (60.5%). Based on the mother's height, it was found that most of mothers had normal height (95.3%). Based on the mother's education level, it was found that the majority (65.1%) of them had low education and majority (60.5%) were unemployed. Based on family income, it was found that the majority (55.8%) had a family income in the low category or below the minimum wage.

DISCUSSION

Description of stunting incindence in toddlers based on the direct causation of stunting in the working area of Puskesmas Pupuan II

a. History of Exclusive Breastfeeding

Exclusive breastfeeding means that babies are only given breast milk for the first 6 months of life without any additional drinks or food (except medicine and vitamins). Breast milk is a liquid that contains antibodies and also lots of protein, carbohydrates, fat which easily digested and absorbed that cannot be found in other types of milk, so breast milk is very important in supporting the growth, development and nutritional status of children (Fitriahadi dan Enny, 2018). After exclusive breastfeeding for 6 months, it can be continued to provide breast milk until the child is 2 years old along by providing complementary foods for breast milk. Children who are exclusively breastfed will have naturally formed immunity obtained from breast milk to prevent children from getting sick easily. Therefore parents, especially mothers are encourage to give exclusive breastfeeding to their toddlers (Septikasari, 2018).

However, this research data showed that the stunting toddlers did not receive exclusive breast milk, namely 30.2% (13 respondents) and those who received exclusive breast milk were 69.8% (30 respondents). This results is in line with the results of research conducted by Nurjanah (2018) in the work area of the Klecorejo Health Center, Madiun Regency, which based on chisquare test analysis show that the p value is 0.001 with a CI of 95%, meaning that there is a relationship between the history of exclusive breastfeeding and the incidence of stunting in toddlers.

Interviews conducted with respondents related to exclusive breastfeeding showed that the average respondent did not breastfeed exclusively because the mother's breast milk did not come out immediately when the baby was born, there were those whose breast milk came out after 3 days or more. Since the parents worried about the baby in hunger, then decided to give the baby formula milk. There are even mothers who admit that breast milk has not come out since birth at all. Mothers decide to give formula milk sometimes also because they don't know the importance of breast milk and the benefits of breast milk for their baby's health and growth.

b. History of low birth weight (LBW)

Low birth weight (LBW) is caused by the mother's poor nutritional status during pregnancy, causing intrauterine growth retardation and when the baby is born, they have low birth weight. The long-term problem caused by LBW is hampered growth and development. Low birth weight is believed to be one of the factors causing malnutrition in the

form of stunting in children (Fitriahadi dan Enny, 2018).

The results of this study showed that the majority of respondents did not have low birth weight (stunting in toddlers with a birth weight <2,500 grams was 14% (6 respondents)) and stunting in toddlers with a normal birth weight/≥2,500 grams was 86% (37 respondents). This result is in line with the results of research conducted by Pardede (2017) in Muara District which showed that 1 toddler (100%) was LBW did not experience stunting, while there were 28 toddlers who had a normal birth weight, so that statistical tests showed that birth weight had no influence on the incidence of stunting with a p value of 1,000.

The size of the baby at birth is related to the size of the child's growth because the baby's body size is related to the child's linear growth. However, as long as the child gets adequate nutrition and is maintained in good health, body length or physical condition can be followed by growth as the child gets older, but cognitive development cannot be pursued or repaired because it is permanent (Fitriahadi dan Enny, 2018).

There are other factors that contribute beyond the child's birth weight which increase the child's chances of experiencing stunting, in this case parenting patterns, especially suboptimal eating patterns and a history of infectious diseases that the child has experienced. If these factors are lasts for a long time during the child's growth period, the child can lose nutrients in the body, resulting in a decrease in nutritional status.

c. Gender of the child

The research results show that the majority of toddlers who experience stunting were 60.5% male, while 39.5% of stunted toddlers were female. This is in accordance with Taguri (2008) research in two studies conducted in three different countries (Libya, Bangladesh and Indonesia), showing that the prevalence of stunting is greater in male compared to female. The results of Sema's research (2008) also show that the child's gender is a strong predictor of stunting and severe stunting in children under five, which female toddler have a lower risk than male. During infancy and childhood, female tend to be less likely to become stunting and severely stunting.

In contrast to the results of research conducted by Pardede (2017) using a cross-sectional research design, there was no relationship between gender and the incidence of stunting in toddlers aged 24-59 months in Muara District with a p value = 0.426.

Researchers believe that this can happen because male's nutritional needs are greater than female. Male toddlers tend to be more active in activities which expend more energy, especially if this condition is along with child who has difficulty eating. If there is a lack of fulfilling the required nutritional intake, it will increase the risk of nutritional problems.

d. Mother's nutritional status during pregnancy

Chronic energy deficiency causes inadequate reserves of nutrients needed by the fetus in the womb, while in the womb, the fetus will grow and develop. The fetus has high plasticity, meaning that the fetus will easily adapt to changes in its environment, both beneficial and detrimental. Malnutrition that occurs in the womb and early in life causes the fetus to undergo an adjustment reaction. In parallel, these adjustments include slowing growth with a reduction in the number and development of body cells. The results of adaptive reactions due to malnutrition are expressed in adulthood commonly as a short body shape.

The results of this study show that the nutritional status of the majority of respondents during pregnancy did not experience chronic energy deficiency (KEK), namely 90.7% and there were 9.3% who experienced chronic energy deficiency. This is not aligned with research conducted at the Tawiri Community Health Center, Ambon City, where pregnant women with KEK during pregnancy were 4.85 times more likely to have stunting children compared to mothers who did not have KEK (Ruaida and Soumokil, 2018). Likewise, research conducted by Alfarisi, et al (2019) in Lampung Tenga Regency in Lampung Province with the results of the analysis obtained an OR value is 2.228, means that the nutritional status of mothers during pregnancy who experienced KEK had 2.228 times greater risk of stunting in toddlers compared to mothers who did not have KEK.

Researchers believe that this may be due to the high level of achievement in handling KEK cases in Puskesmas Pupuan II made pregnant women who potentially experience chronic energy deficiency can be immediately treated by health workers, so that intervention can be carried out as early as possible. Interventions given to pregnant women can improve their nutritional status, including increasing the baby's weight and baby body length. The existence of a supplementary feeding program (PMT) for pregnant women who suffer from KEK is one form of intervention provided so that the baby in the womb can continue to grow and develop well.

e. Mother's hemoglobin during pregnancy

Iron is one of the substances that plays role in bone formation. Iron plays a role as a distributor of oxygen to all body tissues and if oxygenation to the bones is decrease, then the bones cannot grow optimally. Iron deficiency can give serious impact on the bones, affecting bone mineral density, mineral content in the bones and the strength of the femur. A study conducted by Angeles in 1993 in Indonesia regarding iron supplementation in children aged 2-5 years showed that there were significant changes in height and height-forage z-score after iron supplementation.

The results of this study showed that the mother's hemoglobin (Hb) level during pregnancy was mostly normal, namely 88.3 (38 respondents) and 11.7% (5 people) had anemic during pregnancy. This is not in line with research which states Hb level of pregnant women is related to the length of the baby that will be born. The higher the Hb level, the longer the size of the baby that will be born (Ruchcayati, 2012). This research is in line with the results of research by Ruaida (2018) at the Tawiri Health Center, Ambon City, which stated that anemia in pregnant women was not related to the incidence of stunting (p value>0.05).

However, this study did not look at the incidence of anemia in all trimesters but only looked at the first trimester in the MCH book data, so progress in treating anemia in the final trimester was not visible. Reseacrher believed that optimal treatment of anemia cases accompanied by early intervention in cases of anemia, pregnant women who were known to have anemia from the start in the first trimester will no longer be anemic in the third trimester. Interventions given to pregnant women through administering iron medication and its monitoring can increase the Hb levels of pregnant women in Puskesmas Pupuan II.

2. Description of stunting incidence in toddlers based on indirect causation of stunting in the work area of Puskesmas Pupuan II.

a. Mother's Age

The results of this study showed that 60.5% (26 people) of respondents had a non-risk age when pregnant and 39.5% (17 respondents) of respondents had a non-risk age when pregnant. The results of this research are in line with research conducted by Agustiningrum (2016) which stated that there was no relationship between maternal age and the incidence of stunting in children under five and maternal age was not a risk factor for stunting.This can happen because the mother's nutritional status is good, so she requires small amounts of calories because natural

adjustments will occur such as increasing the efficiency of the body's metabolism and reducing physical activity during pregnancy. Young mothers do not necessarily have poor parenting patterns because information and experience today are easy to obtain from various sources and does not look at age.

The results of this study are not in line with the results of research conducted by Wemakor et al (2018) in Ghana which stated that maternal age had a significant relationship with the incidence of stunting in toddlers. Toddlers whose mothers are teenagers have eight times the risk of experiencing stunting compared to mothers old enough to conceive and give birth. The results of this study are also in line with research conducted by Menggala, et al (2018) which states that maternal age that is too young (<20 years) and too old (>35 years) has a significant relationship with the incidence of stunting and is four times higher risk. have stunted offspring compared to mothers with the ideal age (20-35 years).

c. Mother's height

The results of this study showed that 4.7% of respondents had short bodies and the majority, namely 95.3%, had normal height. This is not in line with the results of Safinatunnaja (2019) research conducted in the Terara Health Center and Rensing Health Center Working Areas, the number of mothers whose height was below standard (≤145 cm) had children with normal growth and development as high as 1 person (2.6%), while mothers who had normal height (≥146 cm) had 64 children with normal growth and development (84.2%).

Mothers and fathers who are classified as short tend to have children who have the potential to have a short body due to genetic factors in the chromosomes that carry the trait of stunting. Apart from this, an individual's height is also influenced by other factors such as nutritional intake and history of illness. For children who experience stunting due to lack of nutritional intake from an early age, stunting in their offspring can be intervened (Larasati et al, 2018).

The results of this research show that the majority of respondents' education level during pregnancy, 65.1%, had a low level of education, while 34.9% of respondents had a high level of education. This shows that most cases of stunted toddlers in the Puskesmas Pupuan II work area have mothers with low levels of education (junior high school level and below). Toddlers born to educated parents have a lower risk of stunting than toddlers whose parents are uneducated. This is because parents who have higher education have access and find it easier to

receive health education during pregnancy, for example in understanding the importance of meeting nutritional needs during pregnancy and providing exclusive breastfeeding for 6 months.

e. Mother's employment status

The research results showed that most mothers of stunted toddlers did not work, 60.5% (26 respondents) and 39.5% (17 respondents) of stunted toddlers whose mothers worked. The majority of respondents who work have non-formal jobs whose income is not fixed, such as farmers, traders, planters, namely 70.5% (12 respondents), while respondents who have jobs with a fixed income are 29.4% (5 respondents).

The results of this study are not in line with research conducted by Adyas (2019) in Lampung Province showing that working mothers have a risk of having children with stunted nutritional status of 4,808 times compared to mothers in the non-working category. The results of this research are in line with research conducted by Pardede (2017) in Muara District, North Tapanuli Regency, North Sumatra Province on 87 mothers of toddlers, of which 76 mothers did not work/did not have a fixed income, 25 people (32.9%) of toddlers experienced stunting and 51 (67.1%) toddlers who were not stunted, while of the 12 mothers who worked/had a fixed income there were 3 (25.0%) toddlers who experienced stunting and 9 people (75.%) toddlers who did not stunting, so the results of the research show that there is no influence of maternal employment on the incidence of stunting in toddlers aged 24-59 months (p = 0.823). Researchers' point of view, work is an important factor in determining income which ultimately determines the quality and quantity of adequate family nutrition.

f. Family income

Family income plays a very important role in fulfilling family nutrition. The level of income will affect the purchasing power of the family including fulfilling food consumption. The higher the income level of a family, the more budget allocation it will have to purchase food needs such as side dishes, vegetables, fruit and others to meet the family's nutritional needs (Fikawati and Syafiq, 2014).

The results of this research show that the majority of respondents' family incomes are in the low category (< Rp. 2,625,216) namely 55.8% and respondents with high family incomes (≥Rp. 2,625,216)) are 44.2%. This is in accordance with research conducted by Nurmalasari, et al (2020) where it was found that there was a relationship between family income and the incidence of stunting in toddlers in Mataram Ilir Village, Seputih District, Surabaya, where families with

middle income had a 2.2 higher risk of having children. with stunting compared to children with high income respondents. Some factors that cause nutritional problems are poverty. Poverty is considered to have an important reciprocal role as a source of nutritional problems, namely poverty causes malnutrition, whereas malnourished individuals will slow down economic growth and increase a country's poverty rate.

CONCLUSION

Based on the results of the research that has been carried out, it can be concluded that: 1) the proportion of stunting toddlers based on the direct causes of stunting in Puskesmas Pupuan II, the majority of stunting toddlers (69.8%) did not receive exclusive breastfeeding, had a history of normal birth weight (86%), most of toddlers with stunting (60.5%) were male, (90.7%) had normal nutritional status or had no history of KEK during pregnancy, and (95.3%) mothers had normal Hb levels during pregnancy ; 2) the proportion of stunting toddlers based on the indirect causes of stunting, based on the age of the mother shows that 60.5% of mothers of toddlers are of age who are not at risk when pregnant, 95.3% had normal height, 65.1% had low level of education, 60.5% mothers were unemployed, and 55.8% were in the low income category.

Conflict of Interest

The authors declare that they have no conflict of interest.

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