

Historical Relationship of Premature Labor and Low Born Weight with Nutrition Status of Children Under Three Years Old

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Abstract

Purpose: Determine the relationship between low birth weight (LBW) history and prematurity history with the nutritional status of three-year-old babies in Ngumbul Tulakan Village, Pacitan.

Methodology: This research is a descriptive analytic using a cross sectional approach. Population in this study were 123 babies three years old in Ngumbul Tulakan Pacitan Village. The sampling technique used was simple random sampling, with a sample size of 94 three-year-old baby. Data collection using the observation sheet. Data analysis used Chi square test with $\alpha = 0.05$.

Results: The results of this study were a small proportion of three-year-old babies with a history of low birth weight (LBW) in the village of Ngumbul Tulakan, Pacitan, there were 24 children (25.5%). Three year old babies with history of premature were 20.2% (as many as 19 three-year-old baby) in Ngumbul Tulakan Pacitan village. The nutritional status of three-year-old babies in the village of Gumbul Tulakan, Pacitan, is mostly normal (76.6%). The results of statistical tests showed that there was a relationship between LBW history with the nutritional status of three-year-old infants in Ngumbul Tulakan Village, Pacitan with a value of p value of 0.00. There is a relationship between a history of prematurity and the nutritional status of three-year-old baby in Ngumbul Tulakan Village, Pacitan with a value of p value of 0.00

Conclusion: It is recommended that mothers take their three-year-old babies to the posyandu regularly to monitor their growth and development and provide a balanced nutritional intake according to the needs of a three-year-old baby.

Keyword : low birth weight, prematurity, nutrition status

Introduction Section

The problem that can be caused by malnutrition is the high birth rate of babies with Low Birth Weight (LBW). Infants with poor nutrition are prone to disease due to decreased endurance. Other problems that can occur if there is an obstacle to growth will have an impact on their future, for example in children with less than normal body weight (BW) it can result in developmental delays, especially children under the age of 3 which at that age brain development very fast. The brain needs nutrients to develop. Underweight three-year-old baby can lose important nutrients due to malnutrition and malabsorption, which affects brain development and can cause delays in the developmental phase (Abubakar, 2010).

Based on data from UNICEF (2017), 37% of toddlers experience growth retardation. Meanwhile, the results of Riskesdas in Indonesia in 2018, the prevalence of three-year-old baby with less than normal body weight (BW) reached 17.7%. In East Java Province, the prevalence of three-year-old baby with body weight (BW) less than normal reaches 16.8%.

Based on the annual report of the Pacitan District Health Office in 2016 there were 27,507 three-year-old baby weighed, of these there were 1,358 three-year-old baby with overweight, 1,335 three-year-old baby with underweight, 290 with very thin three-year-old baby (Pacitan District Health Office, 2016).

The factors that can affect children's growth, especially physical growth including body weight (BW) are: genetics, nutritional intake (nutrition), LBW, comorbidities during infancy, family factors, socio-economic factors (types of economic activity, income, education level, type of residence, and position in the organization) and environmental factors (Yuniarti, 2015).

In the case of malnutrition, special attention is needed because it can hinder the physical and mental development of children. In addition, cases of malnutrition are also associated with an increased risk of illness and death as well as stunted growth and motor and mental development. Three-year-old baby with malnutrition

are at risk of decreased intellectual ability, productivity and increased risk of degenerative diseases in the future. Because children under five with malnutrition also tend to be more susceptible to infectious diseases, so children who experience infections are prone to malnutrition status (Indonesian Ministry of Health Research and Development Agency, 2010).

Providing nutrition to children with a history of low birth weight (LBW) is an important solution in achieving optimal growth by comparing fetal growth according to gestational period. Babies born prematurely weighing 2000 grams or more usually thrive on breast milk (ASI). However, babies with birth weight less than 2000 grams, can have a growth rate so fast that breast milk alone cannot supply enough essential nutrients for normal growth. Therefore, additional nutrition is needed in the form of LBW formula milk with more calorie content and smaller volume (Barness & Curran, 1999).

According to WHO, premature babies are babies born alive before the 37th week of gestation (counting from the first day of the last menstruation). The American Academy of Pediatric, takes a 38-week limit for labeling premature. Premature babies are babies born under 37 weeks or weighing less than 2,500 grams (Manuaba, 2008). Premature babies are babies born at gestational age less than or equal to 37 weeks, regardless of birth weight (Wong, 2008).

Predisposing factors for preterm birth include: Maternal factors, namely a history of previous premature birth, antepartum bleeding, malnutrition, uterine abnormalities, hydromion, heart disease / other chronic diseases, hypertension, maternal age less than 20 years or more than 35 years too close, infection, trauma, habits, namely tiring work, smoking (Prawirohardjo, 2006). Fetal factors, namely: congenital defects, multiple pregnancy, hydramnios, premature rupture of membranes, congenital defects and infections (Prawirohardjo, 2006). Placental factors: Premature births caused by placental factors include: placenta previa, and placental solutions (Surasmi, Handayani, and Kusuma, 2003). Specific factors: incompetent cervix Repetitive preterm labor, uterine overistence, multiple pregnancies, pregnancy with hydramnios (Manuaba et al, 2007) Occurs in multiparous women, due to uterine scarring resulting from previous (repeated) pregnancies and labor (Raymond, 2006).

Babies who are below the 10th percentile are named mild for gestational age. Previously, neonates with a birth weight of less than 2500 grams or equal to 2500 grams are called premature. This weight division is very easy but not satisfying. So that gradually it is known that the level of morbidity and mortality in neonates does not only depend on body weight, but also on the maturity level of the baby itself (Proverawati, 2010).

Nutritional status is an expression of a state of balance in the form of certain variables, or a manifestation of nutriture in certain forms of variables (Supariasa, Bakri and Fajar, 2016). Nutrition is the process of using food that is normally consumed by an organism through the process of digestion, absorption, transportation, storage, metabolism, and the excretion of substances used to maintain life, growth and normal function of organs, and to produce energy (Ariani, 2017).

Kartu Menuju Sehat (KMS) is a card that contains a child's normal growth curve based on an anthropometric index of body weight according to age. KMS can detect growth disorders or the risk of excess nutrition early, so that preventive action can be taken more quickly and precisely before the problem gets worse. Below the red line indicates that the child is moderately to severely malnourished. Located in the area of two yellow bands (above the red line), this indicates that the child is experiencing mild malnutrition. Two light green and two dark green on the yellow band, indicating that the child has sufficient weight or nutritional status is good or normal. Four bands above the dark green color band (2 light green bands plus 2 yellow bands), indicates that the child has a weight that is more than normal.

Methodology

This type of research is a quantitative study with an analytic design with a cross-sectional approach. In this study, the independent variables were low birth weight (LBW) and the dependent variable was weight growth and a history of prematurity.

The population in this study were all three year old babies in 6 posyandu in Ngumbul Village, Tulakan District, Pacitan Regency. The total number of three year old babies in this posyandu is 123 three year old babies,

of the total there are 38 three year old babies who have a history of LBW. The sample in this study was partly three year old babies in Ngumbul Village, Tulakan District, Pacitan Regency, as many as 94 three year old babies. Inclusion criteria : all three-year-old babies who have a history of low birth weight (LBW) are determined by their BB at birth which is recorded in the KIA book in Ngumbul Village, Tulakan District, Pacitan Regency. 2. Exclusion criteria : respondents were not present during the study, the parents of a three year old baby were not willing to be the respondents, the baby's weight is three years more than normal (above the green KMS line). The method used in sampling is simple random sampling method. All three-year-old babies who have a history of normal birth weight are determined by their BB at birth which is recorded in the KIA book in Ngumbul Village, Tulakan District, Pacitan Regency.

Data collection is done by looking at book KIA (Maternal and Child Health) to see a history of low birth weight, and a history of preterm labor. to see the nutritional status using KMS (weight for age). Univariate data analysis was used to describe the characteristic of variables in this study. Bivariate data analyzed by chi-square test to determine the relationship between variables in this study. The statistical test used in this study is the Chi-square test.

Research Result

Table 1. Characteristics of Three-year-old baby in Tulakan Pacitan Village

Variabel	F	%
Age		
12-24 months	60	63,8%
25-36 months	34	36,2%
Gender		
Male	59	62,8 %
Female	35	37,2 %

Based on the table above, it can be seen that most of them are aged 12-24 months as many as 60 three-year-old baby (63.8%), mostly male, 59 three-year-old baby (62.8%).

Table 2. Specific Research Data

Variabel	F	%
Gestasional Ages		
Aterm (37-41 weeks)	75	79,8%
Prematur (<37 weeks)	19	20,2 %
Birth Weight		
LBW	24	25,5%
No LBW	70	74,5%
KMS Colors (weight for age)		
Green	72	76,6%
Yellow/Red	22	23,4%

Based on table 2, it can be seen that most of the three-year-old baby have a history of birth at term / term, aged (37-41 weeks) as many as 69 three-year-old baby (73.4%), most three-year-old baby have a history of normal birth weight as much as 70 (74.5%)) toddler. Most of the three-year-old baby experienced normal weight growth as indicated by the green KMS line as many as 72 three-year-old baby (76.6%).

Table 3. Cross Tabulation of LBW History with Weight Growth in Three-year-old baby in Ngumbul Village, Tulakan District, Pacitan Regency in May 2019

Birth Weight	Nutritional status				n	%	
	Abnormal Nutritional Status		Normal Nutritional Status				
	n	%	n	%			
LBW	18	75%	6	25%	24	100%	
NO LBW	4	5,7%	66	94,3%	70	100%	
Total	22		72		94		
P-value	0,00						

Based on table 3, it is known that the group of three-year-old baby with a history of LBW, most of the nutritional status was abnormal, 18 people (75%). Meanwhile, in the toddler group with a history of not LBW, most of them had normal nutritional status as many as 66 people (94.3%). Data processing to determine the relationship between LBW history and weight growth in three-year-old baby is using the Chi Square Test. Based on the results of the Chi Square test, the p value is obtained = 0.00 < 0.05, so it can be said that there is a relationship with a history of low birth weight (LBW) with the nutritional status of three-year-old baby (1-3 years) in Ngumbul Tulakan Village, Pacitan.

Table 4. Cross Tabulation of Prematurity History and Weight Growth in Three-year-old baby in Ngumbul Village, Tulakan District, Pacitan Regency in May 2019

Prematurity History	Nutritional Status				Total	%	
	Abnormal Nutritional Status		Normal Nutritional Status				
	n	%	n	%			
Prematur	13	68,4%	6	31,6%	19	100%	
Aterm	9	12%	66	88%	75	100%	
Total	22		72		94		
P-value	0,000						

Based on table 4, it can be seen that in the toddler group with a history of prematurity, most of the nutritional status was abnormal, 13 people (68.4%). While in the toddler group with a history of term, most of them had normal nutritional status as many as 66 people (88%). The statistical test used to determine the relationship between LBW history and weight growth in three-year-old baby did not meet the requirements of the Chi Square test, so using the Fisher exact test. Based on the results of statistical tests, the value of p = 0.000 < 0.05, it can be said that there is a relationship between history of prematurity and nutritional status in three-year-old baby (1-3 years) in Ngumbul Tulakan Village, Pacitan.

Discussion

Based on the results of research that most three-year-old baby have a history of normal birth weight. Low birth weight (LBW) is the weight of babies born less than 2500 grams regardless of gestation or gestational age (Saputra, 2014). The causes of LBW include: maternal factors, maternal habit factors, fetal factors (premature, hydramnios, etc.) and environmental factors. The categorization of LBW babies is divided into three, namely low birth weight babies (LBW) with a birth weight of 1500-2500 grams, very low birth weight babies (LBW) with a birth weight of 1000-1500 grams, extremely low birth weight babies (LBW) with heavy birth weight. born less than 1000gram. Long-term problems that can arise in babies with low birth weight (LBW) are developmental disorders, growth problems, visual disturbances (retinopathy), hearing loss, chronic lung disease, increased morbidity and frequent hospital admissions, and increased frequency. congenital abnormalities (Sembiring, 2017).

Babies with a history of LBW in Ngumbul Tulakan Pacitan Village are three-year-old baby with a history of preterm birth, data obtained from 24 respondents who had a history of LBW, there were 16 three-year-old baby born prematurely. Babies born prematurely cause LBW because they do not have time to experience the rapid growth that occurs in the final trimester of pregnancy, so babies born prematurely tend to have low weight and small bodies. Meanwhile, a small proportion of respondents who have a history of LBW can occur due to other factors not assessed by the researcher. For three-year-old baby with a history of LBW but normal weight growth of 6 children (25%), this was due to other factors such as toddler nutrition, genetic factors, parenting styles, etc. which were not studied by the researcher.

Based on table 2, most of the three-year-old baby had a history of childbirth at term. Premature babies are babies born alive before the 37th week of gestation (counting from the first day of last menstruation). Preterm birth has been defined as any birth before 37 weeks completed weeks of gestation. The World Health Organisation (WHO) defines preterm birth as any birth before 37 completed weeks of gestation, or fewer than 259 days since the first day of the woman's last menstrual period (Howson et al, 2012)

The predisposition for premature birth includes maternal factors such as family history of preterm birth, low socio-economic status, low educational attainment, maternal age (low and high), ethnicity, stress, depression, tobacco use, low body mass index, infection (genitourinary or extra genital, periodontal disease, uterine anomalies, history of cervical excisional procedures/surgery (LEEP/conization). Reproductive history: prior preterm birth, prior stillbirth/pregnancy loss > 16 weeks GA, induced abortion cerviva; insufficiency. Current pregnancy characteristics : vaginal bleeding, use of assisted reproductive technologies, multiple gestation, polyhydramnios, short cervical length (H. A. Frey and M. A. Klebanof, 2016 and B. Koullali, M. A. Oudijk, T. A. Nijman, B. W. Mol, and E. Pajkrt, 2016)

Children born premature also had high rates of undernutrition. Stunting was seen in these children at rates nearly double the national stunting prevalence of 41% among rural Rwandan children. Levels of wasting and underweight were more than triple the Rwandan rural prevalence (2% wasted and 10% underweight nationally) among children under-five. These results could have been compounded by the high rates of reported health problems (Adam-Chapman, 2013). Furthermore, poor maternal nutrition, a main contributor to IUGR, is also important to note as nearly half of the children were SGA at birth (Kirk et al, 2017)

From the results of research conducted from 94 respondents, Most of the three-year-old baby experienced normal weight growth as indicated by the green KMS line. Factors that can affect a child's nutritional status, especially from body weight (BW) include: genetics, nutritional intake (nutrition), gender, age, comorbidities during infancy, history of LBW, family factors, socio-economic factors (type of economic activity , income, education level, type of residence, and position in the organization) and environmental factors (Yuniarti, 2015). An important period in child development is at the age of under five years. Because at this time the basic growth will influence and determine the next child's development. Problems that occur if there is an obstacle to growth will have an impact on the future, for example, children with less than normal body weight will experience various health problems and growth disorders. (WHO, 2014). This result is in accordance with the research conducted by Rohmah et al., With the journal title, the factors associated with the incidence of growth failure in children aged 6-24 months in the coastal areas of Semarang are energy intake, protein, zinc, vitamin C, and a history of LBW.

Three-year-old baby who experience malnutrition in Ngumbul Tulakan Pacitan Village are caused by several factors, among others: Babies with a history of LBW, from the observation sheet it can be seen that of the 22 three-year-old baby who experience growth restriction 18 of them have a history of LBW. Three-year-old baby who have a history of LBW and have experienced intra-uterine retardation since birth, have limitations in digestion because digestion has not functioned optimally. There are 4 three-year-old baby with underweight but no history of LBW (5.7%), this is due to other factors such as genetic factors, parenting style, comorbidities of three-year-old baby, and insufficient nutritional intake.

Based on the results of statistical tests using the Chi Square analysis test, the p value = 0.00 < α = 0.05. If sig < 0.05 then H0 is rejected H1 is accepted, so it can be concluded that there is a relationship with a history of low birth weight (LBW) with the nutritional status of three-year-old baby (1-3 years) in Ngumbul Tulakan Village, Pacitan.

Babies with a history of low birth weight (LBW) can grow and develop more slowly because LBW babies have experienced inter-uterine growth retardation and will continue to the next age after birth. In children with a history of LBW, growth will be slower than normal-born babies, and often fail to keep up with the growth rate that he should have reached at the age after birth. Children with a history of low birth weight (LBW) also experience digestive tract disorders, because the digestive tract is not yet functioning, such as not being able to absorb fat and digest protein resulting in a lack of nutrient reserves in the body (Proverawati, 2010). This result is consistent with the research conducted by Rohmah et al., In Tambak Lorok Semarang, which found that low birth weight was the dominant risk factor for growth failure. Another study that obtained the same results as this was a study conducted by Nengsih in 2016 which stated that there was a relationship between the birth history of LBW and the nutritional status of three-year-old baby in the PKM Rancaekek working area.

Three-year-old baby with a history of low birth weight (LBW) are related to the nutritional status of three-year-old baby in Ngumbul Tulakan Village, Pacitan. Based on the results of observations made by researchers, of the 24 three-year-old baby who had a history of LBW, 18 of them had low nutritional status, because three-year-old baby with a history of LBW had a dominant risk of developing failure in children.

Based on the results of statistical tests, the value of $p = 0.000 < 0.05$, it can be said that there is a relationship between history of prematurity and nutritional status of three-year-old baby (1-3 years) in Ngumbul Tulakan Village, Pacitan.

Based on the results of research conducted by Ntenda (2019), it is revealed that a strong positive association between LBW and undernutrition among preschool-aged children in Malawi. For instance, the risk of being stunted (57%), underweight (15%) and, wasted (51%) in the course of the early childhood years were found to be higher in children with LBW than in those with normal birth weights even after controlling for other known risk factors for childhood undernutrition in models. Thus, children who have LBW are at increased risk to remain undernourished in the course of the early years of their childhood even after controlling for the child's biological, child's health, maternal/households, household environmental, healthcare utilization and community characteristics. This is in line with research conducted by Rahman et al. (2016)

Relationship between preterm and child status The results of the analysis which assessed the relationship between the incidence of prematurity and nutritional status indicated that there was a relationship between the history of preterm labor and the nutritional status of the child. According to Wong et al. (2009) stated that the normal birth weight of children at the age of 1 year is 3 times the birth weight. growth problems for children born prematurely for 3 to 5 months.

For instance, in Malawi increased odds of stunting and underweight were found among children with perceived small sizes at birth than average birth sizes (Ntenda, 2018). Similarly, in a study of infant growth patterns and their relations to birth weight in Bangladesh found that birth weight was the most essential predictor of succeeding growth status for the period of infancy (Rahman et al,2016). Several epidemiological studies have reported that children with perceived small sizes at birth are often born from households with low socioeconomic status and poor maternal health conditions (i.e. maternal undernutrition).

Based on research conducted by Rahman et al (2016) once a baby is born underweight, the risk of becoming malnourished during the first five years of life is higher compared to a baby of normal birth weight even if the mother is educated, household socio-economic conditions are good, and the preceding birth interval is long. This may be one explanation as to why prevalence of malnutrition has remained high in Bangladesh during the last decade despite marked improvements with respect to each of these factors over the same period.

Conclusion

There are 24 three-year-old babies with a history of low birth weight (LBW) in Ngumbul Tulakan Village, Pacitan (25.5%). Three-year-old babies with a history of premature were 20.2% (as many as 19 three-year-old baby) in Ngumbul Tulakan Pacitan village. The nutritional status of three-year-old babies in the village of Gumbul Tulakan, Pacitan, is mostly normal (76.6%). There is a relationship between the history of LBW and the nutritional status of three-year-old babies in Ngumbul Tulakan Village, Pacitan with a value of ρ value of

0.00. There is a relationship between a history of prematurity and the nutritional status of a three year old baby in Ngumbul Tulakan Village, Pacitan with a value of ρ value of 0.00.

Health workers further improve ANC and posyandu services to prevent LBW and wasting so that each family member has a good nutritional status. Pregnant women can avoid the risk of LBW and premature birth by avoiding factors that cause LBW such as smoking pregnant women, pregnant women with complications, pregnant women with hypertension etc. Pregnant women are advised to meet their nutritional and vitamin needs so that pregnancy anemia does not occur. Mothers are advised to regularly go to the posyandu to monitor the growth and development of their three-year-old baby, and to provide adequate nutrition for their three-year-old baby.

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