**International Journal of Health Science and Technology** e-ISSN 2685-8673
Vol. 4, No. 2 (2022), pp. (166-173)

*10.31101/ijhst.v4i2.2787*

**Original Research Papers**

# The relationship between low birth weight (LBW) and the level of maternal knowledge about nutrition with the incidence of stunting in toddlers

**Meilinda Rifka Novita, Sarwinanti***
Universitas 'Aisyiyah Yogyakarta, Indonesia
sarwinantisyamsudin@yahoo.com

Submitted: July 3, 2022 Revised: July 18, 2022 Accepted: August 2, 2022

## Abstract
Low Birth Weight (LBW) is the weight of a baby at birth less than 2,500 grams (up to 2,499 grams). This study aimed to determine the relationship between low birth weight (LBW) and the level of maternal knowledge about nutrition with the incidence of stunting in toddlers. This study uses a correlation study method with retrospective and cross-sectional designs. The population in this study was stunting toddlers, and mothers who had stunting toddlers totaled 127 people with purposive sampling techniques obtained a total sample of 55 people. The instrument used in this study was a questionnaire—data analysis using Kendall's tau test. The results showed p-value of 0.032 and 0.618 for low LBW and the level of maternal knowledge about nutrition with stunting incidence. This study concludes that there is a significant relationship between low birth weight (LBW) and stunting incidence in toddlers, and there is no relationship that there was no meaningful relationship between the level of maternal knowledge about nutrition and the incidence of stunting in toddlers at the Tepus I Health Center.

**Keywords:** LBW; mother's level of knowledge; nutrition of toddlers; stunting

## 1. Introduction

Stunting is the most common problem in developing countries, including Indonesia. Stunting (dwarf) is a condition where toddlers have a less height and are unsuitable for their age. This condition is measured by length or height that is more on maximum physical and cognitive development (Kurnia et al., 2020). According to the United Nations International Children's Emergency Fund (UNICEF), one in three children is stunted. Forty percent of children in rural areas experience stunted growth. The consequences of stunting can be short-term and long-term, including increased mortality and mortality, poor child development and affected learning development, increased risk of infection and non-communicable diseases in adulthood, and reduced productivity (Choliq et al., 2020).

Based on data from the World Health Organization (WHO), the percentage of stunting toddlers globally in 2019 reached 21.3% (Ministry of Health, 2020). Based on the World Bank Group Joint Malnutrition Estimates, UNICEF, and WHO in 2019, seven high and very high stunting prevalences include Oceania (38.4%), East Africa (34.5%), South Asia (31.7%), Central Africa (31.5%), South Africa (29.0%), West Africa (27.7%) and Southeast Asia (24.7%). The results of the 2018 Basic Health Research (Riskesdas) showed a prevalence of stunting at the national level of 30.8% (Kurnia et al., 2020).

The province of Yogyakarta Special Region is included in the high number of stunting. Based on the report of the Nutrition section of the DIY Health Office 2020, the prevalence of short toddlers in Yogyakarta in 2018 was 12.37%, and this figure fell to 10.69% in 2019, then increased again in 2020 to 11.08% (Dinkes

DIY, 2020). The most considerable prevalence of short toddlers in Yogyakarta is Gunungkidul, with a rate of 17.43%, and the lowest majority is in Sleman, with 7.24%. The stunting rate in Gunungkidul reached 17.43%, with the highest data at the Tepus I Health Center as much as 28.48%.

Low Birth Weight (LBW) is the weight of a baby at birth less than 2,500 grams (up to 2,499 grams). Based on the report of the Nutrition section of the DIY Health Office (Dinkes DIY, 2020), the LBW figure in 2020 reached 6.12%, with the highest LBW figure in Gunungkidul Regency as much as 7.05%. The high number of LBW cases triggers stunting events in Indonesia, meaning that stunting cases are still a threat and health problems that need to be watched out for. LBW is one factor contributing to the high AKB, so Indonesia has not been able to achieve the SDGs target (Ministry of Health, 2018).

The government's efforts in handling are stunting cases in Indonesia by making stunting one of the priority programs in one of the Sustainable Development Goals (SDGs) targets, namely eliminating hunger and all forms of malnutrition by 2030 and achieving food security. The target set is to reduce stunting by 40% by 2025. The Policy Direction of the National Medium-Term Development Plan (RPJMN) in the health sector for 2020–2024 is to improve access to quality health services towards universal health coverage with an emphasis on strengthening primary health care and increasing promotional and preventive efforts supported by innovation and the use of technology.

People's assumptions about LBW problems show that they are worried and afraid of health problems that will occur in children, expensive care costs, and babies' low life expectancy (Hariani, 2019). In addition, people think that stunting is a genetic and hereditary factor. The incidence of stunting due to hereditary factors is around 5%, and the rest is due to nutritional intake, maternal knowledge level, parenting patterns, and environmental sanitation conditions (Avrianti, 2018).

Nutrition knowledge can affect mothers' attitudes or ignorance about nutrition, which will impact the growth and development of their toddlers, who will experience growth disorders such as stunting (Senudin, 2021). To get good nutrition, parents must have good nutritional knowledge, such as selecting a balanced menu. Parents with low expertise will need help choosing healthy, nutritious foods for their children. The mother's lack of knowledge about the diversity of ingredients and food types will disrupt toddlers' growth and development process, especially brain development. Therefore it is essential to provide nutritious food intake to her child. Parents, especially mothers, ignore nutritional information in their toddlers. Children under five are susceptible to disease and infection (Nurma Yuneta et al., 2019).

This study aimed to determine the relationship between low birth weight (LBW) and the level of maternal knowledge about nutrition with the incidence of stunting in toddlers. A preliminary study conducted at the Tepus I Health Center found that at the Tepus I Health Center in 2020, there were 127 stunting toddlers, or 28.48% of the total 446 toddlers. Within the scope of the Tepus I Health center, 30 Posyandu are spread across two villages, namely Sidoarjo and Sumberwungu villages. The main factors behind stunting at Tepus I Health center are diet, the weight of the baby, and environmental factors. Based on the results of the preliminary study, it is essential to research the relationship between low birth weight (LBW) and the level of maternal knowledge about nutrition with the incidence of stunting in toddlers at the Tepus I Health Center so that things that correlate with the incidence of stunting are known.

## 2. Research Methods

The design of this study is quantitative research with a correlation study method with a retrospective approach for LBW variables and a cross-sectional approach for variables on the level of maternal knowledge about nutrition. The sampling technique uses Nonprobability Sampling with the Purposive Sampling method. The number of respondents was 55. The research instrument uses questionnaire sheets,

medical records of Tepus I Health center, and MCH books owned by toddlers. To get the number of respondents, there are two criteria, namely, first, inclusion criteria which include stunted toddlers residing in the Tepus I Health center area, education for toddler mothers at least junior high school, babies who are given exclusive breastfeeding, family income Rp.500,000–Rp.1,500,000, maternal age when pregnant 20-35 years, toddlers living with their parents and toddlers who have MCH / KMS.
The second criterion is the exclusion criteria, toddlers residing outside the Tepus I Health center area and toddlers with special needs/congenital disabilities.

## 3. Results and Discussion

### 3.1. Results

This study was conducted at the Tepus I Health Center with 55 respondents who had stunting toddlers. Primary data were obtained through a questionnaire sheet on the level of maternal knowledge about nutrition given directly to respondents. The secondary data uses Tepus I health center data regarding stunting toddlers and MCH books owned by toddlers.

**Table 1.** Frequency distribution of respondents' characteristics in the working area of Tepus I Health center (n=55)

| No | Characteristic | Frequency (f) | Percentage (%) |
|---|---|---|---|
| 1 | Mother's Education | | |
| | SMP | 24 | 43.6 |
| | SMA/K | 26 | 47.3 |
| | Bachelor | 5 | 9.1 |
| 2 | Work | | |
| | Official | 4 | 7.3 |
| | Employee | 7 | 12.7 |
| | Civil servants | 5 | 9.1 |
| | Merchant | 34 | 61.8 |
| | Tailor | 5 | 9.1 |
| 3 | Gestational age | | |
| | 21-25 tahun | 19 | 34.5 |
| | 26-30 tahun | 15 | 27.3 |
| | 30-35 tahun | 21 | 38.2 |
| 4 | Income | | |
| | ≤ 1 juta | 39 | 70.9 |
| | ≥1 juta | 16 | 29.1 |
| 5 | Genetic | | |
| | Not flawed | 55 | 100 |
| 6 | Parenting | | |
| | Living with parents | 55 | 100 |
| 7 | Breast milk | | |
| | Exclusive breastfeeding for six months | 55 | 100 |
| | **Total** | **55** | **100** |

Source: Primary Data, 2022

Based on table 1 of the frequency distribution of respondents' characteristics at the Tepus I Health Center, it can be seen that most of the mothers are educated at the end of high school / K as many as 26 (47.3%), the majority mother's occupation as a trader is 34 (61.8%), the gestational age of the majority mother is 30-35 years as much as 21 (38.2%), most of them earn ≤1 million rupiah as much as 39 (70.9%), all toddlers who are made respondents are not disabled, parenting style lives with parents and exclusive breastfeeding for six months as many as 55 (100%).

**Table 2.** Distribution of the frequency of birth weight at the Tepus I Health Center

| No | Baby Birth Weight | Frequency (f) | Percentage (%) |
|---|---|---|---|
| 1 | LBW (≤ 2500 grams) | 44 | 80 |
| 2 | Not LBW (≥ 2500 gram) | 11 | 20 |
| | **Total** | **55** | **100** |

Source: Primary Data 2022

Based on table 2 of the distribution of birth weight frequency, most respondents experienced a history of low birth weight (LBW) as much as 44 (80%), and a small percentage did not experience LBW as much as 11 (20%).

**Table 3.** Frequency distribution of maternal knowledge levels about toddler nutrition at Tepus I Health Center

| No | Knowledge Level | Frequency (f) | Percentage (%) |
|---|---|---|---|
| 1 | Good | 42 | 76.4 |
| 2 | Sufficient | 13 | 23.6 |
| | **Total** | **55** | **100** |

Source: Primary Data 2022

Based on table 3 of the frequency distribution of the level of maternal knowledge about toddler nutrition, it can be seen that most mothers have a good level of knowledge, as much as 42 (76.4%), and those with a sufficient level of knowledge as much as 13 (23.6%).

**Table 4.** Distribution of stunting frequency in Tepus I Health Center

| No | Stunting Incidents | Frequency (f) | Percentage (%) |
|---|---|---|---|
| 1 | Short | 14 | 25.5 |
| 2 | Very Short | 41 | 74.5 |
| | **Total** | **55** | **100** |

Source: Primary Data 2022

Based on table 4 of the distribution of the frequency of stunting data, it is known that most of the toddlers in Tepus I Health Center experienced stunting with a very short category (< -3 elementary school) as many as 41 (74.5%) and stunting with a short category (-3 elementary school to -2 elementary school) as many as 14 (25.5%).

**Table 5.** Description of the correlation of low birth weight (LBW) with stunting incidence at Tepus I Health Center

| Baby Birth Weight | Stunting Incidents | | | | Sum | | P-Value | *r* |
|---|---|---|---|---|---|---|---|---|
| | Short | | Very Short | | | | | |
| | F | % | F | % | F | % | | |
| LBW | 14 | 25.5 | 30 | 545 | 44 | 80.0 | 0.032 | 0.292 |
| Not LBW | 0 | 0.0 | 11 | 20.0 | 11 | 20.0 | | |
| Total | 14 | 25.5 | 41 | 74.5 | 55 | 100 | | |

Source: Primary Data 2022

Table 5 shows that the highest percentage is the birth weight of LBW category babies with a very short stunting incidence of 30 people (54.5%), while LBW with a short stunting incidence of 14 (25.5%). The weight of babies born in the non-LBW category with a very short stunting incidence of 11 (20.0%). Based on the results of the Kendall Tau test showed that between LBW and stunting incidence in toddlers obtained a p-value=0.032<0.05. So it can be concluded that there is a significant relationship between LBW and the incidence of stunting in toddlers at the Tepus I Health Center with sufficient relationship coefficient values.

**Table 6.** Description of the correlation of maternal knowledge levels about nutrition with the incidence of stunting at Tepus I Health Center

| Mother's Knowledge Level | Stunting Incidents | | | | Sum | | P *Value* | *r* |
|---|---|---|---|---|---|---|---|---|
| | Short | | Very Short | | | | | |
| | F | % | F | % | F | % | | |
| Good | 10 | 18.2 | 32 | 58.2 | 42 | 76.4 | 0.618 | -0068 |
| Sufficient | 4 | 7.3 | 9 | 16.4 | 13 | 23.6 | | |
| Less | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | | |
| Sum | 14 | 25.5 | 41 | 74.5 | 55 | 100 | | |

Source: Primary Data 2022

Based on Table 6 shows that the highest percentage is the level of knowledge of mothers in the excellent category with a very short stunting incidence of 32 (58.2%), the level of knowledge of mothers in the superb variety with the incidence of short stunting as much as 10 (18.2%). At the same time, there is no level of knowledge of mothers in the category lacking with the incidence of stunting in toddlers at the Tepus I Health Center.

The Kendall test results show that between the level of maternal knowledge and the incidence of stunting in toddlers, a p-value is obtained=0.618>0.05. So it can be concluded that there is no significant relationship between the level of maternal knowledge about nutrition and the incidence of stunting in toddlers at the Tepus I Health Center.

## 3.2. Discussion

### 3.2.1. The Relationship Between a History of Low Birth Weight (LBW) and the Incidence of Stunting in Toddlers

Based on the results of LBW research and the incidence of stunting in toddlers at the Tepus I Health Center, 44 toddlers with LBW are included in the LBW category with a very short stunting incidence of 30 (54.5%), LBW with a short stunting incidence of 14 (25.5%). Meanwhile, the non-LBW category has a

very short stunting incidence of 11 (20.0%), and no LBW category has a short stunting incidence. The statistical test results obtained a correlation value (r)=0.292 and p-value=0.032. These results show a relationship between the history of LBW and the incidence of stunting in toddlers at the Tepus I Health Center.

The results of this study are in line with research conducted by Afif de Alba., et al. at the Sekupang Health Center in Batam city (2019), which showed as many as 62 toddlers, mostly with LBW with 25 toddlers (40.3%) and stunted toddlers totaling 40 toddlers (64.5%). The results of this study are also in line with the research conducted by Avrianti (2018), in Tegalrejo village. This study showed 14 toddlers with a history of LBW (25.93%). The results of this study are also in line with the research of Supriyanto et al. (2017), where 85 people (45%) were obtained from low birth weight (45%).

Birth weight can indicate the possibility of the child's survival, growth, long-term health, and psychological development. Assessment of nutritional status using anthropometry in newborns by measuring the baby's weight, body length, upper arm circumference, and head circumference is a nutritious method to study newborns, which significantly affects the morbidity and mortality of babies at a later age (Supriyanto et al., 2017).

The results of this study are in line with research conducted by Nasution (2013), that LBW, since in the womb, has undergone intrauterine growth retardation and will continue until the next age after birth, namely experiencing slower growth and development than babies born normally and often fail to follow the growth rate that should be achieved at their age after birth. This research is supported by research by Lestari et al. (2018) that the history of LBW has a 12 times greater risk of stunting than babies with normal birth weight and is supported by research by Supriyanto et al. (2018) that there are significant results between LBW and stunting incidence, LBW is six times greater to experience stunting than children who have normal weight.

LBW is influenced by several maternal factors such as economic history, maternal age, nutritional history and parity, bad pregnancy history, poor ANC, and lack of care during pregnancy that can affect the baby (Hartiningrum & Fithriyah, 2018). LBW describes health and nutritional conditions and shows the survival rate and psychosocial progress. The impact of babies with low birth weight will occur from generation to generation. Children with LBW lack anthropometric measures in their development. Besides, birth weight is generally strongly associated with fetal mortality, neonatal and postnatal death, infant morbidity, and long-term growth and development in children (Rahayu et al., 2015 in Rohana Sinaga et al., 2021).

A study conducted by Rohana Sinaga et al. (2021) assumed that LBW has consequences for the future of children, which fails the growth and development of toddlers. To prevent failure in the growth and development of toddlers, it is necessary to minimize various risk factors, such as pursuing child growth and development so that the child's growth and development are good or normal. Birth weight generally has a lot to do with long-term growth and development. So the impact of LBW can be in the form of failure to grow (growth faltering). A baby born with LBW will find it difficult to catch up with early growth. The change that lags behind normal will cause the child to grow stunted (Oktarina 2012, in Murti et al., 2020). In addition to LBW, several factors that can affect stunting are genetic factors or heredity from parents, fulfillment of nutrition, maternal factors such as working mothers, the mother's age during pregnancy, and income from the family. At the Tepus I Health Center, toddlers are still stunting because of LBW, which is likely to happen because the mother's gestational age is, on average, 30-35, so the condition of the mother's pregnancy also greatly affects the baby to become LBW.

### 3.2.2. The Relationship between Mothers' Level of Knowledge about Nutrition and the Incidence of Stunting in Toddlers

Based on the research results on the level of maternal knowledge and the incidence of stunting at the Tepus I Health Center, 42 mothers with good knowledge have stunting toddlers with a very short category of 32 (58.2%) and with a short category of 10 (18.2%). Meanwhile, 13 mothers with sufficient knowledge have stunting toddlers, with a very short category of 9 (16.4%) and a short category of 4 (7.3%). The correlation value (r)=-0.068 and p value 0.618 were obtained based on the statistical test results. The results showed no relationship between maternal knowledge about nutrition and the incidence of stunting in toddlers at the Tepus I Health Center.

Factors that affect mothers' knowledge are participating in posyandu activities every month, reading magazines, and information about the nutritional knowledge of toddlers, so that mothers' knowledge increases. Lack of maternal knowledge is caused by a lack of counseling from health workers and having an active job outside the home, so to get nutritional knowledge is still lacking (Junaid et al., 2018). This is in line with the opinion (Chasnah, 2019) that knowledge comes from the senses and experiences that have been processed by reason and arise spontaneously. Sensing occurs through the five human senses: sight, hearing, smell, taste, and groping.

Mother's knowledge is key in household management, affecting the mother's attitude in choosing the food ingredients consumed. Mothers with good nutritional knowledge can understand the importance of good nutritional status for health and well-being (Chasnah, 2019).

The results of this study are not in line with the research of Olsa et al. (2018) in Nanggalo District, which showed that respondents had sufficient knowledge, namely 113 people (48.7%), good knowledge of 59 people (25.4%) and knowledge of less than 60 people (25.9%). The low incidence of stunting in this study can be caused by several factors, namely the level of education of mothers who are already included in the good category, maternal occupation, number of children and location of residence as well as maternal attitudes and knowledge, most of which are included in the good category. This is also the same as Ningtyas et al. (2020) research, which showed that the proportion of stunted toddlers with mothers who have insufficient nutritional knowledge is (52.3%). The proportion of stunted toddlers with mothers with good nutritional knowledge is (16.9%).

This research is in line with Chasnah's study (2019), that maternal knowledge about toddler nutrition that mothers have is not applied in everyday life. As a mother, she must be able to choose foodstuffs that have high nutritional value at affordable prices. In addition, mothers must also take time to pay attention to their children. Thus, the child will be fulfilled regarding nutritional needs and sufficient attention from a mother. At Tepus I Health Center, mothers' knowledge about nutrition is almost all good, but because mothers work, they are not paying attention to their children, so the child's nutritional needs are not fulfilled.

## 4. Conclusion

The conclusion of this study is 44 stunting toddlers with a history of LBW and 11 stunting toddlers without a history of LBW. Forty-two mothers have a good level of knowledge, and 13 mothers have a sufficient level of knowledge. There is a significant relationship between LBW and toddler stunting incidence (p=0.032). Still, there is no relationship between the level of knowledge and the incidence of stunting in toddlers at the Tepus I Health Center (p=0.618).

## References


Avrianti (2018) *Hubungan Berat Badan Lahir Rendah (LBW) dengan Kejadian Stunting pada Balita Usia 24-59 Bulan di Kelurahan Tegalrejo*. Universitas 'Aisyiyah Yogyakarta.

Chasnah, N. A. (2019) *Hubungan Tingkat Pengetahuan dan Pekerjaan Ibu dengan Status Gizi Balita di Posyandu Mekarsari Desa Genting Jambu Kabupaten Semarang*. Universitas 'Aisyiyah Yogyakarta.

Choliq, I. *et al*. (2020) *Pencegahan Stunting Di Medokan Semampir Surabaya Melalui Modifikasi Makanan Pada Anak*. Available at: http://journal.um-surabaya.ac.id/index.php/HMN.

Dinas Kesehatan DIY (2020) 'Profil kesehat Provinsi DIY Tahun 2020'.

Hariani, P. A. (2019) *Hubungan Status Gizi dan Pekerjaan Ibu Hamil dengan Kejadian Bayi Berat Lahir Rendah (LBW) di RSUD Wates Yogyakarta Tahun 2016-2018*. Universitas 'Aisyiyah Yogyakarta.

Hartiningrum, I. and Fithriyah, N. (2018) 'Berat Badan Lahir Rendah (LBW) di Provinsi Jawa Timur tahun 2012-2016)', *Jurnal Biomedika dan Kependudukan*, 7, p. 2.

Junaid, Laila, D. and Zainuddin, A. (2018) 'Hubungan Antara Pengetahuan Ibu dan pola Makan Terhadap Status Gizi Balita di Wilayah Kerja Puskesmas Mokoau Kota Kendari', *Jurnal Ilmiah Mahasiswa Kesehatan Masyarakat*, 3, p. 2.

Kemenkes (2018) 'Kementrian Kesehatan Badan Penelitian dan Pengembangan Kesehatan'. Jakarta ; Badan Penelitian dan Penelitian dan Pengembangan Kesehatan Departemen Kesehatan Republik Indonesia.

Kementrian Kesehatan (2020) 'Situasi Stunting di Indonesia', *Jendela data dan informasi kesehatan*, 208(5), pp. 1–34.

Kurnia, H. *et al*. (2020) 'Asi Eksklusif Dengan Kejadian Stunting Pada', 10(2), pp. 62–69.

Murti, F. C. *et al*. (2020) 'Hubungan Berat Badan Lahir Rendah (Lbw)Dengan Kejadian Stunting Pada Balita Usia 2-5 Tahun Di Desa Umbulrejo Kecamatan Ponjong Kabupaten Gunung Kidul', *Jurnal Ilmiah Kesehatan Keperawatan*. STIKES Muhammadiyah Gombong, 16(2), p. 52. doi: 10.26753/jikk.v16i2.419.

Ningtyas, Y. P. *et al*. (2020) 'Pengetahuan Ibu Berhubungan Dengan Stunting Pada Balita Di Wilayah Kerja Puskesmas Karangayu Kota Semarang', 8(1). Available at: http://ejournal3.undip.ac.id/index.php/jkm.

Nurma Yuneta, A. E. *et al*. (2019) 'Hubungan Antara Tingkat Pengetahuan Ibu Dengan Status Gizi Balita Di Kelurahan Wonorejo Kabupaten Karanganyar', *PLACENTUM: Jurnal Ilmiah Kesehatan dan Aplikasinya*, 7(1), p. 8. Doi: 10.20961/placentum.v7i1.26390.

Olsa, E. D., Sulastri, D. and Anas, E. (2018) 'Hubungan Sikap dan Pengetahuan Ibu Terhadap Kejadian Stunting pada Anak Baru Masuk Sekolah Dasar di Kecamanatan Nanggalo', *Jurnal Kesehatan Andalas*, 6(3), p. 523. doi: 10.25077/jka.v6i3.733.

Rohana Sinaga, T. *et al*. (no date) *Berat Badan Lahir Rendah Dengan Kejadian Stunting Pada Batita*. Available at: http://journal.stikeskendal.ac.id/index.php/PSKM.

Senudin, P. K. (2021) 'Tingkat Pengetahuan dan Sikap Ibu Balita Tentang Gizi Terhadap Kejadian Stunting Di Desa Belang Turi, Manggarai, NTT', *Jurnal Kesehatan Saelmakers PERDANA*, 4(1), pp. 142–148.

Supriyanto, Y. *et al*. (2017) 'Berat badan lahir rendah berhubungan dengan kejadian stunting pada anak usia 6-23 bulan', pp. 23–30.