Advances in Healthcare Research
Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

Determinants of Factors Influencing Low Birth Weight (BBLR) on The Growth of Babies Aged 1-6 Months

Aisya Ratna Billa Dhayundra Putri Rajjata [1*] Noor Azizah [2] Ummi Kulsum [3]

[1] Universitas Muhammadiyah Kudus, Kudus, Indonesia. Email: 420221700l7@std.umku.ac.id

ARTICLE HISTORY

Submitted	:	December 12, 2025
Reviewed	:	January 05, 2026
Revised	:	February 14 , 2026
Accepted	:	February 17, 2026
Published	:	February 28, 2026

Conflict of Interest Statement:
The author(s) declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

ABSTRACT

Purpose: This study aims to determine the relationship between the determinants of BBLR factors and the growth of babies aged 1–6 months in the working area of the Kaliwungu Health Center, Kudus Regency.

Research Method: The study used an observational analytical design with a rhetorative approach with a total sampling technique in infants aged 1–6 months who had a history of BBLR. Data were collected through medical records and observation sheets, including maternal characteristics (age, education, occupation, parity, preterm gestational age), pregnancy complications (KEK, anemia, preeclampsia, anxiety), and baby growth based on body weight, then analyzed univariate and bivariate using Fisher's Exact Test.

Results and Discussion: The results showed no statistically significant relationship between maternal characteristics and pregnancy complications or baby growth ($p > 0.05$). Most BBLR babies show normal growth according to age-based weight indicators, although there are variations, such as catch-up growth, and the need for follow-up monitoring.

Implications: It was concluded that maternal factors do not significantly affect the growth of BBLR babies, so it is still necessary to prevent and optimally monitor pregnancy and baby growth.

Keywords: BBLR; baby growth; maternal factors.

1. Introduction

The Infant Mortality Rate (AKB) is one of the important indicators to assess the health level of a country. The higher the AKB, the lower the quality of public health in the country. In the Sustainable Development goals (Sustainable Development Goals/SDGs), target 3.2 focuses on reducing the neonatal mortality rate to less than 12 per 1,000 live births, and the infant mortality rate to less than 25 per 1,000 live births by 2030. The main factors causing infant mortality are perinatal disorders and Low Birth Weight (BBLR). mentioned that about 60–80% of infant deaths in developing countries, including Indonesia, are caused by BBLR. Data from the Indonesian Demographic and Health Survey (SDKI) also shows that 35.2% of neonatal deaths are related to BBLR conditions (Harum & Perdana, 2025).

Low Birth Weight (BBLR) is a condition when a baby is born weighing less than 2,500 grams, regardless of gestational age. The main cause of BBLR is usually related to premature birth or the presence of fetal growth retardation during pregnancy WHO (2025). WHO estimates that about 15–20% of births worldwide fall into the BBLR category, with more than 20 million cases each year. Of these, about 95% occur in low- and middle-income countries. Regionally, the highest prevalence is in South

Advances in Healthcare Research
Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

Asia at 28%, followed by Sub-Saharan Africa at 13%, and East Asia and the Pacific at 6%. In the Southeast Asian region, Indonesia still shows a fairly high BBLR rate. Based on data Indonesian Nutrition Status Survey (SSGI) in 2022, the prevalence of BBLR in Indonesia reached 6.0% (SSGI, 2022). In addition, WHO and UNICEF estimates that the premature birth rate in Indonesia is in the range of 10%(Gemilastari et al., 2024) By Globally, about 15.5% or the equivalent of 20 million babies each year are born with a weight below normal standards. The majority of cases of Low Birth Weight (BBLR), which is around 95.6%, occur in developing countries, with 18.3% of them in the Asian region.

Anxiety is an obscure and pervasive worry associated with feelings of insecurity and powerlessness. Anxiety is the formation of various mixed emotional processes that occur when a person experiences various pressures or tensions. Fear is different from anxiety, which is an intellectual assessment of danger. Anxiety is an emotional response to that judgment. Causes of Anxiety Feelings of anxiety can arise from two causes, namely the anxiety that occurs and is realized, such as fear, surprise, helplessness, guilt (Wigati et al., 2023).

In Indonesia, based on data from the Indonesian Demographic and Health Survey (SDKI)) in 2017, the infant mortality rate (AKB) was reported at 22 per 1,000 live births, while the neonatal mortality rate (AKN) reached 15 per 1,000 live births. Babies with low birth weight have a greater risk of death or pain compared to babies of normal weight, both in the neonatal, infancy, and early childhood periods (Harum & Perdana, 2025). In the Health Profile of Central Java in 2023 (Central Java Health Office, 2023), it can be seen that the percentage of babies with low birth weight (BBLR) in the Central Java region varies quite a bit between districts/cities. The highest percentage was recorded in Banyumas Regency at 8.3%, followed by Blora Regency at 8.1% and Banjarnegara Regency at 7.7%. Meanwhile, the lowest percentage is found in Salatiga Regency with only 1.0%. Overall, the average percentage of BBLR in Central Java Province in 2023 is 5.3%. From this data, it can be seen that there are still some areas with BBLR numbers above the provincial average, so more attention is needed in efforts to handle and prevent BBLR cases.

Based on data from the Kudus Regional Health Office in 2024, of the total 1,178 babies who were targeted for health monitoring, there were various cases of complications that required special attention. The number of babies with asphyxia reached 171 cases, while infections were recorded as many as 43 cases, and congenital abnormalities were found in 23 babies. No cases of babies with danger signs of "no crying at birth" or TN (0 cases) were found. The most common cases were cases of babies with Low Birth Weight (BBLR), which was 609 cases, or equivalent to 51.67% of the total target. This data shows that BBLR is the most commonly found neonatal health problem, so it needs to be prioritized in its prevention and treatment efforts. In the Kudus Regency area itself, there are 19 health centers. Kaliwungu Health Center was recorded as the highest contributor of BBLR cases, which was 70 cases, while the lowest number was found at the Jati Health Center, which only recorded 12 cases (Kudus Regency Health Office, 2024). Based on survey data conducted at the Kaliwungu Health Center over the past 6 months, there were 38 cases of babies with BBLR. The results of interviews from 5 respondents were recorded that 3 respondents were caused by premature birth and 2 respondents were caused by anemia when the mother's gestational age entered the 3rd trimester.

Low Birth Weight (BBLR) is a condition of a baby born weighing less than 2,500 grams, usually measured in 1–24 hours after delivery. BBLR babies have a higher health risk, including up to 20 times greater chance of death than normal babies(Miraturrofi'ah et al., 2025). They are more susceptible to infection early in life and are at risk of cognitive impairment and developmental delays(Digner et al., 2024). Risk factors for BBLR include maternal aspects such as BBLR history, socioeconomic status,

Advances in Healthcare Research
Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

education, antenatal care, age, pregnancy distance, smoking habits, alcohol, stress, and maternal weight. Fetal factors such as congenital abnormalities, infections, genetics, and exposure to toxins, and placental factors such as insufficiency, vascular disorders, multiple pregnancies, placenta previa, or placental solution(Octarine et al., 2025). In addition, malnutrition, pregnancy complications, and congenital abnormalities also play a role. Although some BBLR babies can pursue growth, they are still at risk of stunting (Nurjanah et al., 2023).

Babies with BBLR are at risk of developing growth disorders because their physical conditions are still vulnerable, including limited energy reserves and immature organs. This can have an impact on slowing down the growth of weight length, and head circumference which is a sign of growth and development. Low birth weight can have an impact on child growth conditions such as stunting, the impact of BBLR in the long term interferes with the physical growth and mental development of children, thus BBLR can cause an increase in morbidity and mortality rates in children(Yuwanti et al., 2022). In addition to physical growth, BBLR increases the risk of non-communicable diseases in adulthood, such as type 2 diabetes, hypertension, and cardiovascular disorders. Baby boys with a history of BBLR are more likely to have abdominal obesity and high blood pressure, which can trigger heart attacks and strokes. BBLR is also associated with a decrease in IQ which affects long-term cognitive capacity. Thus, the impact is not only on physical growth, but also on the metabolic health and cognitive development of the child(Fauzia et al., 2024). Babies weigh less than 2500 grams and have both short- and long-term impacts on their growth. The impact of BBLR on growth and development in children includes: the short-term impact of BBLR can be in the form of asphyxia, polycythemia, hypothesis, and hypoglycemia. Long-term impacts include neurodevelopmental disorders and brains that interfere with learning abilities, as well as an increased risk of chronic diseases including infections and developmental problems in children (Student, 2025).

This study aims to analyze the relationship between anemia during pregnancy and the growth of children aged 1-6 months in the working area of the Kaliwungu Health Center, Kudus Regency. The study used bivariate analysis to find out whether or not there is a relationship between variables. The statistical test used was Fisher's Exact Test, which was chosen because the data characteristics did not meet the requirements of the Chi-Square test, so this test was considered more suitable for obtaining accurate results. During pregnancy, anemia is defined as a condition in which hemoglobin levels are less than 11 grams per deciliter in the first trimester and the third is 10.5 grams per deciliter throughout the second trimester. During pregnancy, anemia can cause adverse impacts for the mother and fetus (Ana Zumrotun Nisak2, 2021).

The remainder of this paper is organized as follows. Section 2 provides a literature review and hypothesis development. Section 3 presents the research method and design. Section 4 provides a discussion. Section 5 is Concluding Remarks and Recommendations.

2. Literature Review and Hypothesis Development

2.1 Low Birth Weight (BBLR)

Low Birth Weight (BBLR) is a baby born weighing less than 2,500 grams, regardless of gestational age. BBLR is categorized based on birth weight and is one of the main indicators in the health of newborns, because this condition is related to an increased risk of various health problems, such as respiratory disorders, difficulty maintaining body temperature, and growth retardation. According to the health

Advances in Healthcare Research
Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

literature, BBLR covers any baby born weighing under 2,500 grams, regardless of gestational age at birth (Suryani, 2020).

2.2 Growth of BBLR Babies

Growth is a biological process characterized by an increase in body size through changes in the number and dimensions of cells in all parts of the body. This process occurs comprehensively, so that it has an impact on increasing the size of organs and body tissues. In other words, growth reflects an increase in physical mass and size that occurs due to the increase in the number of cells and the enlargement of the cells that compose them(Kurniasih & Ramawati, 2024). Growth and development is influenced by several factors, including internal factors, including genetics, gender, and congenital conditions as well as external factors, including biological factors, environmental factors, and psychosocial factors. One of the growth and development factors that requires special attention is birth weight. Birth weight is weight measured by weighing in the first hour after birth into the world. Birth weight is related(Andreanetta et al., 2022).

2.3 The Relationship Between Maternal Characteristics and Baby Growth

Since the reproductive organs of women aged 20 to 35 years are still in the developmental stage and the psychological condition of men in this age group is also still in the developmental stage, pregnancy in this age group inevitably contributes to the lack of nutrients necessary for fetal growth, which can result in babies with a slower growth rate. However, in women over 35 years old, the female reproductive organs are still in the development stage and the psychological condition of pregnant women is also still in the developmental stage, so the growth of the fetus is not optimal. Research shows there is a relationship between maternal age and the incidence of BBLR (p-value = 0.030, OR (1,745) (Angga Arsesiana, 2021) The level of education of the mother is related to knowledge about health and pregnancy problems that affect her behavior and the care of her pregnancy. The level of education of the mother affects the incidence of BBLR, mothers with higher education are more likely to understand about health because mothers get extensive information about health compared to mothers with low education. The higher the mother's education, the more able she is to make decisions about health services during pregnancy so that this can prevent disturbances for the mother and her fetus. Most mothers with low education backgrounds greatly affect the risk of BBLR events. According to this study, low education levels also have a significant association with the incidence of BBLR, with 85% of respondents (p-value = 0.000)(Purba et al., 2025). Poor economic conditions due to unemployment will lead to poor food purchases. Working parents are unable to provide proper care to their children because they spend more time together. It may be among the risk factors for the growth and development of the baby. This shows that there is no correlation between maternal work and stunting, as shown by the variable Maternal Work with a value of P = 0.703 > α = 0.05(Health & Nutrition, 2021).

Mothers who give birth with high parity have a 1,703 times greater risk of giving birth to babies with low birth weight, which has an impact on the onset of various health problems for the mother and the baby born and can also lead to babies born with BBLR and even death. There is a significant relationship between gestational age and the incidence of low birth weight (BBLR) at Cilacap Hospital (gestational age) p-value = 0.000). This can be interpreted as gestational age with the preterm category has a 20,213 chance of experiencing BBLR events compared to parity with low risk (Apriani et al., 2021). The age of premature pregnancy in fetuses that are still in the womb has not been fully developed.

Advances in Healthcare Research
Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

Gestational age affects the incidence of BBLR (Babies with Low Birth Weight) because the development of the baby's organs is not perfect due to imperfect gestational age, so this also affects the baby's weight. Therefore, premature birth has a high risk of BBLR in babies. In the journal, it shows the distance between pregnancy (p-value = 0.173) with the incidence of BBLR. In conclusion, there is a relationship between maternal characteristics at gestational age and the incidence of BBLR, and there is no relationship between maternal age, education, disease history, parity, pregnancy distance and the incidence of BBLR at Yogyakarta City Hospital (Fatimah Izhara et al., 2025).

2.4 The Relationship Between Pregnancy Complications and Baby Growth

The nutritional condition of the mother both before and during pregnancy can affect her health. Mothers who are at risk have children who are stunted and babies with low birth weight. A history of chronic energy deprivation of the mother during pregnancy can hinder fetal development. In addition, compared to children born with a history of BBLR, children with a history of BBLR will experience faster growth. There was a meaningful relationship between the SEZ and the incidence of BBLR, the p value was obtained by 0.000 < 0.05(Maifita & Armalini, 2022). The level of anxiety of mothers giving birth with BBLR in the perinatology room of Asy Syifa Boyolali General Hospital is indicated by the level of anxiety of mothers giving birth with BBLR, which is listed in Table 2 above. With 18 respondents (60.0%), severe anxiety was experienced by the majority of respondents. Anxiety, which refers to situations that are not funny and inexplicable, is one of the responses of fear. Usually, anxiety will be explained through physical phenomena that, in reality, are less specific. The object is unclear, and in this condition, it is usually discussed subjectively (Puteri et al., 2022)

3. Research Method

This study uses a quantitative method with a retrospective cohort approach. The population in this study is all BBLR babies in the Kaliwungu Pukesmas work area with a total of 38 cases in 3 months, namely in October, November and December 2025. Sampling in this study uses the total sampling technique, namely all members of the population who have inclusion criteria are used as samples. Because the population is only 38 babies with a history of BBLR aged 1-6 months, all respondents were used as research samples. (Without using the sample determinant formula). Data collection techniques are methods or procedures used by researchers to collect data or relevant information for research purposes through documentation studies, questionnaires, or literature studies (Waruwu et al., 2025). In this study, it is carried out in stages to ensure that the collected data is processed and presented correctly so that the results can be accepted. Editing, coding, data entry, tabulation, and statistical analysis. The data analysis in this study was carried out through two stages, namely univariate analysis and bivariate analysis.

Advances in Healthcare Research
Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

4. Results and Discussion

4.1 Analysis Results

4.1.1 Respondent characteristics

Univariate analysis was carried out to determine the frequency and percentage distribution of each study variable, including maternal characteristics, pregnancy complications, and baby growth.

Table 1. Frequency Distribution of Respondent Characteristics by Respondent Age

No.	Age	Frequency	Percentage
1.	20-35	33	86,8
2	>35	5	23,7
	Total	38	100,0

Source: *Primary data, November 2025*

Based on Table 1, most of the respondents were aged 20-35 years, namely 33 people (86.8%) and 5 respondents aged >35 years (23.7%)

Table 2. Frequency Distribution of Respondent Characteristics Based on Mother's Education

No.	Education	Frequency	Percentage
1.	Intermediate	29	76,3
2.	Height	9	23,7
	Total	38	100,0

Source: *Primary data, November 2025*

Most of the respondents had a secondary education level of 29 people (76.3%) and higher education amounted to 9 people (23.7%)

Table 3. Frequency Distribution of Respondent Characteristics Based on Maternal Occupation

No.	Jobs	Frequency	Percentage
1.	IRT	12	36,8
2.	Labor	20	52,6
3.	Employees	4	10,5
	Total	38	100,0

Source: *Primary data, November 2025*

The majority of respondents worked as laborers, namely 20 people (52.6%), 12 (36.8) people became IRTs and 4 (10.5) people worked as employees.

Table 4. Frequency of Respondent Characteristics Based on Maternal Parity

No.	Parity	Frequency	Percentage
1.	Primipara	15	39,5
2.	Multipara	23	60,5
	Total	38	100,0

Source: *Primary data, November 2025*

Most of the respondents had a multipara status of 23 people (60.5%) and primipara as many as 15 people (39.5).

Advances in Healthcare Research
Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

Table 5. Frequency Distribution Of Respondent Characteristics by Gestational Age

No.	Gestational Age	Frequency	Percentage
1.	Premature	13	34,2
2.	Terrible	25	65,8
	Total	38	100,0

Source: *Primary data, November 2025*

The majority of mothers gave birth at the age of gestation, namely 25 people (65.8%) and 13 (34.2) people of premature gestational age.

Table 6. Distribution of Respondent Complication Frequency by Anemia

No.	Anemia	Frequency	Percentage
1.	There	10	26,3
2.	None	28	73,7
	Total	38	100,0

Source: *Primary data, November 2025*

Respondents who had anemia were 10 people out of 38 respondents, namely (26.3%), the rest did not experience anemia, namely 28 people (73.7%).

Table 7. Distribution of Respondent Complication Frequency Based on SEZs

No.	KEK	Frequency	Percentage
1.	There	3	7,9
2.	None	35	92,1
	Total	38	100,0

Source: *Primary data, November 2025*

Only 3 (7.9%) of the respondents experienced SEZ and 35 (92.1%) people did not experience SEZ

Table 8. Distribution of Respondent Complication Frequency by Preeclampsia

No.	Preeclampsia	Frequency	Percentage
1.	There	6	15,8
2.	None	32	84,2
	Total	38	100,0

Source: *Primary data, November 2025*

Of the respondents who experienced preeclampsia, 6 (15.8%) did not, namely 32 people (84.2).

Table 9. Distribution of Respondents' Complication Frequency Based on Anxiety

No.	Anxiety	Frequency	Percentage
1.	There	3	7,9
2.	None	35	92,1
	Total	38	100,0

Source: *Primary data, November 2025*

Of the 38 respondents who experienced anxiety during pregnancy, 3 people (7.9%) and respondents who did not experience anxiety amounted to 35 people (92.1%)

Advances in Healthcare Research
Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

Table 10. BBLR Frequency Distribution by Growth (n=38)

No.	Growth	Frequency	Percentage
1.	Normal	29	76,3
2.	Malnutrition	9	23,7
	Total	38	100,0

Source: *Primary data, November 2025*

Most of the babies had normal growth, namely as many as 29 babies (76.3%) and those who experienced malnutrition amounted to 9 babies (23.7%)

4.1.2 Bivariate Analysis

4.1.2.1 The Relationship of Maternal Characteristics to Growth

Table 11. The Relationship of Maternal Characteristics to Growth

Variable	Categories	Normal	%	Malnutrition n(%)	%	Total n(%)	%	p-value
Mother's Age	20-35 years	24	82,8	9	100,0	33	86,8	0,312
	>35 th	5	17,2	0	0,0	5	13,2	
Education	Intermediate	22	75,9	7	77,8	29	76,3	1,0
	Height	7	24,1	2	22,2	9	23,7	
Jobs	IRT	12	41,4	2	22,2	14	36,8	0,242
	Labor	13	44,8	7	77,8	20	52,6	
	Employees	4		0		4		
Parity	Primipara	10	34,5	5	56,6	15	39,5	0,436
	Multipara	19	65,5	4	44,4	23	60,5	
Gestational Age	Premature	12	41,4	1	11,1	13	34,2	0,126
	Stuttgart	17	58,6	8	88,9	25	65,8	

Source: *Primary data, November 2025*

Based on the results of the bivariate analysis in Table 11 regarding the relationship between maternal characteristics and infant growth, it is known that the majority of mothers are at the age of 20–35 years, have secondary education, work as laborers, have multiparapara, and give birth at the age of gestation. In all of these variables, most babies showed normal growth compared to malnourished babies. The results of the statistical test showed that maternal age (p-value = 0.312), education (p-value = 1.000), employment (p-value = 0.242), parity (p-value = 0.436), and gestational age (p-value = 0.126). Based on the results of bivariate analysis using the Fisher's Exact Test, all variables showed a p>0.05 value so there was no significant relationship with the baby's growth. However, the gestational age variable had the smallest p-value (p = 0.126) compared to other variables, so it can be said to be the most dominant factor in this study.

4.1.2.1 The Relationship of Complications with Growth

Based on the results of the bivariate analysis in Table 12 regarding the relationship between pregnancy complications and baby growth, it is known that most mothers do not experience anemia, KEK, preeclampsia, or anxiety. In the anemia variable, babies with normal growth were more found in mothers who did not experience anemia than mothers who experienced anemia, with the results of statistical tests showing a p-value = 1,000 (p > 0.05). In the SEZ variable, the majority of mothers did not

Advances in Healthcare Research
Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

experience SEZ and most of the babies had normal growth, with a p-value = 1,000 (p > 0.05). Furthermore, in the preeclampsia variable, most mothers did not experience preeclampsia and the babies showed normal growth, with the results of the statistical test obtained p-value = 0.613 (p > 0.05). In the anxiety variable, the majority of mothers did not experience anxiety and all babies in the group of mothers without anxiety had normal growth, with a p-value = 1,000 (p > 0.05). Based on these results, it can be concluded that there is no statistically significant relationship between pregnancy complications (anemia, KEK, preeclampsia, and anxiety) and infant growth.

Table 12. The Relationship of Maternal Characteristics to Growth

Variable	Categorical	Normal	%	Malnutrition	%	Total	%	p-value
Anemia	None	21	72,4	7	77,8	28	73,7	1,0
	There	8	27,6	2	22,2	10	26,3	
KEK	None	27	93,1	8	88,9	35	92,1	1,0
	There	2	6,9	1	11,1	3	7,9	
Preeclampsia	None	25	86,2	7	77,8	32	84,2	0,613
	There	4	13,8	2	22,2	6	15,8	
Anxiety	None	26	89,7	9	100	35	92,1	1,0
	There	3	10,3	0	0	3	7,9	

Source: *Primary data, November 2025*

4.2 Discussion

4.2.1 Respondent Characteristics

This study was conducted to analyze the determinants of factors that affect Low Birth Weight (BBLR) on the growth of babies aged 1-6 months at the Kaliwungu Kudus Health Center. The characteristics of the maternal respondents studied included maternal age, education level, occupation, parity, and gestational age during childbirth. The results of univariate analysis showed that most mothers were at a safe reproductive age, which was 20–35 years. This age is biologically the most ideal age for pregnancy because the reproductive organs have matured and the risk of pregnancy complications is relatively lower. However, it is still found that mothers with the age of <20 years and >35 years are known to have a higher risk of the occurrence of BBLR and baby growth disorders. These findings are consistent with the results of other studies showing that pregnant women of risk age (<20 years or >35 years) are more likely to give birth to babies with low birth weight compared to mothers of healthy reproductive age; for example, Liznindya (2023) reported that these at-risk ages significantly increased the chance of BBLR in studies in Bandung Regency (p = 0.002) (Liznindya et al., 2023) and according to other researchers in addition, several other analytical studies also confirm the relationship between extreme maternal age categories and the incidence of BBLR, where immature reproductive organs at a young age and decreased organ function in old age are cited as biological factors that contribute to fetal growth disorders, including the risk of BBLR(Apriani et al., 2021).

Based on education level, most mothers have a secondary education. Education plays an important role in determining the mother's ability to receive health information, understand the importance of nutrition during pregnancy, and adherence to antenatal checkups. This is in line with findings in studies showing that maternal education correlates with improved maternal skills in understanding important health information during pregnancy, including diet and access to proper

Advances in Healthcare Research
Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

health services, which can ultimately affect pregnancy outcomes and overall newborn status (Nurhidayah, 2024). Some studies have also found that mothers with higher levels of education tend to have better access to information and stronger antenatal screening adherence, which contributes to efforts to prevent pregnancy complications and the risk of low birth weight (BBLR). On the other hand, mothers with lower education have the potential to experience limitations in accessing and understanding health information, thus negatively impacting nutritional fulfillment during pregnancy and can contribute to suboptimal birth weight outcomes(Maryana et al., 2024)

In terms of employment, the majority of mothers do not work or work in the informal sector. This condition can have an impact on the economic status of the family, which indirectly affects the mother's ability to meet nutritional needs during pregnancy and breastfeeding. Some studies have shown that maternal employment status is related to infant nutrition and health outcomes, where informal work with low wages and economic uncertainty can limit maternal access to nutritious food and adequate health services, potentially impacting suboptimal pregnancy outcomes such as low birth weight and lack of adequate nutritional intake during pregnancy. To illustrate, a systematic review revealed that the status of working mothers, especially in unskilled or low-wage jobs, may be related to suboptimal child nutrition due to limited time for child care and limited household resources for good nutritional intake(Waghode et al., 2025). Maternal parity in this study was mostly in the multipara category, which theoretically had a lower risk than primipara and grand multipara, although recurrent pregnancies still needed special monitoring. Other evidence also states that socio-economic factors, including employment and family income, are important determinants of pregnant women's nutritional status which in turn affects the long-term sustenance of the mother and baby(Tareke et al., 2024).

In this study, the parity of the majority of mothers was in the multipara category, which theoretically tended to have a lower risk of pregnancy complications than primipara and grand multipara mothers. These findings are consistent with evidence from the recent literature showing that parity is an important factor influencing pregnancy outcomes and BBLR incidence. For example, a large cohort study in 2025 found that the risk of overall maternal complications was higher in primipara mothers than in multipara, although after adjustment, the differences for some neonatal outcomes such as BBLR were not significant between the two groups, suggesting the complexity of the relationship between previous labor experiences and birth outcomes(Liu et al., 2026). In addition, studies in the local context also identified a significant association between maternal parity and BBLR incidence, where a higher proportion of BBLR was found in primipara and grand multipara mothers compared to multipara. In the study, mothers with parity of 1 (primipara) and ≥5 (grandemultipara) showed a greater proportion of BBLR (32.7% and 22.6%) than multipara (5.0%), as well as a statistically significant analysis ($p < 0.05$), which strengthens the evidence that maternal reproductive experience has an effect on infant birth weight outcomes(Apriani et al., 2021).

Based on the results of univariate analysis of gestational age, out of a total of 38 respondents, most of the mothers gave birth at term gestation, namely 25 people (65.8%), while mothers with preterm gestational gestation age were 13 people (34.2%). The percentage was obtained from the results of calculating the number of each pregnancy age category divided by the total respondents, then multiplied by 100%. Mathematically, the percentage of preterm pregnancy age is calculated from (13/38) × 100% = 34.2%, while the gestational age is calculated from (25/38) × 100% = 65.8%. In addition, gestational age is an important determinant factor in pregnancy outcomes, including the incidence of low birth weight (BBLR). The results of local studies showed a significant relationship between gestational age and the incidence of BBLR, where mothers who gave birth at <37 weeks

Advances in Healthcare Research
Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

gestation (premature) had a higher chance of giving birth to a low-weight baby compared to mothers who gave birth at a term of ≥37 weeks. An analytical study in the working area of the 7 Ulu Health Center, Palembang, found that gestational age is significantly related to the incidence of BBLR (p = 0.000), so this factor needs special attention in antenatal services(L. Sari et al., 2022). These results are similar to other findings (Silaban et al., 2024) which suggests that gestational age is significantly correlated with the incidence of BBLR, in which mothers of preterm gestational age have a much higher risk compared to normal gestational age. These studies confirm that preterm labor is seen as one of the main causes of BBLR, as shorter intrauterine growth times do not allow the fetus to reach optimal birth weight. This condition is consistently reported in the maternal and neonatal health literature as a significant risk factor that needs to be mitigated through proper pregnancy monitoring, maternal nutrition education, and early detection of risk factors for prematurity during ANC (antenatal care).

After conducting direct data observations in the field, it was found that the incidence of Low Birth Weight (BBLR) in babies is known to be related to the nutritional condition of the mother during pregnancy. Mothers with suboptimal nutritional intake tend to have insufficient nutritional reserves to support fetal growth to the maximum, so they are at risk of giving birth to babies with low birth weight. This condition shows that the fulfillment of nutrition for pregnant women plays an important role in the fetal growth process and needs special attention as an effort to prevent BBLR.

4.2.2 Growth of Babies with a History of BBLR

This study aims to analyze the relationship between the growth of babies with a history of Low Birth Weight (BBLR) and the growth of babies aged 1–6 months in the working area of the Kaliwungu Health Center, Kudus Regency. The study used bivariate analysis to find out whether or not there is a relationship between variables. The statistical test used was Fisher's Exact Test, which was chosen because the data characteristics did not meet the requirements of the Chi-Square test, so this test was considered more suitable for obtaining accurate results. Based on research conducted by researchers, many babies were found with normal growth according to their age.

Low Birth Weight (BBLR) is clinically seen as one of the early risk factors for imoptimal growth in infancy, but the association does not always result in a statistically significant association in the early life period. A cross-sectional study examining the relationship between BBLR history and growth of infants aged 0–12 months showed a p = 0.1094 value, indicating that there was no significant correlation between BBLR history and infant growth in that period, although there was a tendency to risk malnutrition in BBLR infants in the long term(Syahida et al., 2025). In addition, studies in several populations show that BBLR is closely related to the incidence of stunting in toddlers in general, but the direct relationship to anthropometric growth of very early infants is often influenced by other factors such as nutritional intake and health care support(Kalsum & Susanti, 2025)

Based on the results of another study, children with a history of low birth weight mostly had normal nutritional status (BB/U) with a p-value (0.111≥0.05), meaning that there was no significant relationship between a history of low birth weight and nutritional status (BB/U) in children aged 36–72 months. Children with a history of BBLR have a slight reduction in the risk of malnutrition by 0.946. However, these findings are in contrast to other evidence showing that BBLR can have a significant impact on children's nutritional status and development, especially on other indicators such as stunting, underweight, and healthy growth continuity. Another study focusing on the relationship between BBLR and the nutritional status of children aged 6–36 months in Indonesia showed that BBLR was significantly

Advances in Healthcare Research
Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

correlated with poor nutritional status, where children born with low birth weight were more likely to experience conditions such as underweight and stunting p-value (0.016<0.05). The study confirms that BBLR is an important risk factor in determining the nutritional status of children in childhood, which is influenced by early nutritional factors, parenting, and overall family well-being (Damayanti & Deviana, 2025). Differences in results can be caused by differences in the age of child samples, methods of measuring nutritional status, and confounding variables such as food intake and chronic infectious diseases that also affect child growth. Therefore, although in the context of research researchers BBLR history did not show a significant association with BB/U nutritional status in children aged 36–72 months, other researchers still emphasized the importance of BBLR as a factor that can affect children's nutritional status and growth, so that follow-up monitoring and nutritional interventions in children born with BBLR are still needed(Damayanti, 2025). On the other hand, several studies that focused on longer-term outcomes such as stunting incidence in toddlers with a history of BBLR found a significant association, suggesting that at older ages, BBLR may still be a risk factor for anthropometric growth disorders ($p < 0.05$). For example, a case study in a specific community reported an association of BBLR with stunting incidence in toddlers ($p = 0.033$), suggesting that the effects of BBLR on growth may appear in the age period after 6 months and are influenced by environmental factors as well as long-term nutritional fulfillment(Health et al., 2024)

4.2.3 The Relationship of Maternal Age to Growth

This study was conducted to examine the relationship between maternal age and the growth of babies aged 1–6 months in the working area of the Kaliwungu Health Center, Kudus Regency. The analysis used is a bivariate analysis to assess whether there is a relationship between the two variables. Statistical testing was carried out using Fisher's Exact Test, because the distribution of the data obtained did not meet the conditions for using the Chi-Square test, so this method was chosen to produce a more precise and reliable analysis.

Statistical results showed that there was no significant correlation between BBLR growth and maternal age. This is shown by a p value greater than 0.05, which is a p value of 0.312. However, descriptively, children born to parents of at-risk age (under 20 years and over 35 years old) tend to have a higher proportion of growth. It is likely that this is due to the extensive use of the mother in healthy reproduction, resulting in a smaller variation in risk. In addition, factors such as breast milk, growth monitoring, and health interventions after the birth of the child can help promote the growth of the BBLR child. Thus, although descriptively there is a difference in the proportion of BBLR child growth based on the mother's age, statistical analysis and scientific literature evidence show that the influence of maternal age on the growth status of children's BB/U is usually insignificant when other factors are taken into account, so it is necessary to focus on nutritional interventions, growth monitoring, and comprehensive child health services to support the development of BBLR children.

4.2.4 The Relationship of Maternal Education to Growth

This study aims to analyze the relationship between maternal education and the growth of children aged 1–6 months in the working area of the Kaliwungu Health Center, Kudus Regency. The study used bivariate analysis to find out whether or not there is a relationship between variables. The statistical test used was Fisher's Exact Test, which was chosen because the data characteristics did not meet the

Advances in Healthcare Research
Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

requirements of the Chi-Square test, so this test was considered more suitable for obtaining accurate results.

Maternal education theoretically plays an important role in shaping the mother's ability to understand health information, implement appropriate breastfeeding practices, and demonstrate commitment to the utilization of maternal and child health services. Mothers with higher levels of education are generally assumed to have better knowledge and awareness related to nutritional fulfillment, infant care, and regular growth monitoring. However, based on the results of the Fisher Exact test in this study, no significant relationship was found between the mother's education level and the baby's growth, which was indicated by the p = 1,000 (> 0.05). These results indicate that both mothers with secondary and higher education have relatively similar proportions of infant growth, so differences in formal education levels do not have a meaningful effect on infant growth. The findings show that formal education is not the only factor that determines the success of children's growth, because the baby's growth is also greatly influenced by other factors such as breastfeeding practices, parenting, family support, access to health services, and health education obtained by mothers through health workers and posyandu activities. In addition, the existence of an equitable maternal and child health program in the community can help equalize the level of knowledge and behavior of maternal health, regardless of her formal educational background. Thus, the results of this study confirm that infant growth is a multidimensional process and is influenced by the interaction of various factors, so health interventions need to focus not only on improving formal education of mothers, but also on strengthening sustainable health education and family assistance in childcare and nutrition practices.

4.2.5 The Relationship of Mother's Work to Growth

This study was conducted to examine the relationship between work and the growth of babies aged 1–6 months in the working area of the Kaliwungu Health Center, Kudus Regency. The analysis used is a bivariate analysis to assess whether there is a relationship between the two variables. Statistical testing was carried out using Fisher's Exact Test, because the distribution of the data obtained did not meet the conditions for using the Chi-Square test, so this method was chosen to produce a more precise and reliable analysis.

The results of the analysis showed that there was no significant relationship between maternal work and infant growth, with a p value of 0.242 (p > 0.05). These findings indicate that the mother's type of work is not a factor that directly affects the baby's growth. Although mothers who worked as laborers tended to have a heavier physical workload and limited rest time, these conditions have not been shown to have a significant effect on infant growth in this study. This may be influenced by other factors such as parenting, family support, and the fulfillment of the baby's nutritional needs that are maintained. However, the insignificance of the results of this study suggests that the work factor can be compensated with family support and regular monitoring of the baby's health. (Waghode et al., 2025)

4.2.6 The Relationship of Parity with Growth

This study aims to examine the relationship between parity history and infant growth in the age range of 1-6 months in the working area of the Kaliwungu Health Center, Kudus Regency. The approach used is bivariate analysis to find out whether there is a relationship between the variables studied. Statistical analysis was conducted with the Fisher's Exact Test, which was chosen because the data conditions did

Advances in Healthcare Research
Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

not meet the requirements of the Chi-Square test, so this method was judged to be more appropriate to describe the actual relationship.

With a p-value of 0.436, the results of the statistical test showed that there was no significant relationship between parity and infant growth. When comparing primipara mothers (55.6%) with multipara (44.4%), babies with relatively normal growth were more commonly found., These findings are consistent with empirical evidence that also reports that parity is not necessarily significantly related to growth outcomes or birth weight of infants, especially when nutritional factors, exclusive breastfeeding, and health care support are met. For example, in a cross-sectional study evaluating the relationship of parity with the incidence of low birth weight (BBLR), the results of the analysis showed p = 0.533, so there was no significant association between parity and the incidence of BBLR, indicating that parity itself is not the single determinant factor of newborn growth (*p > 0.05)(Muzdalia et al., 2022).

4.2.7 The Relationship of Gestational Age to Growth

This study was conducted to examine the relationship between gestational age and the growth of babies aged 1–6 months in the working area of the Kaliwungu Health Center, Kudus Regency. The analysis used is a bivariate analysis to assess whether there is a relationship between the two variables. Statistical testing was carried out using Fisher's Exact Test, because the distribution of the data obtained did not meet the conditions for using the Chi-Square test, so this method was chosen to produce a more precise and reliable analysis.

Premature delivery (<37 weeks) is one of the causes of BBLR. Premature or full-term infants have significant differences in the incidence of BBLR. Babies born at full moon have physical eNo., while premature babies experience development that is not optimal and physically immature(Khoirunnisa et al, 2024). Therefore, gestational age is not the sole factor that determines the growth of a baby during the first six years of life. In this study, it was found that there was no significant relationship between gestational age and infant growth, with a value of p = 0.126 (Fisher Exact Test). Descriptively, babies born preterm experienced more abnormal growth (88.9%) than premature babies (11.1%). Findings in the field show that gestational age is the most common factor found in respondents in this study compared to other factors. Most babies are born with a suboptimal gestational age, so this condition has the potential to affect the growth process in the early stages of life. Although the results of statistical analysis have not shown a significant relationship between gestational age and the growth of babies aged 1–6 months, the suboptimal frequency of gestational age events in respondents suggests that this factor still has a clinically important role. Therefore, gestational age needs to receive attention in efforts to monitor and prevent baby growth disorders.

4.2.8 The Relationship of Anemia to Growth

This study aims to analyze the relationship between anemia during pregnancy and the growth of children aged 1-6 months in the working area of the Kaliwungu Health Center, Kudus Regency. The study used bivariate analysis to find out whether or not there is a relationship between variables. The statistical test used was Fisher's Exact Test, which was chosen because the data characteristics did not meet the requirements of the Chi-Square test, so this test was considered more suitable for obtaining accurate results. During pregnancy, anemia is defined as a condition in which hemoglobin levels are less than 11 grams per deciliter in the first trimester and the third is 10.5 grams per deciliter throughout the

Advances in Healthcare Research
Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

second trimester. During pregnancy, anemia can cause adverse effects for both mother and fetus (Ana Zumrotun Nisak2, 2021).

The results of the statistical test showed that there was no significant association between maternal anemia and infant growth, with a value of p = 1,000. Babies with abnormal growth mostly came from mothers who did not have anemia (77.8%). Bivariate results from other researchers showed that a history of anemia during pregnancy is a risk factor for stunting but is statistically insignificant (p=0.13, OR=1.5, 95%CI=0.85-2.73) and results were obtained that there is no relationship between the history of KEK and maternal anemia during pregnancy with the incidence of stunting in Sedayu Bantul District, Yogyakarta. Children who suffer from stunting mostly come from families whose mothers are less tall, their families are food insecure and are born with a history of BBLR.(Warsini et al., 2020)

4.2.9 The Relationship between SEZs and Growth

This study was carried out to evaluate the relationship with the history of the mother's SEZ during pregnancy and the growth of babies aged 1–6 months in the working area of the Kaliwungu Health Center, Kudus Regency. The analysis applied is a bivariate analysis with the aim of identifying whether or not there is a relationship between the variables being studied. The statistical test used, Fisher's Exact Test, was chosen because the research data did not meet the assumptions of the Chi-Square test, so this test was considered more appropriate to obtain valid results

One of the problems of malnutrition in pregnant women will cause KEK (Chronic Energy Deficiency). Babies born to mothers with SEZ conditions will have a low birth weight (BBLR) of less than 2.5 kg. The factors that affect the growth of fetal weight are two namely genetic factors and environmental factors, in the environmental factors themselves there are several other factors that affect the growth of fetal weight, namely nutritional status, mechanical influences, the influence of drugs, endocrine, infections and stress or anxiety. In the nutritional status factor of pregnant women, if a pregnant woman experiences malnutrition, there can be several disturbances in the baby she will be born, including the risk of KEK, low birth babies, premature abnormalities, birth with various difficulties and stillbirth (Hidayah & N.Azizah, 2015)

Statistical results showed that there was no statistically significant relationship between SEZ and infant growth, with p = 1,000. Nevertheless, babies from mothers with SEZs still have relatively normal growth proportions that need to be considered. KEK is an indicator of the nutritional status of the mother that can affect fetal growth. However, nutritional interventions during pregnancy and monitoring the baby's growth can help improve the situation.

4.2.10 The Relationship of Preeclaation with Growth

This study aims to analyze the relationship between maternal preeclampsia during pregnancy and the growth of children aged 1–6 months in the working area of the Kaliwungu Health Center, Kudus Regency. The study used bivariate analysis to find out whether or not there is a relationship between variables. The statistical test used was Fisher's Exact Test, which was chosen because the data characteristics did not meet the requirements of the Chi-Square test, so this test was considered more suitable for obtaining accurate results. The results showed that there was no significant relationship between preeclampsia and infant growth, with a p value = 0.613. More babies with abnormal growth came from mothers without preeclampsia (77.8%).

Advances in Healthcare Research
Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

These findings are in line with a study that analyzed the relationship between preeclampsia and infant outcomes and showed that preeclampsia was not significantly associated with infant growth after birth, with a value of p = 0.482 (p > 0.05). The study explains that although preeclampsia is at risk of causing intrauterine growth disorders, its impact on postnatal growth can be reduced if the baby receives adequate care and nutritional intake after birth(Aldama et al., 2025) In addition, another cohort study evaluating the impact of preeclampsia on child growth and development reported that there was no significant association between maternal preeclampsia history and child growth status in infancy, with a p = 0.391. The study emphasizes that postnatal environmental factors, such as breastfeeding patterns, nutritional status, and routine health monitoring, have a more dominant role than pregnancy complications alone(Syahda et al., 2024)

Based on the results of the article that has been reviewed previously, it can be concluded that preeclampsia as a type of hypertensive disorder in pregnancy has a significant impact on several aspects of child development. The aforementioned impacts can be observed from early in pregnancy and are characterized by physical growth, such as low birth weight, short body length, and potential delayed growth. However, more importantly, these disorders are also closely related to neurocognitive development and child development both in the short and long term.(Hamsah et al., 2025).

4.2.11 The Relationship of Anxiety to Growth

This study was carried out to evaluate the relationship between the history of Low Birth Weight Infants (BBLR) and the growth of babies aged 1–6 months in the working area of the Kaliwungu Health Center, Kudus Regency. The analysis applied is a bivariate analysis with the aim of identifying whether or not there is a relationship between the variables being studied. The statistical test used, Fisher's Exact Test, was chosen because the research data did not meet the assumptions of the Chi-Square test, so this test was considered more appropriate to obtain valid results.

Anxiety is an obscure and pervasive worry associated with feelings of insecurity and powerlessness. Anxiety is the formation of various mixed emotional processes that occur when a person experiences various pressures or tensions. Fear is different from anxiety, which is an intellectual assessment of danger. Anxiety is an emotional response to that judgment. Causes of Anxiety Feelings of anxiety can arise from two causes, namely the anxiety occurs and is realized, such as fear, surprise, helplessness, guilt(Wigati et al., 2023).

The results of the analysis showed that there was no significant association between maternal anxiety and infant growth, with p = 1,000. Every baby with relatively normal growth comes from a mother who does not experience anxiety. This result can be influenced by the number of mothers who have relatively low anxiety (7.9%). Additionally, family bonds and health care can help reduce the negative psychological impact of childbirth. Another researcher also said there was no significant relationship between maternal anxiety and 1-month infant development, namely the Asymp.Sig. (2-sided) obtained 0.245 (P>0.05) (Nurbaya, 2020).

Advances in Healthcare Research
Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

5. Concluding Remarks and Recommendation

This study shows that the growth of infants aged 1–6 months with a history of low birth weight in the service area of the Kaliwungu Kudus Community Health Center is influenced by various maternal and postnatal factors; however, the results of the bivariate analysis using Fisher's Exact Test indicate that most of the variables studied do not have a statistically significant association with infant growth. Variables such as maternal age, education, occupation, parity, gestational age, anemia, malnutrition, preeclampsia, and maternal anxiety yielded p-values > 0.05. Nevertheless, descriptively, certain factors—such as preterm gestational age, maternal nutritional status during pregnancy, and a history of pregnancy complications—remain clinically relevant as they can increase the risk of LBW and infant growth disorders during the early stages of life. These findings confirm that infant growth is not determined by a single factor but rather results from the interaction between pregnancy conditions, nutritional adequacy, breastfeeding practices, family support, and access to healthcare services.

Theoretically, this study reinforces the understanding that LBW and maternal factors need to be examined within a multidimensional framework, as statistically insignificant relationships do not always negate the clinical significance of a risk factor. From a management perspective, the study's results recommend strengthening pregnancy monitoring through antenatal care (ANC), nutrition education for pregnant women, early detection of preterm birth risks, and regular infant growth monitoring at community health posts and public health centers. Healthcare providers should also provide support to families of infants with a history of LBW to ensure optimal breastfeeding practices, nutritional intake, and infant care. Future research is recommended to use a larger sample size, a longitudinal design, and to consider confounding variables such as breastfeeding patterns, infections, socioeconomic status, and family caregiving practices.

Statement of Use of Generative AI

During the preparation of this work, the author used ChatGPT to assist in improving clarity and readability of the text. The author reviewed and edited the output and takes full responsibility for the content of the publication.

References

Aldama, A., Study, P., Doctor, P., Medicine, F., & Abdurrab, U. (2025). The relationship between pre-eclampsia, parity, gestational age and low birth weight babies at Arifin Achmad Hospital, Riau Province in 2019-2021. 8(2), 1–9.

Andreanetta, P. T., Santosa, Q., Indriani, V., Arifah, K., & Fatchurohmah, W. (2022). The relationship between birth weight and nutritional status and development of children aged 6 – 60 months. E-Journal of Udayana Medicine, 11(9), 34. https://doi.org/10.24843/mu.2022.v11.i9.p07

Andri Nusi, Nirwan Junus, D. A. lily. (2022). Journal of Scientific Research. Journal of Scientific Research, 1(01), 15–18.

Angga Arsesiana. (2021). Analysis of the Relationship between Maternal Age and Pregnancy Distance with the Incidence of Low Birth Weight Infants (Bblr) at Panembahan Senopati Hospital Bantul. Jurnal_Kebidanan, 11(1), 592–597. https://doi.org/10.33486/jurnal_kebidanan.v11i1.136

Apriani, E., Subandi, A., & Khusni, A. (2021). The Relationship between Pregnant Women's Age, Parity and Gestational Age with the Incidence of BBLR at Cilacap Hospital. TeNS: Trends of Nursing Sciences , 4(1), 45–52.

Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

Arsita Harnawati, R., & Adevia Maulidya Chikmah. (2024). Management of High-calorie eating to increase lila (upper arm circumference) in pregnant women (chronic energy deficiency). Indonesian Journal of Public Health (JKMI), 1(3), 1–5. https://doi.org/10.62017/jkmi.v1i3.1008

Astuti, M. & (2025). The relationship between husband and family support and the regularity of pregnant women in anc. Journal of Social and Technology, 5(3), 396–405.

Bahrum, S. W. (2024). Analysis of Prevention, Control and Impact of BBLR in Indonesia- Study Literature. Journal of Health News, 17(2), 87–95. https://doi.org/10.58294/jbk.v17i2.215

Bblr, R., Desa, D. I., Ciparay, S., & Bandung, K. A. B. (2023). THE RELATIONSHIP BETWEEN THE AGE OF PREGNANT WOMEN AND THE INCIDENCE OF LOW BIRTH WEIGHT BABIES (BBLR) IN SERANGMEKAR VILLAGE, CIPARAY REGENCY, BANDUNG IN 2021. 3(1), 1–5.

Born, B., Bblr, R., & Asphyxia, D. (2025). Relationship Between Preeclampsia Incidents With Low Birth Weight (LBW) Incidents And Neonatorum Asphixia At Abby Maternity Hospital , Lhokseumawe City. 8(September), 635–647.

Central Java Health Office. (2023). Mid-2023 Central Java. 267.

Damayanti, D. S., & Deviana, M. (2025). Identification of the growth and development of children with a history of low birth weight (BBLR). 19(8), 2254–2261.

Di, B., Kerja, W., Padang, P., Yeni, H., & Rahman, S. (2025). DETERMINANTS OF LOW BIRTH WEIGHT INFANT Determinants of Low Birth Weight (LBW) Deliveries in the Work Area of Padang Luas Community Health Center in 2023. 11(1), 415–424.

Fatimah Izhara, Prasetya Lestari, Lia Dian Ayuningrum, & Fatimah. (2025). The Relationship between Maternal Characteristics and the Incidence of Bblr at Yogyakarta City Hospital. Scientific Journal of Midwifery, 11(1), 39–53. https://doi.org/10.33023/jikeb.v11i1.2521

Fauzia, V. N., Sutrisminah, E., & Meiranny, A. (2024). Relationship Between Anemia in Pregnant Women and the Incidence of LBW: Literature Review. Indonesian Health Promotion Publication Media, 7(4), 795–804. https://doi.org/10.56338/mppki.v7i4.4738

Gemilastari, R., Zeffira, L., Malik, R., & Tri Septiana, V. (2024). Characteristics of Babies with Low Birth Weight (BBLR). Scientific Journal, 3(1), 16–26. https://doi.org/10.56260/sciena.v3i1.125

Hamsah, M., Baderu, H., & Z, A. A. P. N. (2025). The relationship between child growth and development with the birth history of preeclampsia mothers. 15(01).

Harum, F., & Perdana, A. A. (2025). The BBLR incident in Indonesia. Journal of the World of Health, 14(1), 34–40.

Health, D., Saputra, I., Usman, S., & Maulana, T. (2024). THE RELATIONSHIP OF LOW BIRTH WEIGHT WITH STUNTING INCIDENTS IN ACEH IN 2022 of Public Health Study Program , Faculty of Medicine , Syiah Kuala University , Indonesia. 10(06), 39–49.

Health, J., & Pelamonia, D. (2021). The Relationship between Low Birth Weight Babies (BBLR) and Maternal Work on the Incidence of Stunting at the Bara-Baraya Makassar Health Center in 2021. 5(1), 18–23.

Hidayah, N., & Khusna, N. (2015). Anxiety, Maternal Nutritional Status on Estimated Fetal Weight in Pregnant Women in the Third Trimester at BPM Mrs. Yayuk Kalbariyanto Kudus. Jikk, 6(1), 1–10.

Ii, B. A. B., Theory, A. L., Baby, B., & Born, B. (2022). health journal.

Important, A., Islami, I., & Astuti, D. (2024). The incidence of low birth weight based on pregnancy history. Journal of Nursing and Midwifery Sciences, 15(1), 102–109. https://doi.org/10.26751/jikk.v15i1.2185

Jannah, M., Kabuhung, E. I., & Hidayah, N. (2023). The Relationship between SEZ and Exclusive Breastfeeding History with Stunting Incidence at the Halong Inpatient Health Center UPTD. 1(6), 300–304.

Journal, L. N. (2021). The Relationship between Maternal Employment Status and the Development of Toddler Children in the Talise Community Health Center Work Area Ririn Farhana, Lenny, Fadli Dg . Patompo, Baiq Emy Nurmalisa Poltekkes of the Ministry of Health Palu. 1(2), 59–64.

Kalsum, U., & Susanti, K. (2025). Factors Affecting the Incidence of Low Birth Weight Babies in Maternal Mothers. Scientific Journal of Obstetrics and Health (JIBI), 3(1), 35–43. https://doi.org/10.36590/jibi.v3i1.1458

Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

Kartasura, P., & Sukoharjo, K. (2025). Ghidza: Journal of Nutrition and Health of the Relationship between Postpartum Anxiety and Infant Nutritional Status (6-12 Months) and Exclusive Breastfeeding Patterns in the Work Area. 9(1), 51–57.

Khadijah. (2020). THE RELATIONSHIP BETWEEN MATERNAL CHARACTERISTICS AND THE GROWTH AND DEVELOPMENT OF TODDLERS DURING THE GOLDEN PERIOD OF 12-60 MONTHS. 11(2), 37–46.

Khoirunnisa, F. N. (2024). Midwifery Care Journal.

Kholifah, W. D. N., Nurrochmah, S., Alma, L. R., & Gayatri, R. W. (2023). Analysis of the Relationship between Maternal Education Level, Antenatal Care, Parity, and Exposure to Cigarette Smoke in Mothers with the Incidence of BBLR in the Working Area of the Arjuno Health Center, Malang City. Sport Science and Health, 5(2), 133–147. https://doi.org/10.17977/um062v5i22023p133-147

Kudus, D. (2024). Routine Report of Neonatus with Complications ET ET Kudus.

Kurniasih, D. U., & Ramawati, D. (2024). Early detection of growth disorders in high-risk infants through weight monitoring: A systematic review. Holistic Journal of Health, 18(5), 635–642. https://doi.org/10.33024/hjk.v18i5.326

Layuk, R. R. (2021). Descriptive Analysis of BBLR Risk (Low Birth Weight Infants) at Dr. Tadjuddin Chalid Makassar Hospital. Social Sciences and Education, 1(1), 1–11.

Liu, Y., Liu, J., Wen, B., Xiao, C., & Chen, Y. (2026). Neonatal and maternal adverse outcomes among low-risk nulliparous women compared with multiparous women at 37 – 41 weeks of gestation : a cohort study in South China. January, 1–8. https://doi.org/10.3389/fmed.2025.1691707

Maifita, M., & Armalini, R. (2022). The Relationship of Chronic Energy Deficiency (SEZ) in Pregnant Women with the Incidence of Low Birth Weight (BBLR) in the Working Area of the Pariaman Health Center. Journal of Clinical Sciences, 6(4657), 78–84. https://jurnal.syedzasaintika.ac.id

Meilini, I., Khairunnisa, & Sinaga, H. T. (2024). THE RELATIONSHIP BETWEEN SOCIODEMOGRAPHIC FACTORS AND DIET TO THE NUTRITIONAL STATUS OF TODDLERS IN BAKARAN BATU VILLAGE, DELI SERDANG REGENCY. Sec. 16.

Miraturrofi'ah, M., Kartini, D., & L. (2025). Risk Factors for Low Birth Weight Infants (Bblr): An Analysis of Maternal Nutritional Deficiency and Preeclampsia in Indonesian Urban Hospitals. National Journal of Health Research, 9(1), 73–80. https://doi.org/10.37294/jrkn.v9i1.648

Momoi. (2024). Science Keperawatan_30902300093_fullpdf.

Muzdalia, I., Immawanti, & Rasdiana3, I. (2022). Marendeng Health Journal. 6(1), 2809–2813.

Nurjanah, I., Novianty, K., Ningrum, A. S., & Syahrani, C. (2023). Factors related to the incidence of low birth weight. Formal Journal (Scientific Forum) Kesmas Respati, 8(1), 34. https://doi.org/10.35842/formil.v8i1.466

Nurmawati, I., Arum, P., Muna, N., Sutantio, R. A., Nurjihan, I., & Hanin, T. N. (2025). Maternal Factors Influencing Low Birth Weight in Newborns : A Retrospective Study. 20(3). https://doi.org/10.14710/jpki.20.3.209-215

Octarine, I., Hamid, S. A., & Sari, E. P. (2025). Factors Related to the Incidence of Low Birth Weight (BBLR) at Siti Fatimah Hospital, South Sumatra Province in 2023. 25(2), 1352–1356. https://doi.org/10.33087/jiubj.v25i2.6032

Pada, K., Di, B., Desa, P., & Lala, S. (2024). The relationship between birth weight and gestation period with growth and development in toddlers at the Posyandu of Sungai Lala Village. 8(2), 184–190.

Permatasari, C. P. (2021). Determinants of Incidence of Low Birth Weight at Wates Hospital. Yogyakarta Polytechnic, 1–61.

Purba, F. R. B., Hanum, P., Sinaga, J. M. M., Rafianef, G. Z., & Sianturi, F. (2025). The relationship between ANC visit history, parity and education with the incidence of BBLR at the Mariana Primary Clinic. Journal of Pharmaceutical and Sciences, 950–959. https://doi.org/10.36490/journal-jps.com.v8i2.877

Puteri, R. E., Rizqiea, N. S., & Priambodo, G. (2022). Overview of the Anxiety Level of Mothers Who Give Birth to Low Birth Weight (BBLR) in the Perinatology Room of ASY Syifa Boyolali Hospital. That is why we need to be vigilant in our daily lives. — Psalm 26, 1

Volume 4, Issue 2 (2026). 24-43
DOI: https://doi.org/10.60079/ahr.v4i1.704
OPEN ACCESS
e-ISSN: 2985-9808

Sari, H. D., Adiwinoto, R. P., & Yatmasari, E. (2023). Smoking habits of pregnant women with the incidence of low birth weight babies (bblr): a systematic review. Prominent Medical Journal, 4(2), 1–16. https://doi.org/10.37715/pmj.v4i2.4124

Septiasari1, Y., & Hasyim3, D. I. (2025). History of anemia and gestational age with stunting incidence in the work area of the pringsewu district health center. 14(2), 245–255.

Silaban, V. F., Masniar, M., Masna, M., & Marwani, M. (2024). The Relationship between Gestational Age, Pregnancy Distance and Pregnancy Complications, Antenatal Care and the Incidence of Low Birth Weight (BBLR). MAHESA: Malahayati Health Student Journal, 4(6), 2344–2353. https://doi.org/10.33024/mahesa.v4i6.14497

Sitorus, F., Surya Anita, & Dewi R Bancin. (2022). The Effect of Socioeconomic Status on the Incidence of Low Birth Weight Infants (BBLR). Journal of Reproductive Health, 7(2), 32–37.

Student, B. (2025). 1 , 2 , 3 123. 15(2), 20–29.

Sugion, 2022). (2020). Journal of Preventive Professional Nurse Research. British Medical Journal, 2(5474), 1333–1336.

Syahda, S., Hastuty, M., & Parmin, J. (2024). Analysis of factors related to the incidence of low birth weight (bblr) at Bangkinang Hospital, Kampar Regency. Journal of Nurses at the University of Pahlawan, 8(23), 194–197. https://journal.universitaspahlawan.ac.id/index.php/ners/article/view/23633

Syahida, A. I., Astuti, E. S., Ernawati, N., & Solikhah, F. K. (2025). Potential low birth weight as a risk factor for growth disorders in babies aged 0-12 months. 16, 496–500.

Tareke, A. A., Melak, E. G., Mengistu, B. K., Hussen, J., & Molla, A. (2024). Association between maternal dietary diversity during pregnancy and birth outcomes : evidence from a systematic review and meta-analysis.

Theresya, A. R. (2025). Agnes Rebekah Theresya. 24(2), 446–453.

Usni, Z. H., Palmizal, M., & Asifa, A. (2021). Socialization of the Application of Body Mass Index (BMI), Weight by Age (BB/U), Height by Age (TB/U), and Weight by Height (BB/TB) in Donomulyo Village. Journal of Sifa Pendidikan Intelligent, 10, 19–24. https://online-journal.unja.ac.id/csp

Warsini, K. T., Hadi, H., & Nurdiati, D. S. (2020). The history of KEK and anemia in pregnant women is not related to the incidence of stunting in children aged 6-23 months in Sedayu District, Bantul, Yogyakarta. Sec. 44.

Waruwu, M., Pu'at, S. N., Utami, P. R., Yanti, E., & Rusydiana, M. (2025). Quantitative Research Methods: Concepts, Types, Stages and Advantages. Scientific Journal of the Education Profession, 10(1), 917–932. https://doi.org/10.29303/jipp.v10i1.3057

Wigati, A., Puspitasari, I., Kulsum, U., Astuti, D., Kudus, U. M., No, J. G., & Email, I. (2023). MRS. O'NEILL WAS IN THE PROCESS OF GETTING A COPY OF THE LETTER FROM MRS. O'NEILL. 14(2), 354–360.

Zhou, J., Zhang, S., Teng, Y., Lu, J., Guo, Y., & Yan, S. (2023). Maternal pregnancy-related anxiety and children's physical growth : the Ma ' anshan birth cohort study. 1–12.

Corresponding author
Aisya Ratna Billa Dhayundra Putri Rajjata can be contacted at: 42022170017@std.umku.ac.id