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# ASSOCIATION OF PARITY AND INTERPREGNANCY INTERVAL WITH BIRTH WEIGHT AT PUSKESMAS MAMBORO

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**Abstract**

Infant mortality rate (IMR) is a parameter used for measuring a country's health status, with the majority of deaths occurring during the neonatal period. Low birth weight, which refers to infants weighing under 2500 grams at birth, accounts for approximately 34.5% of a factor contributing to neonatal mortality. Infant birth weight is influenced by maternal factors, including parity and birth spacing. Low birth weight cases at Mamboro Health Center remain a concern, with more than 20 cases in 2024, particularly because the area still includes a rural community. This research aims to analyze the relationship between parity and birth spacing with birth weight at Puskesmas Mamboro in 2024. This study used a quantitative analytical observational design, with 69 samples. The data were then analyzed using the Chi-square test. The result showed a relationship between parity and birth weight (p=0,003), with multiparous mothers having a lower risk of delivering low birth weight. Meanwhile, there was no significant relationship between pregnancy spacing and birth weight (p= 0,226). Although not statistically significant, the proportion of low birth weight cases was more common at too short and too long intervals compared with ideal intervals.

***Keywords:*** *Parity; Inter-Pregnancy Interval; Birth Weight*

## INTRODUCTION

Infant Mortality Rate (IMR) represents a major indicator used to assess the health status of a community. Although global improvements have occurred, efforts to reduce infant mortality remain a significant challenge for several regions. Most infant deaths occur at 0-28 days of life, which is the neonatal period. One of the risk factors for neonatal mortality is low birth weight (LBW), defined as an infant weighing less than 2500 grams. LBW is estimated to account for 34,5% of neonatal mortality and holds a crucial position in determining long-term child health and development outcomes (Kemenkes RI, 2022).

In Indonesia, the prevalence of low birth weight (LBW) continues to be a major public health concern and serves as an indicator of the quality of primary healthcare services. In the working area of Puskesmas Mamboro, LBW cases continue to be a health problem requiring special attention, with more than 20 cases of LBW recorded throughout 2024. This situation is compounded by the fact that the Mamboro area still includes rural communities with varying levels of education, which influences public knowledge, particularly among mothers, regarding health-related matters. The high number of cases necessitates for the identification of maternal factors associated with the incidence of LBW. Two major factors consistently

identified in the literature are parity and interpregnancy interval.

Maternal factors such as parity and interpregnancy interval are believed to influence the determination of infant's birth weight. Parity is defined as the total number of viable births a woman has experienced (Sari & Nurliah, 2022). Parity is associated with the physiological readiness of the uterus to support pregnancy. Multiparous mothers have a lower risk of delivering infants with low birth weight compared to primiparous mothers, as they have prior physiological adaptation from previous pregnancies. Conversely, high parity or grandmultipara is associated with an increased incidence of LBW due to the fatigue of the reproductive system (Fatmawati & Wati, 2021).

Interpregnancy interval refers to the time elapsed from the last childbirth to the beginning of subsequent pregnancy (Fatmawati & Wati, 2021). A very short interval (<2 years) and a very long interval (>5 years) have been associated with increased risk of LBW (Tessema et al., 2021). In 2005, the World Health Organization advised a minimum interval of 24 months or 2 years before trying to conceive again following a live birth. An ideal interpregnancy interval (2 years) provides sufficient time for mothers to restore their physiological and psychological conditions following the previous delivery (Wen et al., 2025).

Although various studies have confirmed the relationship between parity and interpregnancy interval with infant birth weight, study results at the local level often vary due to differences in sociodemographic characteristics and the quality of local health services. Therefore, data validation in the local context is necessary to ensure that intervention programs are accurately targeted. Based on the report of the relatively high number of LBW cases in the Puskesmas Mamboro and the crucial role of these maternal factors, this study was conducted with the primary aim of analyzing the relationship between parity and interpregnancy interval with birth weight in the working area of Puskesmas Mamboro in 2024. The finding of this study are expected to serve as a basis for developing more appropriate maternal and child health intervention programs in the Mamboro area.

## RESEARCH METHODS

This research uses a quantitative method with an analytical observational design using a cross-sectional approach. The study was conducted in the working area of Puskesmas Mamboro, located in North Palu District, Palu City, Central Sulawesi Province, which includes three sub-districts; Mamboro, West Mamboro, and Taipa. Data collection was carried out from May to June 2025 through 14 active Posyandu under the working area of Puskesmas Mamboro.

The population of this study consisted of all pregnant women who underwent examinations at Puskesmas Mamboro throughout 2024. The research sample was obtained using a purposive sampling technique based on predefined inclusion and exclusion criteria. The inclusion criteria consisted of: (1) mothers residing in the working area of Puskesmas Mamboro, (2) mothers who had their pregnancy examined at Puskesmas Mamboro, and (3) mothers whose data were recorded in medical records or Buku KIA (maternal and child health handbook). The exclusion criteria were: twin babies, mothers with chronic energy deficiency, and mothers suffering from chronic diseases. Based on the criteria and calculation using the Slovin formula, 69 respondents were obtained as the study sample.

Data were collected from both primary and secondary sources. Primary data were obtained through direct interviews, while secondary data were obtained from medical records and the KIA book. The independent variable included parity and interpregnancy interval. Parity consisted of primipara, multipara, and grandmultipara. The interpregnancy

interval was categorized into short spacing (<24 months), ideal spacing (24-59 months), and long spacing (≥ 60 months). The dependent variable was infant birth weight, divided according to WHO standards into low birth weight (<2500 grams) and normal birth weight (2500-4000 grams)

The collected data was then processed through univariate analysis to describe the characteristics of each research variable in the form of frequency distribution and percentages. Bivariate analysis was conducted to examine the statistical relationship between the independent and dependent variables. The statistical test used was the Chi-square, with the decision regarding the relationship determined based on the p-value <0,05. Data processing was conducted using a statistical software.

**RESULTS**

The results of this study are represented in the form of univariate analysis to describe the respondents characteristics and bivariate analysis to examine the relationship between parity and interpregnancy interval with infant birth weight. The study involved a total of 69 respondents in the working area of Puskesmas Mamboro throughout 2024.

**Table 1. Respondent Characteristics**

| Variable | Category | f | Percentage (%) |
|---|---|---|---|
| Age | <20 years | 14 | 20,3 |
| | 20-35 years | 44 | 63,8 |
| | >35 years | 11 | 15,9 |
| Living area | Mamboro | 16 | 23,2 |
| | Mamboro Barat | 7 | 10,1 |
| | Taipa | 46 | 66,7 |
| Educational background | SD | 8 | 11,6 |
| | SMP | 10 | 14,5 |
| | SMA | 26 | 37,7 |
| | D3 | 12 | 17,4 |
| | S1 | 12 | 17,4 |
| | S2 | 1 | 1,4 |
| Parity | Primipara | 25 | 36,2 |
| | Multipara | 34 | 49,3 |
| | Grandemultipara | 10 | 14,5 |
| Interpregnancy interval | Short interval | 14 | 20,3 |
| | Ideal interval | 32 | 46,4 |
| | Long interval | 23 | 33,3 |
| Birth Weight | BBLR | 21 | 30,4 |
| | Normal | 48 | 69,6 |

Table 1 shows that based on age characteristics, the majority of respondents were in the 20-35 year age group, totaling 44 individuals (63,8%). In terms of living area, most respondents lived in Taipa subdistrict, with 46 individuals (66,7%). Educational background characteristics indicate that the majority of the respondents had a final education level of senior high school (SMA), totaling 26 individuals (37,3%). Regarding parity characteristics, most respondents were in the multipara category, totaling 34 individuals (49,3%). In the distribution of interpregnancy interval characteristics, the majority of samples were in the ideal interval group, totaling 32 individuals (46,4%). Based on the characteristics of the infant birth weight variable,

it was found that most babies born had a normal birth weight, totaling 48 babies (69,6%).

**Table 2. Association between parity and infant birth weight**

| Parity | Birth Weight | | | | | | p |
|---|---|---|---|---|---|---|---|
| | LBW | | Normal | | Total | | |
| | n | % | n | % | n | % | |
| **Primipara** | 9 | 36,0 | 16 | 64,0 | 25 | 100 | 0,003 |
| **Multipara** | 5 | 14,7 | 29 | 85,3 | 34 | 100 | |
| **Grandmultipara** | 7 | 70,0 | 3 | 30,0 | 10 | 100 | |
| **Total** | **21** | **30,4** | **48** | **69,6** | **69** | **100** | |

Table 2 shows a statistitically significant relationship between parity and infant birth weight, with a result p-value= 0,003. In the primipara group, 36,0% of infants experienced LBW; in the multipara group, 14,7%; and in the grandmultipara group, the percentage increased to 70,0%. Thus, parity influences the incidence of LBW, with the highest risk observed among grandmultiparous mothers and the lowest risk in the multipara group.

**Table 3. Association between interpregnancy interval and infant birth weight**

| IPI | Berat Badan Lahir Bayi | | | | | | p-value |
|---|---|---|---|---|---|---|---|
| | LBW | | Normal | | Total | | |
| | n | % | N | % | n | % | |
| **Short interval** | 4 | 28,6 | 10 | 71,4 | 14 | 100 | 0,226 |
| **Ideal interval** | 7 | 21,9 | 25 | 78,1 | 32 | 100 | |
| **Long interval** | 10 | 43,5 | 13 | 56,5 | 23 | 100 | |
| **Total** | **21** | **30,4** | **48** | **69,6** | **69** | **100** | |

Table 3 shows the proportion of LBW in the short interpregnancy interval group was 28,6%, in the ideal interval group 21,9%, and in the long interval group increased to 43,5%. The Chi-square test yielded a p-value=0,226, indicating that there was no statistically significant relationship between interpregnancy interval and infant birth weight.

**DISCUSSION**

The results of this study show that the majority of respondents were in the 20-35 year age group, totaling 44 individuals (63,8%), which is considered a healthy reproductive age according to WHO. This indicates that the majority of pregnant women at Puskesmas Mamboro are within the ideal age for pregnancy. Meanwhile, there were 14 mothers (20,3%) who gave birth at the age of less than 20 years, and 11 mothers (15,9%) who gave birth at the age of over 35 years, both of which are categorized as high-risk maternal ages for maternal and neonatal complications. This finding is consistent with a study by Muu et al (2021), which reported that most delivering mothers at S.K Lerik Hospital in Kupang were within the 20-35 year age range, classified as productive age. Ages <20 years and >35 years are categorized as a high risk for mothers, leading to complications, miscarriage, and the birth of low birth weight infants. Pregnancies at very

young ages may be complicated due to the incomplete maturity of the reproductive organs, conversely, at an advanced maternal age, the process of nutrient transfer required by the fetus may be impaired, potentially resulting in LBW (Artini et al., 2023)

Based on Table 1, the majority of respondents were resided in Taipa Subdistrict, accounting for 46 individuals (66,7%). The remaining respondents were distributed across Mamboro Subdistrict with 16 individuals (23,2%) and West Mamboro Subdistrict with 7 individuals (10,1%). This indicates that Taipa Subdistrict is the area with the largest coverage of maternal healthcare services within the working area of Puskesmas Mamboro.

Table 1 summarizes that the majority of respondents had completed senior high school education (SMA), comprising 26 individuals (37,7%). This was followed by respondents with diploma (D3) and bachelor's degrees (S1), each accounting for 12 individuals (17,4%). Meanwhile, 10 respondents (14,5%) had completed junior high school (SMP), 8 respondents (11,6%) had primary school education (SD) and only 1 respondents (1,4%) had attained a master's degree (S2). These findings indicate that the majority of mothers in this study have completed secondary education, consequently possessing a foundational ability to receive, process, and understand health related information. This also consistent with the finding of Olariu et al (2025), which demonstrated that mothers with higher educational tend to have infants with better birth weight and gestasional age outcomes.

From the findings of this study regarding the relationship between parity and interpregnancy interval with infant birth weight, conducted in the working area of Puskesmas Mamboro, the distribution of parity showed that most mothers were multiparous, comprising 49,3% of the respondents, followed by primiparous mothers (36,2%) and grandmultiparous mothers (14,5%). These results suggest that the majority of mothers in this study possess previous experience with pregnancy and childbirth, which can influence their physical and psychological readiness for subsequent pregnancies. This finding is also consistent with previous research indicating that parity influences maternal health, as mothers with prior pregnancy experienced tend to maintain their health more effectively due to a better understanding of the necessary steps to manage their pregnancy (Dasa et al., 2022).

The distribution of interpregnancy intervals among the respondents shows that most mothers in the working area of Puskesmas Mamboro had an ideal interval, with 32 women (46,4%), followed by those with a long interval totalling 23 woman (33,3%), and those with a short interval totaling 14 woman (20,3%). The classification of short, ideal, and long intervals refers to WHO (2007), which recommends an optimal spacing from 2 to 5 years to minimize the risk of pregnancy complications for maternal health and delivery complication, particularly low birth weight. The high proportion of mothers with an ideal interpregnancy interval suggests that many women in this setting have implemented good reproductive planning in terms of timing, age, and both physical as well as psychological preparedness. This finding is supported by the research conducted by Fatimah (2023), who stated that ideal spacing tends to yield infants with minimal complications, including the incidence of infants born with a birth below 2500 grams.

The results for the birth weight variable show that most infants were born with a normal birth weight, totaling 48 infants (69,6%), while the remaining 21 infants (30,4%) were born with low birth weight. The proportion of LBW found in this study is relatively high compared with the national figures based on 2021 Indonesia Health Profile published by (Kemenkes RI, 2022), where the national incidence of LBW is in range 7-10%, such variations are particularly evident in

regions where access to healthcare services remains limited. This situations indicated that the incidence of LBW remains a critical maternal and child health issue that requires attention from healthcare provider especially at the primary care level. This finding is consistent with the research by Fatmawati & Wati (2021), who reported LBW prevalence of 39 cases at Cendrawasih Dobo Hospital and highlighted that LBW is influenced by multifactorial causes.

The analysis examining the association between parity and infant birth weight in Puskesmas Mamboro revealed a p-value of 0,003, indicating a statistically significant relationship between the two variables ($p<0,005$). The data distribution further demonstrated that mothers in multipara parity group deliverd infants with a substantially higher proportion of normal birth weight (85,3%), whereas primipara and grandmultipara group demonstrated a likelihood of delivering low birth weight infants.

These findings also align with existing theories suggesting that mothers with more than one previous birth generally possess greater experience and understanding of health maintenance during pregnancy which contributes to a lower risk of complications such as low birth weight (Fatmawati & Wati, 2021). In contrast, primiparous mothers tend to have less physical readiness and limited experience pregnancy, making them more vulnerable to complications (Azizah et al., 2024). Mothers with multiparous parity also tend to experience less intense pain. Their prior exposure to pregnancy and childbirth equips them with better familiarity and coping strategies, enabling them to manage the labor process and its associated pain more effectively (Dartiwen, 2023). In the grandmultipara group, the risk of LBW increases again due to the exhaustion of the reproductive system and diminished uterine function. Excessively high parity may also impair uteroplacental blood flow through increased resistance in the uterine arteries, compromising oxygen and nutrient delivery to the fetus, compounded by reduced maternal nutrient reserves due to repeated pregnancies in relatively short intervals (Başkiran et al., 2023).

The analysis of the association between interpregnancy interval and infant birth weight produced a p-value of 0,226 ($p>0,05$), indicating that there was no statiscally significant relationship between the two variables. Nevertheless, the data presented in Table 3 show descriptive variation, with the highest proportion of LBW (43,5%) observed in the gorup of mothers with a long pregnancy interval.

Theoretically, an ideal pregnancy interval allows sufficent time for mothers to restore nutritional reserves and re-establish hormonal balance following childbirth (Wen et al., 2025). Physiological recovery typically recquire approximately two years, shorter interval may heighten the risk of obstetric complications, including low birth weight. Conversely, an excessively long interval also poses potential risks, as the mother's physiological condition may revert to that of a first pregnancy due to a gradual decline in reproductive function (Prawirohardjo, 2020). This occurs because the mother's body tends to forget or lose the natural; phsyiological adaptations from the previous pregnancy; for instance, when the interval is too long, the uterine blood vessels that should have improved after earlier pregnancy may return to a pre-pregnancy state (Sujan et al., 2021)

However, the present study did not find a statistically significant association between interpregnancy interval and infant birth weight. This unexpected finding may be attributable to several factors, including the relatively small sample size, particularly within the LBW group. The homogeneity of maternal characteristics could also have reduced detectable variation. Additionally, potential confounders like nutritional status, adherence to antenatal care visits, and family support were not

directly assessed, which may have indluenced the results. It is also possible that mothers with non ideal intervals were more vigilant regarding pregnancy risk, thus mitigating potential adverse outcomes. Despite the lack of statistical significance, maintaining an interpregnancy interval of two to five years remains an important recommendation, as it helps to minimize complications and ensure the mother is in optimal condition prior to the next pregnancy. This finding is further supported by Marini (2023), who reported that other maternal factors such as age play a more substantial role in influencing infant birth compared to interpregnancy interval, which did not show a significant association.

## CONCLUSION

Based on the findings of this study concerning the association between parity and interpregnancy interval with infant birth weight in Puskesmas Mamboro working area in 2024, it can be concluded that, parity was found to have a statistically significant association with infant birth weight (p=0,003). In contrast, no significant association was observed between interpregnancy interval and infant birth weight (p=0,226).

## REFERENCES


Artini, N. K. M., Erawati, N. L. P. S., & Senjaya, A. A. (2023). Hubungan Paritas dan Usia Ibu dengan Kejadian Berat Badan Lahir Rendah di Rumah Sakit Umum Bali Royal Hospital . *Jurnal Ilmiah Kebidanan (The Journal Of Midwifery)*, *11*(1), 33–40. https://doi.org/10.33992/jik.v11i1.2312

Azizah, N., Martini, N., Gumilang, L., Dhamayanti, M., Tina, R., & Judistiani, D. (2024). *Hubungan faktor maternal dan kejadian bayi Berat Badan Lahir Rendah ( BBLR )*. *5*(1), 117–124. https://doi.org/10.34305/jmc.V5i1.1368

Başkiran, Y., Uçkan, K., & Çeleğen, I. (2023). Effect of grand multiparity on maternal, obstetric, fetal and neonatal results. *European Review for Medical and Pharmacological Sciences*, *27*(22), 10979–10984. https://doi.org/10.26355/eurrev_202311_34466

Dartiwen. (2023). Analisis Komparasi Tingkat Nyeri Persalinan Antara Primipara dan Multipara. *Jurnal Ilmu Keperawatan Dan Kebidanan*, *14*(1), 84–91.

Dasa, T. T., Okunlola, M. A., & Dessie, Y. (2022). Effect of grand multiparity on adverse maternal outcomes: A prospective cohort study. *Frontiers in Public Health*, *10*. https://doi.org/10.3389/fpubh.2022.959633

Fatimah, F. (2023). Hubungan Paritas, Jarak Kehamilan, dan Hipertensi pada Kehamilan dengan Kejadian BBLR di Puskesmas Bantargadung Tahun 2021. *Open Access Jakarta Journal of Health Sciences*, *2*(2), 562–569. https://doi.org/10.53801/oajjhs.v2i2.101

Fatmawati, E., & Wati, D. R. (2021). Hubungan Paritas Dengan Berat Badan Lahir Rendah (BBLR). *IJMT : Indonesian Journal of Midwifery Today*, *1*(1), 49. https://doi.org/10.30587/ijmt.v1i1.3419

Kemenkes RI. (2022). Profil Kesehatan Indonesia 2021. In *Pusdatin.Kemenkes.Go.Id*.

Marini, M., Solechah, S. A., Fathullah, D. M., Suryani, N., Yulidasari, F., Setiawan, M. I., & Rahayu, A. (2023). Hubungan Usia Ibu, Kadar Hemoglobin, dan Status KEK saat Kehamilan dengan Berat Badan Lahir Bayi. *Ghidza: Jurnal Gizi Dan Kesehatan*, *7*(2), 296–304. https://doi.org/10.22487/ghidza.v7i2.1009

Muu, M. E. H., Tat, F., & Nahak, M. P. M. (2021). Hubungan Karakteristik Ibu (Usia dan Paritas) dengan Kejadian Berat Badan Lahir Rendah (BBLR) di RSUD S. K Lerik Kupang. *Chmk Midwifery Scientific Journal*, *3*(2), 6.

Olariu, S., Novacescu, D., Cîtu, C., Buciu, V. B., S, D. M., Sas, I., & Ionac, M. (2025). *The Impact of*

*Maternal Education on Neonatal Outcomes in Preeclamptic Pregnancies from a Low-Resource Settings*. 1–16.

Prawirohardjo, S. (2020). *Ilmu Kebidanan* (4th ed.). Jakarta : Bina Pustaka Sarwono Prawirohardjo, 2020.

Sari, M. H., & Nurliah. (2022). Hubungan Paritas Dan Umur Ibu Dengan Kejadian Perdarahan Post Partum. *Journal of Nursing and Midwifery*, *Volume 4 n*((1)), 1–10.

Sujan, A. C., Class, Q. A., Rickert, M. E., Van Hulle, C., & D'Onofrio, B. M. (2021). Risk factors and child outcomes associated with short and long interpregnancy intervals. *Early Child Development and Care*, *191*(14), 2281–2292. https://doi.org/10.1080/03004430.2019.1703111

Tessema, G. A., Marinovich, M. L., Håberg, S. E., Gissler, M., Mayo, J. A., Nassar, N., Ball, S., Betrán, A. P., Gebremedhin, A. T., de Klerk, N., Magnus, M. C., Marston, C., Regan, A. K., Shaw, G. M., Padula, A. M., & Pereira, G. (2021). Interpregnancy intervals and adverse birth outcomes in high-income countries: An international cohort study. *PLoS ONE*, *16*(7), 1–17. https://doi.org/10.1371/journal.pone.0255000

Wen, X., Liang, W., Zhai, J., Wang, Y., Zheng, P., & Wang, S. (2025). The association between interpregnancy intervals and preterm birth: a systematic review and meta-analysis. *BMC Pregnancy and Childbirth*, *25*(1). https://doi.org/10.1186/s12884-025-07259-y

WHO. (2007). *Birth spacing — report from a WHO technical consultation*. 1–4. http://apps.who.int/iris/bitstream/10665/73710/1/RHR_policybrief_birthspacing_eng.pdf