Maternal Factors Associated with Low Birth Weight among Newborns at Maharaj Nakorn Chiang Mai Hospital

Author : Nipapat Panasan
Advisor : Assoc. Prof. Dr. Patrinee Traisathit , Co-Advisor : Dr. Suttipong Kawilapat
Department of Statistics, Faculty of Science, Chiang Mai University

FACULTY OF SCIENCE
CHIANG MAI UNIVERSITY

Low birth weight (LBW) remains a major public health concern, as it is strongly associated with increased neonatal morbidity, long-term adverse health outcomes, and substantial socioeconomic and healthcare burdens. This study aimed to determine the prevalence of LBW and to identify maternal factors associated with LBW among newborns delivered at Maharaj Nakorn Chiang Mai Hospital. A retrospective study was conducted using medica record data. The study sample comprised 280 mothers who delivered in 2024. LBW was defined as a birth weight of less than 2,500 grams. The results showed that the prevalence of LBW was 10.0%. Multiple logistic regression analysis revealed that increased gestational age (aOR = 0.332) and greater maternal weight gain during pregnancy (aOR = 0.887) were significantly associated with a reduced risk of LBW. These findings underscore the importance of comprehensive antenatal care, particularly close monitoring of gestational age and maternal weight gain during pregnancy. Early identification and effective management of high-risk pregnancies may contribute to improved neonatal health outcomes and a reduction in the burden associated with low birth weight.

Background

Low birth weight (LBW), defined as a birth weight of less than 2,500 grams, is associated with a wide range of neonatal complications, including respiratory distress, heart failure, neurological impairment resulting from hyperbilirubinemia, and hypothermia, which may adversely affect organ function. In addition, long-term consequences of LBW include delayed growth and development, impaired immune function, and an increased risk of chronic diseases such as diabetes mellitus and hypertension later in life. This condition also places substantial emotional, social, and financial burdens on families and healthcare systems [Phanthumaphon U., 2020; Khunpradit S., 2004]. Globally, the prevalence of LBW accounts for approximately 14.6% of all live births [United Nations Children's Fund; World Health Organization, 2019], while in Thailand the prevalence is reported at 10.4% [Bureau of Reproductive Health, 2023], exceeding the World Health Organization's recommended target of no more than 7%.

Objectives

This study aimed to determine the prevalence of LBW infants and to identify maternal factors associated with LBW among newborns delivered at Maharaj Nakorn Chiang Mai Hospital.

Variables

Qualitative variables
- Gestational hypertension

Quantitative variables
- Maternal age
- Gestational age at delivery
- Body mass index (BMI)
- Maternal weight gain during pregnancy
- Parity (number of pregnancies)

Statistical analysis

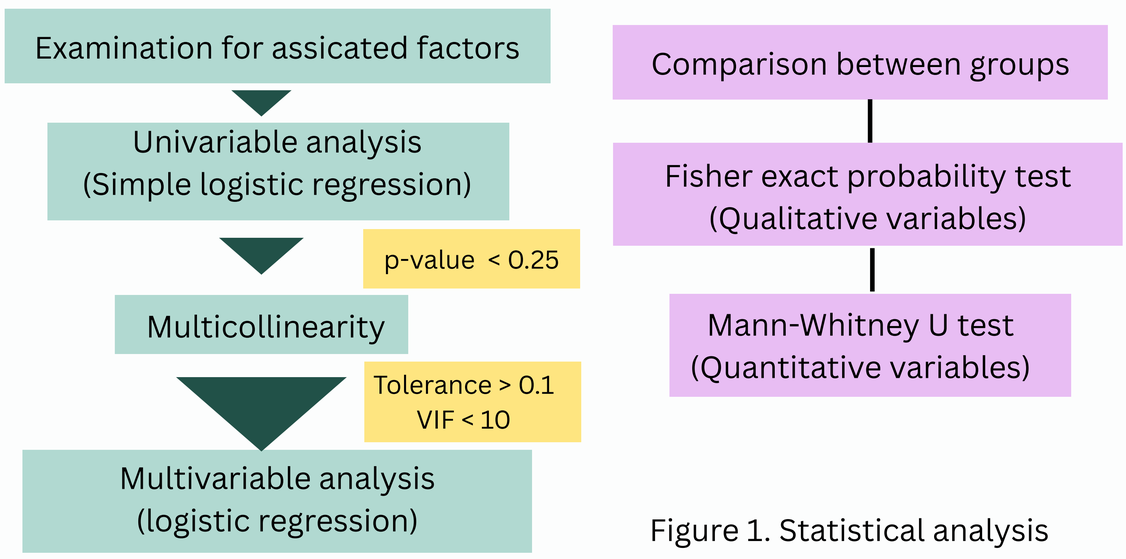


Figure 1. Statistical analysis

Methodology

This retrospective study used medical record data from singleton pregnancies delivered at Maharaj Nakorn Chiang Mai Hospital between January and December 2024.

Data collection was performed using standardized data recording forms, and statistical analysis was conducted using IBM SPSS Statistics.

SPSS

Results

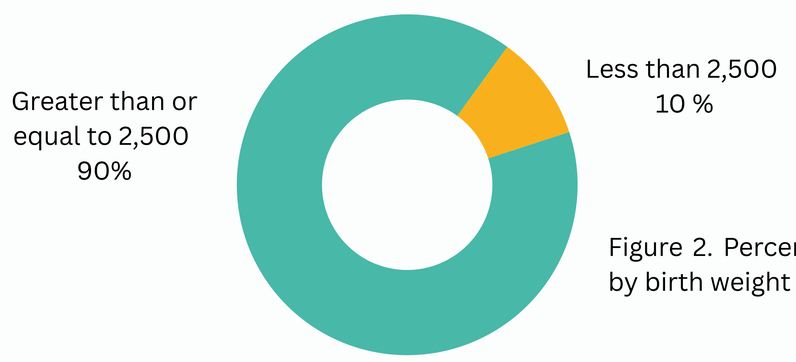


Figure 2. Percentages of infants by birth weight group.

Table 1 Results of Multiple logistic regression analysis of maternal factors associated with low birth weight at Maharaj Nakorn Chiangmai Hospital

Variables	aOR	95% CI		p-value
		Lower	Upper	
Gestational age at delivery (weeks)	0.332	0.224	0.49	< 0.001
Maternal weight gain during pregnancy (kg)	0.887	0.808	0.972	0.011
Parity (number of pregnancies)	1.229	0.819	1.844	0.319
Gestational hypertension				
Yes	1.569	0.325	7.579	0.575
No	1	-	-	-

aOR = Adjusted odds ratio ; 95% CI = 95% Confidence Interval
p-value = p-value from the multiple logistic regression analysis

Multiple logistic regression analysis revealed that maternal factors significantly associated with low birth weight were gestational age at delivery and maternal weight gain during pregnancy. These findings are consistent with previous studies by Chuea Mor Thao (2023) and Trainapakul (2017), which reported that a gestational age of less than 37 weeks is a significant risk factor for low birth weight. In addition, a study by Lueangsuwan (2022) indicated that appropriate maternal weight gain during pregnancy has a positive effect on fetal growth and development.

Specifically, the odds of delivering a low birth weight infant decreased by 0.332-fold for each additional week of gestation, while the odds decreased by 0.887-fold for each additional kilogram of maternal weight gained during pregnancy. Other maternal factors, including parity and gestational hypertension, were not found to be significantly associated with low birth weight.

Conclusion

This study found that shorter gestational age and inadequate maternal weight gain during pregnancy were associated with an increased risk of low birth weight. Therefore, close monitoring of gestational age and appropriate maternal weight management during pregnancy are essential for the prevention of low birth weight.

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