

**RELATIONSHIP BETWEEN MATERNAL BMI, GESTATIONAL WEIGHT GAIN AND NEONATAL BIRTH WEIGHT IN MATHURATA MOH AREA**

**Y.R.S.E.W.B.W.M.R.S.G. Yatiwelle\* and D.A. Gunawardane**

*Postgraduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka.*

*\*sathsarayatiwelle22@gmail.com*

Epidemiological studies globally have demonstrated that maternal pre-pregnancy body mass index (BMI) and gestational weight gain (GWG) are key determinants of maternal and neonatal outcomes. However, evidence remains limited in the Sri Lankan context. Nuwara Eliya District reports a high prevalence of low birth weight (LBW) of about 25% compared to the national average of 17%. Within the Mathurata MOH area, this rate rises to nearly 30% underscoring a critical public health concern. This analytical cross-sectional study aimed to describe pre-pregnancy BMI and GWG and explore their association with neonatal birth weight among pregnant mothers registered in the Mathurata MOH area from 01<sup>st</sup> January 2020 to 31<sup>st</sup> December 2022. The inclusion criteria were pregnant mothers registered with Public Health Midwives who had weight measurements taken before 12 weeks of gestation and were followed until delivery with weight recorded at or after 37 weeks. Mothers under 18 years and twin pregnancies were excluded. Of 1052 eligible births, 421 were selected using random sampling and categorised into BMI and GWG groups. Data were analysed using chi-square and ANOVA tests. Results revealed significant associations between pre-pregnancy BMI and lower segment caesarean section (LSCS), gestational diabetes mellitus (GDM) and prepregnancy diabetes ( $p < 0.001$ ,  $p < 0.002$ , and  $p < 0.001$  respectively). Pre-pregnancy BMI was also strongly associated with neonatal birth weight ( $p < 0.001$ ), with underweight mothers more likely to deliver LBW infants (73.3%). Pre-pregnancy BMI was significantly associated with GWG ( $P < 0.001$ ), with the majority of underweight women experiencing inadequate weight gain (74.14%). Similarly, GWG showed significant associations with neonatal birth weight, LSCS, pre-pregnancy diabetes and GDM ( $p < 0.001$ ,  $p < 0.001$ ,  $p < 0.001$ , and  $p < 0.042$  respectively). In conclusion, maternal pre-pregnancy BMI and GWG are crucial determinants of neonatal birth weight. These findings highlight the urgent need for weight management strategies during pregnancy, particularly in high-risk areas like Mathurata in the Nuwara Eliya District, to improve maternal and neonatal health outcomes.

**Keywords:** Birth weight, Gestational weight gain, Maternal nutrition, Pre-pregnancy BMI, Sri Lanka