

ABSTRACT  
A RETROSPECTIVE STUDY OF THE RELATIONSHIP BETWEEN BODY MASS INDEX  
AND POSTPARTUM BLOOD LOSS

Shannan Cantu Santoli, MSN, CNM

Marquette University, 2026

The body mass index (BMI) of pregnant individuals in the US is increasing. While BMIs in the National Academy of Medicine (NAM) obesity classification are associated with longer labors and higher rates of cesarean birth, the influence of BMI on the third stage of labor (TSL) and postpartum hemorrhage (PPH) is understudied. The purpose of this study was to describe the relationships: (1) between measures of BMI and quantitative blood loss (QBL) in people with low-risk pregnancies; (2) between gestational weight gain (GWG) and QBL; and (3) between BMI and TSL duration. Using the Neuman Systems Model, a descriptive correlational design was used. A retrospective analysis of deidentified data from electronic health records was performed of all pregnant people who birthed vaginally at a large Midwestern health system between January 2019 and June 2024. Cases with no QBL documented, cesarean birth, multiple gestation, preterm birth, or other medical risk factors were excluded. Of 14,448 cases included, 98 (0.68%) met criteria for PPH. While there was no significant association between BMI at the first prenatal visit and blood loss  $\geq 500$  mL, there was with BMI at the last prenatal visit,  $p < .005$ . Using that measure, average QBL increased significantly across BMI categories, rising from underweight to obese. In a logistic regression, BMI at the first and last prenatal visits did not predict the likelihood of QBL  $\geq 500$  mL, however BMI at labor admission was a significant predictor ( $p = .039$ ). QBL was significantly higher when GWG exceeded NAM recommendations ( $p < .001$ ; -17, 95% CI [-25, -8]). Although mean TSL duration was longer in higher BMI categories ( $p < .001$ ), there were no significant differences when the TSL was  $> 15$  minutes. PPH defined by QBL  $\geq 1,000$  was rare in this low-risk sample. Although increasing BMI was directly associated with increased QBL, it was not a significant predictor of PPH. GWG that exceeds recommendations may increase QBL. TSL duration was not significantly associated with BMI. More prospective research is needed to verify these findings and investigate the role of BMI and GWG in TSL management.