

# Maternal Shoe Size and Infant Birth Weight: Correlation or Fiction?

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**Objective:** To determine whether maternal prepregnancy shoe size can be used to reliably predict infant birth weight.

**Method:** This is a cross-sectional study of 111 consecutive patients admitted to the maternity care unit of a small community hospital. Data collected included prepregnancy height, maternal weight, maternal shoe size, maternal age, gravidity, parity, ethnicity, and method of delivery. Infant birth weight was recorded within the first 2 hours of life.

**Results:** There was no correlation between maternal shoe size and birth weight ( $r = 0.01$ ;  $P = \text{NS}$ ). There was no correlation between shoe size and birth weight when corrected for parity and ethnicity.

**Conclusion:** There is no correlation between maternal shoe and infant birth weight. This anthropometric measure should not be used to estimate infant birth weight. (J Am Board Fam Med 2006;19:426–8.)

Medical practice is replete with urban legends and “old wives tales.” Many of these pertain to issues of women’s health and reproductive medicine. A unique set of these parameters centers on trying to predict the gender or size of the unborn fetus. For example, it has been widely rumored that women who carry the baby low will deliver a boy, whereas women who carry high will deliver a girl.

Another less publicized legend suggests that a woman’s shoe size, in standard Western measurements, correlates with (and therefore can be used to predict) her newborn baby’s birth weight in pounds. For example, a woman with a pregnancy shoe size of 7 will deliver a 7-pound baby. Although several studies have examined the relationship between shoe size and mode of delivery,<sup>1–4</sup> a focused review of the English-speaking literature reveals no prior studies specifically investigating a relationship between maternal shoe size and birth weight.

The objective of the present investigation was to determine the scientific validity of the relationship between maternal prepregnancy shoe size and subsequent infant birth weight using an unselected prospective cohort of parturients. Our null hypothesis was that there is no correlation between maternal shoe size and birth weight.

## Materials and Methods

This was a cross-sectional study. The subjects were a sample of patients who presented for maternity care at Naval Hospital Camp Lejeune, North Carolina. Naval Hospital Camp Lejeune is a military community hospital serving active-duty service members and their dependents. The hospital performs 1800 deliveries annually. Exclusion criteria included patients who presented at less than 36 weeks of gestation, and those with gestational diabetes. General descriptive statistics (SPSS version 11.0) were used for group demographics. Pearson’s product correlation coefficient calculations were used to determine the linearity and strength of the relationship between maternal shoe size and birth weight. An a priori sample size calculation indicated that to show a correlation between maternal shoe size and infant birth weight, using a 95% CI and a  $\beta$  of 0.2, we would need to enroll 105 patients.

Following approval from the institutional review board, consent was obtained from each participant the morning following her delivery. We collected

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**Conflict of interest:** none declared.

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**Table 1. Study Population Demographics**

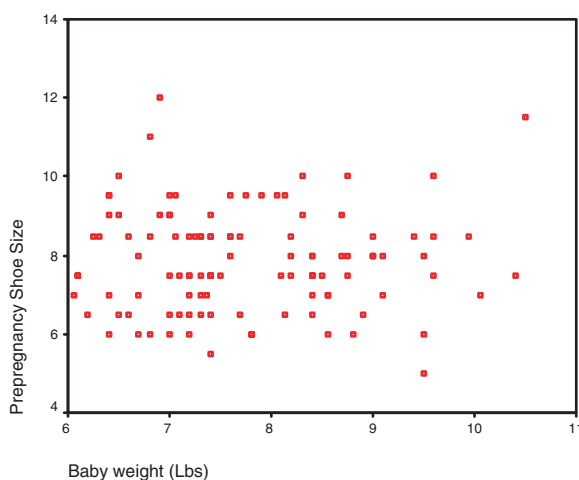
	N (%)	Mean (range)	SD
Ethnicity			
Caucasian	82 (72)		
African American	14 (14)		
Asian	4 (4)		
Hispanic	10 (9)		
Not reported	1 (1)		
Age		25 (17–37)	5
Body mass index (kg/m <sup>2</sup> )		24 (16–50)	5
Gravity		2 (0–5)	1
Parity		0.7	0.9

consecutive data from all women presenting for care during the month of March 2005. Prenatal records were reviewed to obtain nominal values for age, gravidity, parity, ethnicity, prepregnancy weight, and prepregnancy height using standard American College of Obstetricians and Gynecologists maternity care forms. Inpatient medical records were reviewed to determine the method of delivery (spontaneous vaginal delivery, operative vaginal delivery, or cesarean section). The indication for operative delivery, if applicable, infant weight and infant length were collected from standard inpatient labor documents. To facilitate comparison with standard western shoe measurements that are reported in full and half sizes only, infant birth weight was recorded in pounds and ounces and rounded to the nearest tenth of a pound. Maternal shoe size was defined in whole numbers with interval half-sizes as appropriate. Prepregnancy shoe size was based on maternal recall.

**Results**

We obtained data from 111 consecutive postpartum women. One patient refused to participate. Basic demographic data are presented in Table 1. Forty-nine subjects were primigravid (44.1%). There were 80 vaginal deliveries (72.1%), 4 vacuum assisted deliveries (3.6%), and 27 cesarean deliveries (24.3%). Body mass indices ranged from 16.1 kg/m<sup>2</sup> to 49.7 kg/m<sup>2</sup>, with a mean of 24.9 kg/m<sup>2</sup> (SD = 5 kg/m<sup>2</sup>). There were 6 women over age 35 (5.4%). The mean age of surveyed women was 25. Prepregnancy shoe sizes ranged from 5 to 12, with a mode of 7½.

There was no correlation between maternal shoe size and infant birth weight (Pearson correla-



**Figure 1. Scatterplot of Infant Birth Weight and Maternal Shoe Size**

tion 0.01; *P* = NS; Figure 1, Table 2). In addition, there was no correlation between shoe size and birth weight or shoe size and mode of delivery when adjusting for gravidity, parity, and ethnicity.

Infant birth weight, however, did correlate with maternal body mass index (Pearson correlation = 0.20; *P* < .03) and mode of delivery. Women with higher body mass indices were more likely to have heavier babies, and heavier babies were more likely to be delivered operatively (Pearson correlation = 0.25; *P* < .01). Maternal body mass index also correlated with the mode of delivery (Pearson correlation = 0.30; *P* < .01). Women with higher body mass indices were more likely to be delivered operatively.

**Table 2. Correlation of Shoe Size and Birth Weight by Subgroup**

Subgroup	N (%)	<i>P</i> Value	Pearson Coefficient
Entire sample	111	.93	0.01
Caucasian	82 (72)	.80	0.02
African American	14 (14)	.19	−0.36
Race: Other*	15 (14)	.41	0.22
Primiparous	49 (44)	.97	0.01
Vaginal delivery	80 (72)	.53	0.07
Cesarean	27 (24)	.33	−0.19
Vacuum-assisted delivery	4 (4)	.83	−0.16
BMI <30	94 (85)	.77	0.03
BMI >30	17 (15)	.31	−0.25
Age >35	6 (5)	.01	0.89
Age <35	105 (95)	.67	−0.04

\*Asian, Hispanic, Pacific Islander.

## Discussion

Until the late 1980s, there was a long-held belief in European maternity care circles that a mother's shoe size had an important bearing on the outcome of labor.<sup>3</sup> In the United States before 1981, certain institutions held that women with a shoe size of less than 5½ were at a significantly higher risk for cephalopelvic disproportion.<sup>7</sup> In Europe and America, this relationship contributed to the suggestion that a mother's shoe size could be used to predict her infant's birth weight.

Our study, however, indicates that the Anglo-American "old-wives tale" of shoe size predicting infant birth weight is unfounded. We found no scientific correlation between maternal shoe size and infant birth weight. Ours is the first study to specifically examine a potential correlation between shoe size and infant birth weight. In an anthropometric study of European primigravidas, Mahmood<sup>4</sup> reported that heavier babies were more likely to be delivered by cesarean section, but found no correlation with infant weight and maternal height or shoe size.

Other studies have examined maternal shoe size in relation to cephalopelvic disproportion.<sup>1,2,5</sup> None of these studies found a correlation between maternal shoe size and mode of delivery. Our study supports this literature because we also did not find a correlation between shoe size and mode of delivery.

Our study does, however, have several important limitations. By relying on patient self-report for prepregnancy shoe size, height and weight, we may have introduced bias into the study. Had the study been prospective, objective measurement of the anthropometric data could have been implemented at the beginning of their prenatal course. In addition, it should be noted that our sample ethnicity, as well as the number having health insurance (all military beneficiaries are insured), is not reflective of the

general U.S. population. The ethnicity of our sample is, however, consistent with that of the populations from which the shoe size–birth weight legend derives.

The distribution of the mode of delivery in our study was consistent with national cesarean rates cited by the National Center for Health Statistics.<sup>6</sup> We also achieved our desired sample size, thus decreasing our chance of a type II error.

In summary, there is no objective evidence that prepregnancy maternal shoe size correlates with infant birth weight. The use of this anthropometric measure, as a surrogate predictor of infant birth weight, is not valid and should be discouraged. Providers should base their assessment of fetal weight on accepted clinical techniques such as Leopold's maneuvers or ultrasound.

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