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Pregnancy Intention and Contraceptive Use among Women by Class of Obesity: Results from the 2006–2010 and 2011–2013 National Survey of Family Growth

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A B S T R A C T

Objective: Conflicting research findings on the association of obesity and pregnancy intention may be due to their collective definition of obesity at a body mass index of 30 kg/m^2 or greater. However, obese women with a BMI of 40 kg/m^2 or greater may be both behaviorally and clinically different from obese women with a lower BMI. This study reexamines this relationship, stratifying by class of obesity; the study also explores variations in contraceptive use by class of obesity given their potential contribution to the incidence of unintended or unwanted pregnancy.

Methods: This study combined data from the 2006 through 2010 and 2011 through 2013 US National Survey of Family Growth. Pregnancy intention (intended, mistimed, unwanted) and current contraceptive use (no method, barrier, pill/patch/ring/injection, long-acting reversible contraceptive, sterilization) were compared across body mass index categories: normal (18.5–24.9 kg/m kg/m^2), overweight (25.0–29.9), obese class 1 (30.0–34.9 kg/m^2), class 2 (35.0–39.9 kg/m^2), and class 3 ($\geq$40 kg/m^2, severe obesity). Weighted multinomial logistic regressions were refined to determine independent associations of body mass index class and pregnancy intention, as well as contraceptive method, controlling for demographic, socioeconomic, and reproductive factors.

Results: Body mass index data were available for 9,848 nonpregnant, sexually active women who reported not wanting to become pregnant. Women with class 3 obesity had significantly greater odds of mistimed (adjusted odd ratio [aOR], 1.67; 95% confidence interval [CI], 1.02–2.75) or unwanted (aOR, 1.96; 95% CI, 1.15–3.32) pregnancy compared with normal weight women. Women with class 2 or 3 obesity were more likely to not be using contraception (aOR, 1.53–1.62; 95% CI, 1.04–2.29). Although women with class 2 obesity were more likely to be using long-acting reversible contraceptive methods and sterilization over short-acting hormonal methods (aOR, 1.67; 95% CI, 1.08–2.57; aOR, 2.05; 95% CI,1.44–2.91), this association was not observed among women with class 3 obesity.

Conclusions: Women with class 3 obesity are at greater risk of unintended pregnancy and are less likely to be using contraception than normal weight women. Whether these findings are related to patient and/or provider barriers that are not as visible among women with class 1 and class 2 obesity warrants further investigation.

The United States maintains one of the highest rates of both unintended pregnancy and obesity worldwide. Nearly one-half (45%) of U.S. pregnancies are unintended (Finer & Zolna, 2016) and estimates from the 2009 through 1010 National Health and Nutrition Examination Survey suggest that nearly one-third (32%) of women aged 20 to 39 years are obese (Flegal, Carroll, Kit, & Ogden, 2012).

Unintended pregnancies are associated with late initiation and inadequate use of prenatal care (Mosher, Jones, & Abma, 2012), which have been linked to adverse perinatal outcomes such as prematurity and low birth weight (Gipson, Koenig, & Hindin, 2008). Similarly, pregnancies affected by maternal obesity are associated with greater risk of adverse outcomes for both the mother and the newborn, with effects in the neonate

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extending into childhood (Barbour, 2014; El-Chaar et al., 2013; Robinson, O'Connell, Joseph, & McLeod, 2005; Santangeli, Sattar, & Huda, 2015; Whitaker, 2004). The documented health risks associated with both risk factors make the prevention of unintended pregnancy among obese women a public health priority. Additionally, because both unintended pregnancy and obesity are disproportionately distributed among minority women living below the poverty line (Jones, Finer, & Singh, 2010; Le Marchand, Yoshizawa, & Nomura, 1988; Levine, 2011; Ogden & Carroll, 1963), they may contribute to the disproportionate incidence of induced abortion (Jerman, Jones, & Onda, 2016), as well as pregnancy-related mortality (Bryant, Worjoloh, Caughey, & Washington, 2010) concentrated among low-income, minority women. To develop effective interventions and apply them to the most appropriate populations, a better understanding of the association of obesity, contraceptive use, and unintended pregnancy is needed.

Whether obesity is an independent risk factor for unintended pregnancy is unclear. A study using the 2002 National Survey of Family Growth (NSFG) found no association between obesity and the risk of unintended pregnancy (Kaneshiro, Edelman, Carlson, Nichols, & Jensen, 2008). In contrast, Brunner Huber and Hogue (2005) found a 1.73 to 1.75 times higher odds of unintended pregnancy among overweight and obese women with live-born infants using the Pregnancy Risk Assessment Monitoring System (PRAMS) database. This association was further confirmed among women with class 3 obesity in a later examination of PRAMS data in New York City; these women had 2.81 (95% confidence interval [CI], 1.41–5.60) times the odds of unwanted pregnancy compared with their normal weight counterparts (Garbers & Chiasson, 2013). However, because the PRAMS database only included women delivering live-born infants, results from these studies could have been biased by differential rates of pregnancy termination. Specifically, normal weight women may detect their pregnancies earlier and thus face less difficulty obtaining an abortion as compared with women with obesity who may recognize their pregnancy later (Foster et al., 2008) or who may be unable to access a facility equipped to provide them with care (Ingraham, Roberts, & Weitz, 2014).

According to data from the 2006 through 2010 NSFG, more than one-half of nonsterilized women with obesity who were at risk of unintended pregnancy reported not using contraception or relying on less effective, nonprescription methods such as barriers or withdrawal (Callegari et al., 2014). With respect to the independent influence of obesity on contraceptive decisions, a study of 1,015 young women aged 16 to 24 attending a publicly funded family planning clinic did not find variations in contraceptive use by body mass index (BMI) category (DeMaria, Lugo, Rahman, Pyles, & Berenson, 2013). In contrast, a single-site survey of 987 privately insured patients aged 18 to 40 years noted that overweight and obese women were two times more likely than their normal weight counterparts to be using long-acting reversible contraceptive (LARC) methods than prescription methods (Bhuva, Kraschnewski, Lehman, & Chuang, 2017).

The increasing prevalence of severe, class 3 obesity among women may also factor into the variations in pregnancy intention and contraceptive use noted in previous research. Between 1986 and 2000, the prevalence of class 3 obesity quadrupled (Sturm, 2003). More recent measures show continued growth in its prevalence at 6.6% among the U.S. population in 2010 and disproportionately distributed among women (Strum & Hattori, 2013). Because pregnant women with class 3 obesity experience an even greater risk of poor pregnancy outcomes beyond that experienced by women with class 1 and 2 obesity (Cedergren, 2004; Marshall, Guild, Cheng, Caughey, & Halloran, 2010), they may also represent an at-risk subgroup with distinct characteristics, pregnancy beliefs, and contraceptive behaviors. In 2015, the NSFG released data collected from 2011 to 2013. Its combination with data from 2006 through 2010 provides a larger population of women with class 3 obesity such that variations in the occurrence of unintended (mistimed or unwanted) pregnancies and women's contraceptive use can be determined.

Materials and Methods

Survey

The NSFG is a publicly available, population-based database that includes information on reproductive health and behavior. Given the similar format and absence of definition changes between the 2006 through 2010 and 2011 through 2013 surveys, we combined the two iterations of the cross-sectional survey, increasing the surveyed population to 17,880 women, 15 to 44 years of age, living in the United States. Sampling weights were based on national averages of race, ethnicity, and age from the U.S. Census Bureau (U.S. Department of Health and Human Services, 2014). A more complete description of sampling methods and survey design is provided in previous publications (Groves, Mosher, Lepkowski, & Kirgis, 2009). Because the database is publicly available and includes no identifiers, this study was exempt from institutional board review.

Study Population

Although the NSFG provides data on young women (age 15–19 years), they were not included, because the significance of BMI in this population depends on age- and sex-specific changes in body fat (Centers for Disease Control and Prevention, 2014). Underweight (BMI $<$ 18.5 kg/m^2) respondents were also excluded, given research showing a separate demographic and pregnancy risk profile for underweight women (Hoellen et al., 2014; Sichieri, Everhart, & Hubbard, 1992). The study population thus included female respondents aged 20 to 44 years for whom self-reported BMI data (current weight, kg/m^2) was provided. Women who were not sexually active in the last 3 months and women who were pregnant or seeking to be pregnant were excluded. Because sterilization is still an elective method of contraception, women who had tubal ligation or hysteroscopic sterilization and women with vasectomized partners were included. Women with a history of surgery resulting in sterility (e.g., hysterectomy, bilateral salpingectomy or oophorectomy) were excluded.

Study Variables

The primary outcome of interest was women's report of pregnancy intention for pregnancies occurring in the 5 years before her being surveyed. Pregnancy intention was categorized in one of three ways: intended, unwanted, or mistimed. Women were categorized as having had an unwanted pregnancy if they reported not wanting to have any or any more children before becoming pregnant. Mistimed pregnancies were defined as those that occurred earlier than desired, but would have been desired later. All other pregnancies, including those occurring later than desired and those for which timing did not matter,