Body Size, Fertility, and Reproductive Justice: Examining the Complex Interplay between BMI, Reproductive Health, and Access to Care

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Abstract: The relationship between obesity and reproduction is highly complex. While there are clear obstetrical and fertility risks associated with elevated BMI, it is less clear how weight loss impacts these outcomes. Increasingly, patients considered obese according to BMI are being denied access to fertility care, thus leaving them without treatment options for their disease (infertility). Notably, BMI cutoffs disproportionately affect historically marginalized populations in the United States and people of lower socioeconomic status (SES). This paper uses a reproductive justice framework to discuss access to reproductive healthcare based on BMI. In doing so, we connect obesity to larger systems of structural inequalities. We conclude that rather than strict BMI cutoffs, a more holistically patient-centered approach is appropriate taking into account the overall health of the individual, available scientific data, clinical capabilities, and the patient’s value system. This will ultimately make reproductive medicine more accessible to all patients.

Keywords: obesity; reproductive health care; infertility; reproductive justice

1. Introduction

Obesity rates continue to climb, such that 42.4% of American adults are considered to have obesity (BMI $\geq 30$ kg/m$^2$) [1]. Obesity is a chronic disease with a number of well-known health consequences such as increased rates of metabolic disorders, hypertension, cardiovascular disease, cancer, and overall mortality [2,3]. While weight loss is the gold standard for reversing/reducing these associated risks, it is often difficult for patients to achieve despite provider counseling. This is exemplified by the continued upward trajectory of US obesity rates, highlighting the current need to re-evaluate how best to treat patients. In the field of reproductive care, this is especially relevant as rates of severe obesity are higher in women compared with men, and almost one third of US women are considered to have obesity pre-pregnancy [4]. The impact of obesity on reproduction and fertility is both complex and controversial. With regard to access to care, many fertility practices have a BMI cutoff for utilization of any fertility treatment, including in vitro fertilization (IVF) [5,6]. Citing evidence of adverse pregnancy outcomes and a poor response to fertility treatments in individuals diagnosed with obesity, proponents argue that this is primarily a safety concern, specifically with respect to oocyte retrieval and subsequent risks during pregnancy [6,7]. Opponents argue that such cutoffs are harmful to the overall goal of fertility treatment; delayed treatment until weight loss, if possible, can decrease odds of conception due to increasing age [8,9].

Prior ethical discussions regarding access to fertility treatment based on weight utilize a theoretical framework [8]. While helpful in the delivery of care to individuals, this framework—with the core principals of justice, autonomy, beneficence/nonmaleficence—has little regard for one’s relation to social structure. As such, it lacks an intersectional
analysis of how weight and body size came to be made salient in reproduction, and its implications for treatment [10]. Here, we utilize a reproductive justice framework to understand the connection between fertility and body size/weight, as well as explore disparities in obesity and fertility [11]. In doing so, we argue that broadly applied BMI cutoffs are not clearly medically justifiable, and they may contribute to a wider culture of bias that marginalizes individuals with larger bodies.

2. Historical Perspective: Obese According to Whom?

Prior to consideration of obesity as an illness, it is important to recognize that public discourse on the obesity epidemic is often both racialized and gendered. Notably, racial and gender disparities are apparent in the prevalence of obesity. Between 2017 and 2018, non-Hispanic Black and Hispanic adults had the highest prevalence of obesity compared with all other race and non-Hispanic-origin groups [1]. Additionally, while pre-pregnancy obesity rates have steadily risen for all racial groups between 2016 and 2019, it remains highest for these two racial/ethnic categories [4]. This pattern is often emphasized by political and media figures who commonly reference the disproportionate prevalence of obesity among Black and Latino people, especially with respect to women and children [12].

In Western contexts, larger bodies are subject to intense surveillance, with female bodies in particular bearing the brunt of scrutiny. Women in general are much more likely to be considered as having obesity by their physicians, even if they do not have anthropometric measurements that constitute such a diagnosis [13]. Media and scientific reports on obesity also commonly focus on women [14]. It is clear that weight stigma is extremely prevalent and problematic throughout Western contexts, and it has been linked to shame, poor health outcomes, and self-blame [15,16].

From a historical and sociological perspective, anti-fat bias is tied to the development of a gender and a racial hierarchy. One hypothesis links the slender ideal and fat phobia in the United States with the transatlantic slave trade and the spread of Protestantism. At that time, a shift occurred such that increased body weight—once considered aesthetically preferable, healthier, and a sign of national pride—became associated with undesirable Blackness, greed, and ungodliness [10]. As such, fat phobia and the desire for slimness developed as social distinctions to craft and legitimate hierarchies based on race, sex, and class, rather than principally being concerned with health [10,17,18]. Ultimately, increased body weight became evidence of a low-class standing [10].

Medicine is a key institution in propagating these hierarchies. In Birth of the Clinic, Michel Foucault outlines what he terms the “biopolitics” of health—disciplinary guidelines such as what to eat and how much—that one must perform in order to be considered “healthy” and thus a “good citizen”, constituting a form of social control [19]. With respect to body size, increased body weight becomes medicalized as obesity, and guidelines were enacted to distinguish so called “healthy” from “unhealthy” body sizes and shapes.

Consider the definition of obesity. The Centers for Disease Control and Prevention defines obesity as abnormal or excessive fat accumulation that presents a risk to health [20]. A diagnosis of obesity is based on the body mass index (BMI), an estimate of the amount and the distribution of body fat based on height and weight. The formula for BMI was developed in the early 19th century by Belgian Scientist Lambert Adolphe Jacques Quetelet to demonstrate obesity across populations [21]. Developed during a period of Belgian history marked by sedentary lifestyles, BMI inherently assumes a low muscle mass and “excess” weight is primarily assumed to be comprised of fat. Factors such as gender, waist size, relative proportions of muscle mass, bone density, and body fat are not taken into consideration. Additionally, it is derived from data obtained on a predominantly Anglo-Saxon population, thus limiting generalizability.

Despite these limitations, the World Health Organization adopted the BMI scale as an official classification in 1995, and it has since become the standard metric for categorizing patients by weight [22]. In doing so, standards of body fat and weight distribution relative
to height became based on a metric developed relative to European bodies at a population level.

3. Contemporary Factors Contributing to Obesity

This historical context places several important limitations on contemporary evaluation of the effect of obesity on fertility. To begin, racial disparities in obesity prevalence have been documented as early as age 2 [23]. Furthermore, studies have shown that measures of structural racism such as housing, educational attainment, employment, health care, and criminal justice are associated with higher BMI among Black people and a lower BMI among White people [24]. While systemic racism does not account for obesity as a whole, given its endemic nature in the US, we must acknowledge its contribution to disparities in obesity and its treatment [25]. Thus, it may be difficult to disentangle the effects of structural racism in any studies of obesity and fertility.

As previously mentioned, women from communities that have been historically marginalized and women of lower SES have the highest rates of obesity compared with other demographics in the United States [25]. In 2018 alone, Black women in the United States were more than 50% more likely to meet criteria for obesity compared to White women [26]. Furthermore, rates of severe (class 3) obesity are significantly higher among Black women (16.8%) than White women (9.7%) [27]. And even then, Black patients are less likely to be diagnosed with obesity than White patients [28], often resulting in inadequate treatment and access to resources.

Socioeconomic status also has a strong effect. It is well understood that the ability to lead a “healthy” lifestyle is influenced by access to “healthy” foods, safety, social support, and green spaces for exercise and recreation. Accordingly, several studies have shown an association between neighborhood quality and BMI. One study in particular by Do et al., showed that neighborhood segregation and the concentration of disadvantage has a significant association with BMI, and it partially explains ethnic differences in its measurements [29]. Another study by Ludwig et al., showed that there was a lower prevalence of BMI > 35 kg/m$^2$ among those randomized to receive a housing voucher to live in a low-poverty census tract along with counseling on moving [30].

4. Obesity and Fertility: Where the Literature Currently Stands

Given the complex interplay of these biopsychosocial factors, it is unsurprising that fertility can also be impacted to various degrees in the setting of obesity. This has been largely attributed to changes in ovulation, oocyte quality, and endometrial receptivity [31]. Irregular menstrual cycles and ovulatory dysfunction are common in those with obesity [32,33], though this can be confounded by polycystic ovarian syndrome (PCOS), which is itself associated with obesity [34,35]. Even in those with regular menstrual cycles, differences in reproductive hormones have been observed with differences in BMI [36,37]. However, these measures may not sufficiently capture individual risk, as fat distribution may be more predictive of ovulatory dysfunction rather than total body fat, further emphasizing the limitations of BMI measurements [38,39].

Obesity has also been associated with an overall increased risk of pregnancy loss more often [40–44] than not [45–47]. However, it is unclear to what extent weight-related comorbidities contribute to this outcome. Even so, it has been established that relative risk of pregnancy complications is increased even in those without other documented chronic disease in addition to obesity [48,49].

Despite these findings, outcomes following IVF in patients with obesity are not clear cut. Obesity has been associated with impaired ovarian responsiveness to infertility treatments and a reduced quality of resultant oocytes. Numerous studies have shown an increased requirement for gonadotropins, an increased frequency of cycle cancellation, and a reduced number and size of oocytes [40,50–52]. While oocytes from those who are diagnosed as being overweight or obese also tend to have decreased blastulation rates [53–55], overall fertilization ratios are not consistently altered [55–59]. Although large scale retro-
spective studies based on national IVF data demonstrate a decrease in pregnancy rates and live birth rates with increasing BMI in autologous [60,61] and donor-derived transfers [60], a meta-analysis did not yield the same result.

New evidence is also emerging that contradicts previous research regarding the impact of obesity on IVF outcomes. A recent large prospective cohort study including 1889 participants and employing bioelectric impedance (BIA) as a proxy for body composition found that individuals with high levels of adiposity (40–44%) did not have significantly poorer embryological outcomes, implantation rates, or miscarriage rates when undergoing IVF. Interestingly, BMI categories yielded similar results. Though there was an increased risk of low birth weights, the authors suggest that IVF may in fact circumvent some of the negative impacts of obesity on fertility [62]. This shift in outcomes may be related to the increasing use of frozen embryo transfers (versus fresh), which earlier studies have also shown to not be significantly impacted by BMI [63]. So it seems that with advancements in assisted reproductive technologies, body weight may not present as significant an impediment as previously thought.

Weight loss among those with a diagnosis of obesity has had mixed results with respect to fertility as well. For example, bariatric surgery is known to provide significant and sustained weight loss [64]. However, there is limited data evaluating the effect of bariatric surgery on fertility or obstetric outcomes despite the majority of surgical patients being women of reproductive age. Existing studies provide conflicting results of the impact of bariatric surgery in individuals who have previously failed IVF in terms of retrieval success, embryo quality, and live births [65,66]. Similarly, recent randomized control trials of nonsurgical weight loss interventions have not shown improvements in birth rate [67–69]. It is also unclear what effect bariatric surgery has on pregnancy complications, as some studies have resulted in a decreased risk of gestational diabetes, hypertensive disorders, and macrosomia [70,71], whereas others actually show an increase in the rate of SGA and preterm births [72–74]. Thus, prior assumptions that weight loss interventions would translate to improved reproductive outcomes are now being challenged.

It is also worth noting that individuals wishing to undergo weight loss interventions such as bariatric surgery face strict criteria and extensive evaluations to qualify, some of which have been shown to not be clinically necessary and often add months to wait times or deter patients altogether. These limitations are largely driven by insurers, and they have been found to impact non-White patients and those receiving Medicaid disproportionately [75]. For those wishing to become pregnant following bariatric surgery, it is recommended to then delay an additional 1–2 years post-op due to ongoing weight loss and potential nutritional deficiencies [76,77]. Thus, undergoing bariatric surgery or other long term lifestyle weight loss interventions clearly prolongs time to pregnancy, a factor which may only compound struggles with fertility. In fact, age has been found to be a more significant factor than BMI contributing to a low birthrate in older populations [78], underscoring the need to weigh multiple aspects of overall health when considering fertility treatment options and timing.

5. Reproductive Justice and BMI Cutoffs; IVF as a Limited Resource

Reproductive justice advocates have long understood the need for an intersectional analysis of all influencing conditions. The relationship between obesity and reproductive care cannot be isolated from economic, environmental, and political justice, as well as LGBTQAI+, and disability rights. In this way, the experiences of people diagnosed with obesity mirror those of others who occupy similarly marginalized identity groups, including immigrants and those with psychiatric illness [79,80]. Indeed, restricted fertility care among patients who have obesity is just one example of inequity in access to care among a stigmatized and/or vulnerable population.

This restriction in access to care varies both by national and international location. For example, in New Zealand and Australia, a BMI over 35 kg/m² is considered an absolute contraindication to IVF and publicly funded IVF is limited to those with a BMI
less than 32 kg/m² [81]. This is similar to the UK where access to publicly funded IVF is limited to those with a BMI below 30–35 kg/m² [9]. It has been argued that when limited resources are available, those with the highest chance of success should receive treatment [9]. Optimization of success is an important consideration when distributing limited public funding. In the US, however, IVF is not publicly funded, and insurance benefits vary both by state and by individual insurance policy. As of 2021, only 19 states in the US required some form of insurance fertility benefits with 13 of those specifying IVF benefits [82]. Frequently, fertility care is an out-of-pocket expense for patients with the average cost for one cycle of IVF in the United States estimated at $12,400 [83]. There are similarly no formal BMI restrictions in place; however, 65% of surveyed clinics report they enforce BMI cutoffs ranging between 35–45 kg/m² [84].

One argument by proponents of BMI cutoffs raises concerns regarding the ability to deliver optimal care in the setting of obesity, particularly centered around limitations of transvaginal ultrasound and establishing or maintaining airways in the clinical setting [85]. However, studies demonstrate that oocyte retrieval among patients with obesity can be safely completed in the proper setting. The authors argue that in deliberating the treatment of patients with obesity, we must consider the individual in front of us and not simply the BMI number. If technical risks such as ovarian visualization with ultrasound and airway assessment are deemed safe in an individual, then they should not be denied care. As the rates of obesity continue to rise, an increasing number of patients will be unable to access fertility care with current rigid restrictions. Given the disproportionate rates of obesity among minority and lower socioeconomic populations, these groups will be most greatly impacted.

6. Conclusions

Effective solutions must consider the current state of the evidence—as described above, it is clear that high adiposity impacts fertility, and results in obstetrical and maternal risks; however, it is not clear how weight loss improves many of these outcomes. Ideally, primary preventative strategies aimed at reducing rates of obesity should be the gold standard, and they would circumvent the issues presented here. However, the reality faced by many individuals and healthcare providers at this time, and for the foreseeable future, indicates that we must meet patients where they are currently and intervene accordingly. Despite increased awareness, obesity rates continue to rise such that 29% of pre-pregnancy women in the US have obesity [4].

BMI cutoffs disproportionately impact minority populations and those of lower SES. As such, any guideline or restriction surrounding body size, especially with respect to fertility treatments, will disproportionately affect these populations. Employing a reproductive justice framework, we must therefore acknowledge this disparity, which may ultimately prevent the full realization of reproductive rights. While there are clearly obstetrical risks associated with increased maternal body weight, based on current evidence these should not automatically or statutorily preclude access to fertility healthcare. As was recently outlined in the American Society of Reproductive Medicine Committee Opinion, “on the basis of available evidence, there is no medical or ethical directive for adopting a society-wide BMI threshold for offering fertility treatment; rather there is considerable evidence arguing against such a policy” [31].

How then do we counsel and care for our patients in a way that is both socially-responsible and evidence-based? As others have proposed, it is time for a patient-centered approach. Rather than using strict BMI cutoffs, attention should be paid to the underlying etiologies of increased body weight, with a focus on overall health, risk-benefit ratios, clinical and safety capacity, and personal value assessment.

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