

# A Review on Misperception of Body Weight and Its Associated Factors in Reproductive Age Women

<sup>1</sup>Nabina Haku Duwal, <sup>2</sup>Zhang Wei, <sup>3</sup>Saran Limbu, <sup>4\*</sup>Chen Li

<sup>1</sup> School of Nursing, Jilin University, No. 965 Xinjiang Street, Changchun, 130021, Jilin, P.R. China

<sup>2</sup> School of Nursing, Jilin University, No. 965 Xinjiang Street, Changchun, 130021, Jilin, P.R. China

<sup>3</sup> Department of Orthopaedics, HDCS-Lamjung District Community Hospital, Besishahar, Lamjung, Nepal

<sup>4\*</sup> School of Nursing, Jilin University, No. 965 Xinjiang Street, Changchun, 130021, Jilin, P.R. China

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**Abstract:** The high number and growing prevalence of women who enter pregnancy overweight or obese are one of the most growing public health concern in this situation. The World Health Organization (WHO) reports obesity as an epidemic issue, with a higher prevalence in women than men. Thus, many pregnant women are seen with high body mass index (BMI). Obesity during pregnancy is considered a high-risk state because it is associated with many medical complications to mother and growing baby inside mother womb. Also, obese women have a higher incidence of infertility as compared with normal-weight women. Once they conceive, they have the higher rate of early miscarriage and congenital abnormalities. Misperception of body weight among women can have negative consequences, including body dissatisfaction leading to dieting, which is a strong risk factor for eating disorder. Women were normally more concerned about their body shape and weight than their counterpart men. Literature searches were conducted in three databases that cover a broad spectrum of disciplines: PubMed, Web of Science, and Elsevier Science with the date of the last search in February 2018. Given that my aim was to provide a critical summary of existing published work on the misperception of body weight and its associated factor in reproductive-age women.

**Keywords:** body mass index, body weight, misperception, Obesity, overweight, pregnancy, reproductive age women.

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## 1. INTRODUCTION

The prevalence of obesity is increasing worldwide which is one of the most important global health threats affecting both developed and developing countries<sup>[1]</sup>. Evidence supports that obesity is an important risk factor for numerous health problem including cardiovascular disease, diabetes mellitus, stroke, and cancer<sup>[2]</sup>. Due to obesity, there are destructive effects on psychological health such as depression, stress and some mental disease. Misperception of body weight has been defined as a discrepancy between an actual weight status by BMI (body mass index) and the perception of their own body weight, which may affect motivation to lose weight, especially among overweight and obese subject. Misperception of body weight was normally divided into underestimation and overestimation<sup>[3]</sup>. Underestimation is a term defined by considering oneself of a lower weight than they actually are and overestimation is a term considering oneself of being a higher weight than they actually are, and these are determined by BMI<sup>[4]</sup>. Both types of body weight misperception that is over and under assessing one's body size are destructive to women health<sup>[5]</sup>. Recent literature suggests that the underassessment of an individual's weight may subsidize to cut down motivations to lose weight and the belief that being overweight or obese is not a health hazard<sup>[6]</sup>. In contrast, overweight and obese women who over assess their weight status are at an increased risk to practice unhealthy dieting habits<sup>[6, 7]</sup>. There is increasing the number of women who misperceived their weight and which can cause negative outcomes for healthy weight<sup>[8]</sup>

Misperception of body weight has become common in the global world as it can lead to a variety of health problems in reproductive age women, especially during pregnancy. As weight perception is related to overweight and underweight<sup>[9]</sup>. Overweight and obesity has a negative consequence in a reproductive system such as menstrual disorder, infertility, poor pregnancy outcomes, miscarriage and fetal anomalies<sup>[10, 11]</sup>. In addition, many research suggests maternal obesity can increase the risk of childhood obesity<sup>[12]</sup>, cardiovascular disease and diabetes mellitus<sup>[13]</sup>. On the other end of the spectrum, underweight is well recognized to be associated with decreased fertility and adverse pregnancy complications such as preterm birth, low birth weight, small for gestational age, and neonatal death<sup>[14, 15]</sup>. Being underweight affects both sexes alike, however, the effects are more harmful to the women with consequences such as anemia, infertility or complications in pregnancy, threatening both maternal and fetal life.

### 1.1 Overweight and underweight:

Overweight is defined as a disproportionate fat accumulation in body weight which may have adverse consequences on health whereas underweight is a term describing a person whose body weight is considered too low to be healthy<sup>[2]</sup>. Body mass index (BMI) is an index of weight-for-height that is commonly used to categorize underweight, normal, overweight and obese in adults<sup>[2]</sup>.

According to WHO, "normal weight is defined as a BMI of 18.5–24.9 kg/m<sup>2</sup>, underweight as a BMI below 18.5 kg/m<sup>2</sup>, overweight as a BMI of 25–29.9 kg/m<sup>2</sup>, and obesity as a BMI of 30 kg/m<sup>2</sup> or greater. And obesity is further subcategorized into three classes that are class I (30–34.9 kg/m<sup>2</sup>), II (35–39.9 kg/m<sup>2</sup>), and III (40 kg/m<sup>2</sup> or higher)"<sup>[2]</sup>. Yet, there was a consideration about using the preferred BMI cut-off points for Asian populations due to the following views: high incidence of type 2 diabetes mellitus and cardiovascular risk factors in Asian populations even with a BMI lower than 25 kg/m<sup>2</sup>; difference of the relationship between BMI, percentage of body fats and body fat distribution in different populations. So, WHO proposed BMI cut-points 23.0 to 24.9 kg/m<sup>2</sup> for being overweight and  $\geq 25.0$  kg/m<sup>2</sup> for obesity in adult Asians<sup>[16]</sup>.

Overweight or obese may result in changes in hormone concentrations, adversely affecting reproductive health. Obesity can increase estrogen concentration and hence a risk of menstrual dysfunction, infertility and polycystic ovarian syndrome<sup>[17]</sup>. Both spontaneous rates of conception and outcomes following supported reproductive techniques are lesser among women of high BMI when compared with women of normal weight<sup>[18]</sup>.

### 1.2 Overweight, underweight and risk in pregnancy:

#### 1.2.1 Pregnancy weight gain guidelines:

In 2009, the Institute of Medicine (IOM) in the United States updated earlier guidelines on weight gain during pregnancy. The report set out specific ranges of weight gain for women with different pre pregnancy weights: suggesting that underweight women "(body mass index less than 18.5 kg/m<sup>2</sup>) gain 28 to 40 lbs (12.5 kg to 18 kg), normal weight women (BMI 18.5 kg/m<sup>2</sup> to 24.9 kg/m<sup>2</sup>) gain 25 to 35 lbs (11.5 kg to 16 kg), whereas overweight women (BMI 25 kg/m<sup>2</sup> to 29.9 kg/m<sup>2</sup>) were advised to gain between 15 and 25 lbs (7 to 11.5 kg) and obese women (BMI at least 30 kg/m<sup>2</sup>) to gain between 11 and 20 lbs (5 to 9 kg)"<sup>[19]</sup>.

#### 1.2.2 Overweight and risk in pregnancy:

It is well recognized from large studies in a number of countries that there is a strong link between obesity and adverse pregnancy outcome has been identified for the mother and her child<sup>[20]</sup>. Several studies suggest that maternal obesity and excessive gestational weight gain (EGWG) influence the 'initial years programming' and increases the risks of obstetric complications for both mother and children, increasing the risk of miscarriage and stillbirth, preterm birth, large for gestational age (LGA), congenital abnormalities, neonatal death, metabolic diseases, and childhood and adulthood obesity, gestational diabetes mellitus, gestational hypertension, pre-eclampsia, thromboembolism, post-partum haemorrhage, post-partum depression, post-partum weight retention, maternal death, a raised risk of requiring a Caesarean section and higher exposure to infection<sup>[18, 21]</sup>.

A large national study conducted in women from the United States, found the odds of developing gestational hypertension and pre-eclampsia were increased by 1.68 times for women who gained 1-19lbs over the guidelines, and were increased by 2.78 times for women who gained 20lbs or more over the guidelines, compared to women who gained within the

guidelines<sup>[22]</sup>. In a cohort study carried out among Danish women, the risk of GDM increased with bodyweight; compared to the normal-weight women, the adjusted odd ratio was 3.42 for overweight women, 7.54 for obese women and 10.83 for severely obese women<sup>[23]</sup>.

### 1.2.3 Underweight and risk in pregnancy:

At the other end of the spectrum, despite the current obesity epidemic, maternal underweight is also common in developing and underdeveloped countries<sup>[24]</sup>. Underweight in pregnancy is related to increased risk of pregnancy-related complications such as preterm delivery, low birth weight, antenatal anemia, birth asphyxia and increased perinatal mortality rates<sup>[25, 26]</sup>. A study in California where the underweight pregnancy was analyzed, found that 21.8% of underweight pregnancy experienced a recurrent preterm birth and recurrent preterm birth among underweight women was associated with younger age, short inter-pregnancy interval, and negative or no weight change between pregnancies<sup>[26]</sup>. A systematic review and meta-analyses also showed that underweight women had a higher risk of Preterm birth and low birth weight than those born to women with normal weight<sup>[25]</sup>. Malnutrition in pregnancy is also one of the risk factors for pregnancy-related mortality<sup>[27]</sup>. The report from Demographic and Health Survey of Bangladesh presented underweight women were 1.3 times more likely to have children with growth retardation and 1.6 times more likely to experience wasting compared to normal weight women<sup>[28]</sup>.

Pregnancy has been defined as a “learning period,” where women may be more interested in making healthy lifestyle changes for the sake of their baby. Therefore, Pregnancy is a great time for intervention, especially given women's regular and frequent contact with the healthcare personals<sup>[29]</sup>.

### 1.3 Perception of Weight:

Studies have shown that the perception of one's weight is important in the perception of health risks<sup>[30]</sup>. Some studies have found that overweight and obese women are more likely to misperceive their body size than normal weight individuals<sup>[5]</sup>, whereas some study showed that as BMI increases, overweight and obese individuals become more accurate in their perception of their body size<sup>[31]</sup>. These inconsistent results make it difficult to evaluate the true relationship between body weight misperception and Body mass index. Women who perceived themselves as overweight or obese were more likely to lose weight over time, whereas those women who perceived themselves as normal weight even though they were overweight or obese were more likely to gain weight<sup>[32]</sup>.

Numerous studies show that overweight and underweight misperception is a common problem around the world in the reproductive women<sup>[33]</sup>. A study found that almost 90% of obese women who were intending to become pregnant correctly perceived their weight, while <30% of overweight women who were intending to become pregnant correctly perceived their weight. This shows that overweight women intending to become pregnant were more likely to misperceive their weight than obese women intending to become pregnant<sup>[33]</sup>. Dorosty AR et al. found that many female employees working in the health centers in Tehran misperceived their body weight due to the preference for slimness. The misperception of weight status was more than 8 times higher in women with normal weight than overweight/obese subjects, which is possibly due to not satisfying on their body-weight status<sup>[34]</sup>. In the study of 775 pregnant women that measured if inaccurate perceptions of pre-pregnancy weight status were associated with excess weight gain found the risk of gaining excess gestational weight was 2.5 times higher in overweight and obese women who inaccurately described their pre-pregnancy BMI compared to overweight women who accurately described their pre-pregnancy BMI<sup>[35]</sup>. To decrease the growing number of obese/overweight people in the population, and to help them to maintain weight, it is important to first understand if there are problems with weight perception, as have been observed globally, and what factors affect this awareness of weight perception.

### 1.4 Factors associated with a misperception of body weight:

Many studies have revealed that there are many factors that contribute significant effect on weight misperception such as demographic factors, socio-cultural factors, health-related factors, psychological factor, etc. Among these factors, demographic factors are most represented factors and studies have put much more focus on the demographic factors than any other factor.

#### 1.4.1 Demographic Factors:

In our review studies, we found demographic factors such as age, gender, educational level, socio-economic status and marital status were the influential factors for weight misperception. We found that body weight misperception differs between different age groups, most of the studies reported older age is more likely to perceive their actual weight correctly and less likely to underestimate their weight. Young women tend much to overestimate their BMI<sup>[36]</sup>, as this age groups were more likely to describe themselves as ugly and fat than older aged women.

There was a significant difference in weight misperception among male and female respondents<sup>[31]</sup>. Most of the studies reported that men were more likely to take too lightly their weight than women whereas women were more likely to take to heavily their weight status than men<sup>[37]</sup>. Women were more likely to be thinner and to have more weight concerns than men. On the other hand, boys had higher scores for physical appearance and athletic competence than girls<sup>[31, 38-40]</sup>. This difference in weight perception between men and women might be due to the socio-cultural values of a slimmer body for women, which put much more burden on them to be more anxious about their beauty. Therefore, it is more likely that women will show more body concern than men. Further research, is therefore, required to discover how cultural norms and weight perception are related to gender.

Regarding educational level in our review, we found that lower educational level was more likely to underestimate their weight than those with higher educational level, the higher educational level was associated with higher body dissatisfaction and selection of slimmer body size in females<sup>[31, 41]</sup>. This different might be women from higher educational level have more access to physical activities as most of them may be from higher income level. Additionally, women from higher education might have more knowledge regarding the risk of obesity which can influence them to be more concerned about their body weight.

Another influential factor that we found from review literature is income level. Studies showed that higher income level is more likely to perceive their weight status correctly than those with lower income level. Women respondents with higher income level were more likely to perceive themselves as being overweight/obese than women with lower income level<sup>[4, 41]</sup>. This might be due to the fact that people with higher income level have more contact for different types of foods, physical activity facilities, social media and cosmetics. However, people with lower income level might associate larger body size with being wealthy and healthy.

Marital status is also another factor that influences in a misperception of body weight in women. Overweight/obese unmarried women were less to perceive themselves as being overweight/obese than married women. A study by Sunjoo Boo et al. found that Unmarried single women were 1.5 times more likely to place themselves in a heavier weight perception category compared to those who are married and living with a partner<sup>[31]</sup>. But, these were only reported in some studies more research is required to confirm whether these factors have an impact on weight perception or not.

#### 1.4.2 Socio-cultural factors:

Many of the reviewed studies have described that perception of weight was related to socio-cultural factors. Some African-Americans and Asian who were overweight/obese perceived due to their social and culture way of feeding and giving importance to care their family was the source of their weight gain<sup>[42]</sup>. Also, African-Americans women were more satisfied with their weight and feel more good-looking with their body than American white women, though they have larger body size than the whites. On the other hand, white women were more likely to be unhappy and feel less beautiful with their body and weight than black and other Asian females<sup>[43, 44]</sup>. Therefore, the role of cultural norms regarding body weight should be discovered intensely in future studies in order to implement them in health interventions.

Women who were satisfied with their body were more likely to misperceived their body weight than those who were dissatisfied with their weight<sup>[45]</sup>. Furthermore, body satisfaction was related to very good self-rated health status. This review also revealed that misperception of weight status was associated with lack of knowledge for ideal body weight<sup>[44]</sup>. It is important to note that if people do not have an idea regarding ideal body weight than they possibly either overestimate or underestimate their body weight.

#### 1.4.3 Health-Related Factor:

This review also revealed that weight misperception was influenced by health-related factor. Overweight and obese women who evaluated their health as very good were more likely to underestimate their weight than those who evaluated poorly. For those who have obese/overweight in their family members, they perceived that their weight gain was as a

consequence of family history and heredity<sup>[40]</sup>. As well, they were more likely to reflect their weight to be normal than women without overweight/obese family members. In addition, women having chronic disease were more likely to underestimate their body weight than those without disease<sup>[37, 44, 46]</sup>. This might be due to overweight and obesity was associated with chronic disease but it does not mean that it always exposes people to health risks. There are many other aspects that can cause diseases. Thus, we cannot generalize that they are always at risk, as for optimal health psychological well-beings also plays an important role. So, much more focus should be given in upcoming research on increasing the awareness of weight-related health hazards.

## 2. CONCLUSION

The increasing prevalence of misperception of body weight is globally pervasive. Studies of different population subgroups from numerous countries with varying rates of overweight or obesity have described misperceptions of their body weight. Determining the level of misperception of body weight is particularly very significant in reproductive women as Pre-pregnancy body weight can increase the risk for adverse pregnancy outcomes. In developing countries, women who are pregnant are facing the effect of potentially increasing obesity. Though studies in these places have assessed the levels of misperception across the region, there is insufficient regional evidence or for specific groups of people. It is significant to find susceptible groups to implement proper prevention programs. Weight-loss interventions might have limited effect if there is a scarcity of connection between perceived weight status and actual body weight.

This review concluded that the misperception of body weight is more common in reproductive women, many factors such as socio demographic factor, socio cultural factors and health related factors plays a significant role in influencing weight perception. Reproductive women are a very important population subgroup for directing given evidence that pre-pregnancy BMI is a strong interpreter of neonatal and child health outcomes. More misperception of body weight means less weight loss behaviour which can bring more complication during pregnancy so, all reproductive-aged women should be informed of these risks. Further researches are needed to recognize the different aspects of the high rate of misperception in reproductive age women and its associated factors.

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