

# Motherhood and Health of Young Indian Women: Prevalence of Obesity and Its Future Perspectives

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## ABSTRACT

**Background:** Future health of a nation is determined by the health of its young population. India is a young nation and hence its present health will decide the health of future generations. Similarly, the health of a mother decides the future health of the baby i.e. a fit mother will deliver a fit baby. Pregnancy period can be a crucial time to decide the health of the mother and the baby.

**Objectives:** To find the prevalence for overweight and obesity in women entering motherhood aged 18-32 years in Hisar city.

**Methods:** This paper presents secondary data from an ongoing clinical trial in pregnancy with 200 women entering motherhood. A questionnaire was used to record their socio-demographic data and types of obesity were measured using standard methods just before pregnancy.

**Results:** 35% of women were above the normal recommended ranges of BMI. The prevalence of overweight and obesity was 15% and 20% respectively in women just before entering motherhood. Also 37.5% of women were centrally obese which is directly associated with development of chronic lifestyle diseases in future. **Conclusion:** These figures show high prevalence of both general and central obesity among women of reproductive age. Young Indian women should be advised to maintain a healthy lifestyle to prevent development of obesity in them and its associated co morbidities in future generations, owing to a better health of the nation.

**Keywords:** Obesity, overweight, BMI, waist circumference, central obesity.

## INTRODUCTION

The recent economic transition and rapid urbanization has resulted in shift of traditional diets to more processed, refined and calorie rich diets therefore resulting in increased risk of development of various non communicable diseases in developing countries like India. <sup>[1]</sup> Currently, India is the third most obese nation in the world and a young nation. <sup>[2]</sup> By 2020, the average age in India will be, twenty-nine. <sup>[3]</sup> Women are reported to be more obese than men

especially for abdominal obesity. <sup>[4]</sup> The recent NFHS 4 in India reports, that one fifth of Indian women is overweight. <sup>[5]</sup> These statistics of obesity in a young nation can be a big health issue in future demanding a substantial amount of resources directed towards healthcare problems arising due to obesity related co-morbidities. Owing to a smaller frame of Asians they do not tend to look obese but when compared to their matched western counterparts they are more obese at a

similar BMI. [6] Indians also have a predisposition towards central obesity which is directly related to cardiovascular risks in future. [7] Various studies have shown the negative effects of excess pre pregnancy weight on delivery outcomes and also on future health of both mother and baby. [8-10] Haryana is one of the most prosperous states of North India and developing at a high pace. [11] This requires its young work force to be healthy and less predisposed to lifestyle diseases. This is even more required for expecting women as it concerns two individuals health as a whole. There is dearth of regional data when it comes to obesity parameters in young women of reproductive age group just before entering motherhood. Hence, a surveillance of their health status is crucial and required for estimating the accurate health of the future generations too. The present study provides the much lacking data of young women of reproductive age in the city of Hisar in Haryana.

## METHODOLOGY

This paper presents preliminary findings from an ongoing randomized controlled trial (RCT) registered by Clinical Trial Registry India vide no. CTRI/2017/04/008322. The subjects, confirmed pregnant women, were recruited from a maternity hospital which is in the panel of the Guru Jambheshwar University of science and Technology, Hisar. The whole protocol was approved by Institutional Ethical Committee vide letter no. PTY/2016/555.

The complete details about the study protocol and selection criteria are published elsewhere. [12] Briefly, inclusion criteria were pregnant women of >16 weeks gestation, having a singleton pregnancy, declared fit by the study gynecologist and having own mobile phone. The main exclusion criteria were complications in previous pregnancies, women who may shift location for delivery, extreme obesity defined by BMI greater than 30.0 Kg.m<sup>-2</sup>

and women having diabetes and other cardiovascular conditions before pregnancy.

The present study was carried out in the year 2016-17 over a period of 12 months. The sample consisted of 200 women, from Hisar city of Haryana state. The researchers collected required information for the study with the help of a structured questionnaire. Eligible women were measured for basic demographic variables and various obesity parameters i.e. height, weight, body mass index (BMI), waist circumference (WC), hip circumference (HC) and waist to hip ratio (WHR). Each participant filled a written consent form before the required measurements were taken. Table 1 shows the baseline characteristic of the participants. The measurement for waist and hip circumference were taken as per the guidelines in report of WHO expert consultation guidelines 2008, Geneva. [13]

### Methods of measurement:

**Height-** Height was measured with a non stretchable measuring tape to the nearest cm. Women were requested to stand upright without shoes with their back against the wall, heels together and eyes directed forward.

**Weight-** Pre pregnancy weight was self reported by women. Various studies have shown good validity of self-reported pre-pregnancy weight if collected early in pregnancy. [14-16]

**Waist circumference-** Waist circumference was measured using a non-stretchable measuring tape. Subjects were asked to stand erect in a relaxed position with both feet together on a flat surface; they wore light cloths and any unwanted bulky clothing was removed. They were asked to breathe normally. WC was measured as the smallest horizontal girth between the costal margins and the iliac crests at the end of expiration. Mean of two readings was taken as WC.

**Hip circumference-** Hip circumference was measured from around the widest portion of

the buttocks, with a non-stretchable measuring tape parallel to the floor.

**Body mass index** - BMI was calculated using the formula: weight (kg)/Height<sup>2</sup> (m<sup>2</sup>).

### Definitions

- **Overweight** was defined as a BMI  $\geq 23$  kg/m<sup>2</sup> but  $< 25$  kg/m<sup>2</sup> (based on the World Health Organization Asia Pacific Guidelines) with or without abdominal obesity (AO). [17]

- **Abdominal obesity** (AO) was defined as a waist circumference (WC)  $\geq 90$  cm for men and  $\geq 80$  cm for women. [18]

- **Isolated abdominal obesity** (IAO) was defined as a waist circumference of or  $\geq 80$  cm in women with a BMI  $< 25$  kg/m<sup>2</sup>.

### Statistical analysis:

Statistical analysis was performed using the SPSS version 21 software. Statistical formulas for mean and standard deviation were calculated. Continuous variables were expressed as mean  $\pm$  SD and categorical variables were expressed as number (%).

## RESULTS

The mean age of the study participants was 25.97 $\pm$ 3.50 years. Their average pre pregnancy weight and BMI was 56.29 $\pm$ 8.98Kg & 22.02 $\pm$ 3.30Kg/m<sup>2</sup> respectively. Their average WC and HC were 76.61 $\pm$ 7.02 cm & 91.48 $\pm$ 6.92 cm, while the WHR was 0.83 $\pm$ 0.04. Table 1 shows the initial readings of study participants at recruitment.

Table1. Pre pregnancy data of study participants at initial recruitment

Variable	Number (N)	Percent (%)
<b>Age</b>		
20-25	100	50%
26-30	77	38.5%
31-35	23	11.5%
<b>Pre BMI</b>		
<18.5Kg/m <sup>2</sup>	15	7.5%
18.5-22.9	115	57.5%
>23-25	30	15%
>25	40	20%
<b>Pre weight</b>		
<45	11	5.5%
45-65	161	80.5%
66-80	27	13.5%
>80	1	0.5%
<b>Waist circumference</b>		
<80cm	125	62.5%
>80cm	75	37.5%
<b>WHR</b>		
<80	42	21%
80-85	78	39%
>85	80	40%

Table2. Comparison of obesity parameters just before pregnancy and 2 months after delivery in women

Variable	Pre reading (200)	%	Post reading (140)	%	% change
<b>BMI (Kg/m<sup>2</sup>)</b>					
>23-25	30	15%	40	28.5%	13.5%
>25	40	20%	61	43.5%	23.5%
<b>WC(cm)</b>					
<80cm	125	62.5%	31	22.1%	40.4%
>80cm	75	37.5%	109	77.8%	40.3%
<b>WHR</b>					
<80	42	21%	6	4.2%	16.8%
80-85	78	39%	56	40%	1%
>85	80	40%	84	60%	20%
<b>PPWR(Kg)</b>					
<5	-	-	44	31.4%	-
5-10	-	-	72	51.4%	-
>10	-	-	24	17.1%	-

Of the total 200 women recruited, 140 were followed through pregnancy until 2 months post partum. They were measured at post partum for their gestational weight gain (GWG), BMI, WC, HC, WHC and post partum weight retention (PPWR) after delivery. Table 2 shows the obesity markers of study participants at 2 months post partum compared to initial recruitment

stage. There was 13.5% increase in overweight while 23.5% increase in obese women after pregnancy. As per WHO the optimum recommended WC for women is  $< 80$  cm (WHO). Before pregnancy 37.5% of women were already above the recommended range of WC ( $> 80$  cm) while this value reached up to more than double i.e. 77.8% after pregnancy i.e. an increase of

40.3% in central obesity. 31.4% and 51.4% of women retained less than five and between 5-10 Kg of weight post pregnancy, while 17.1% of women had retained >10 Kg of weight.

## DISCUSSION

The study was undertaken at Hisar city of Haryana state in India to see the prevalence of overweight and obesity in young women of reproductive age group of 20-35 years which was found to be 15% and 20% respectively. Few earlier studies have shown the prevalence of overweight and obesity in women across India with varying results. [19-21] A 2016 study done in north India showed prevalence for overweight and obesity in women to be 12.7% and 29.6% respectively. [19] While a study from south India showed it to be 27.7% and 19.8% respectively. [20] All these studies had a wider range of age distribution in the range of 20-60 years or even above, and unlike our study, did not specifically focused on young women of reproductive age group between 20-35 years. Since the present study had a narrow bracket of age range, the prevalence of overweight and obesity of 15% and 20% in this age group is a matter of concern. Since the study included nulliparous women, the following results indicate high prevalence of obesity in women entering motherhood, which itself is associated with weight gain. [22] Increasing age is reported to be associated with weight gain and its related co-morbidities. [23] With increasing age and subsequent pregnancies, women tend to gain weight, eventually increasing their chances for becoming more overweight or obese. [24] On follow up of 140 women till 2 months post delivery the prevalence of overweight and obesity had increased by 13.5% and 25.5% respectively. Obesity is growing at a very fast rate in India. The recent NFHS-4 reports India's obesity nearly doubled in 10 years. This trend has been reported for both men and women. Overweight puts an individual at risk of various lifestyle diseases like diabetes, hypertension, cancer etc and is

reported to be of a higher prevalence in south Asian region. [25] This becomes even more pronounced when it concerns women, as their health will decide the future health of a nation. Excess pre pregnancy weight could result in various delivery complications and development of obesity in both mother and the baby in the long run. Already India is the diabetic capital of the world, and the rate at which obesity epidemic is rising, it will result in rapid rise of other non communicable diseases too. Through this study, we have shown high prevalence of obesity in women entering motherhood in India. Hence, it becomes necessary to plan and implement healthcare services directed towards guiding and making young women aware of the harmful effects of excess weight before conception and during pregnancy.

## CONCLUSION

The prevalence of overweight and obesity are high in young Indian women about to enter motherhood. Young women should maintain a healthy lifestyle especially before conception to avoid development of maternal obesity and its associated co morbidities in future. This will also result in improving the overall health of the nation as it directly concerns two individuals i.e. the mother and the baby.

*Conflict of interest:* Nil

*Source of funding:* Nil

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How to cite this article: Pawalia A, Kulandaivelan S, Savant S et al. Motherhood and health of young Indian women: prevalence of obesity and its future perspectives. *Int J Health Sci Res.* 2018; 8(4):82-86.

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