

Maternal Perception on Obesity; Its Complications and Gestational Weight Gain in Pregnant Mothers Presenting to Antenatal Clinics in a South Asian Teaching Hospital (De Soyza Hospital for Women Colombo—DSHW)

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Abstract

The rates of overweight and obesity are rising to epidemic proportions globally, especially among women. Obesity is increasingly common in the obstetric population as well. Sri Lanka is not an exception to this regard. There is limited published data on maternal perceptions on obesity in pregnancy, gestational weight gain and its complications. The current study aimed to describe the maternal perception on obesity, their knowledge on complications of obesity in pregnancy and gestational weight gain in pregnant mothers. Hospital based descriptive cross sectional study was conducted among a systematic sample of 416 pregnant women registered for antenatal clinic care at De Soyza Maternity Hospital. Pre-tested interviewer administered questionnaire was used for data collection. Maternal BMI at booking visit was taken from the pregnancy record to assess the overweight/obesity prevalence among the study population. Nearly one third (32.2%) of the study population were overweight and 11.8% were obese. Fifty three percent (53%) of overweight women identified themselves as such, but 45% of them considered themselves to be normal weight. Most of the pregnant women in the study sample (59.6%) were unable to estimate the recommended weight gain in pregnancy. Women's knowledge on the specific risks associated with maternal obesity was poor. Pregnant mother's knowledge on obesity, gestational weight gain and its consequences were unsatisfactory. Bridging this knowledge gap is an important step towards improving perinatal outcomes for all pregnant mothers in the current obesity epidemic.

Keywords

Overweight, Obesity, Gestational Weight Gain, Maternal Complications, Medical Nutrition Therapy, South Asia

1. Introduction

World Health Organization (WHO) has recognized obesity as one of the most important public health problems facing the world today. The rates of overweight and obesity are rising to epidemic proportions, especially among women [1]. Overweight and Obesity are defined as a body mass index (BMI) of equal to or greater than 25 kg/m² and 30 kg/m² respectively. Sri Lanka is not an exception regarding overweight and obesity. A national survey conducted in 2012 found that 28.7% and 15.2% of women were overweight and obese respectively [2]. Obesity is increasingly common in the obstetric population as well. Global figures suggest there are more than 100 million obese women of child bearing age, with further 250 million who are overweight [1]. There is no specific data on obesity prevalence among Sri Lankan pregnant women.

There is a direct relationship between maternal overweight and increased risk of pregnancy complications [3]. Obese women are 3 times more likely to present with infertility compared with women of normal BMI, with the infertility rate increasing by 4% per BMI unit in obese women [1]. When they do conceive either naturally or through assisted techniques, there is an increased risk of miscarriage [3]. Ideally, BMI should be optimized preconception through diet and lifestyle counseling and specialized weight-reduction programmes. Obese mothers are at increased risk of getting fetal anomalies. Ultrasound examination is also difficult and less accurate due to poor visualization in obese mothers [3]. Maternal obesity and excessive gestational weight gain have well recognized associations with pre-eclampsia, gestational diabetes mellitus (GDM), instrumental or operative delivery, failed induction, prolonged labor, caesarian section, post partum hemorrhage, infections anesthetic complications and venous thromboembolism [3]. Maternal obesity is also associated with fetal macrosomia, increased perinatal morbidity and mortality, childhood obesity and diabetes [4].

The effect of maternal and social factors on gestational weight gain had also been studied. According to a cohort study done in Sri Lanka, being overweight, presence of maternal complications, passive smoking, low educational level and high income were the determinants of excessive weight gain during pregnancy [5].

Although the obesity, its complications and associated factors are well researched worldwide, there are limited published data on maternal perceptions on BMI in pregnancy, and the effect of this has on gestational weight gain and its complications. It has been demonstrated that overweight and obese pregnant women are less likely than women of normal weight to correctly assess their own BMI [6]. According to a study done in Australia, 47.8% of the study population was overweight or obese. Seventy four percent (74%) of obese women underes-

timates their BMI category. Sixty four percent (64%) of obese women and 40% of overweight women overestimated their recommended gestational weight gain. Women's knowledge on the complications of excess gestational weight gain and maternal obesity was also poor [7].

1.1. Justification

Sri Lanka has well developed and comprehensive antenatal and post natal care services; almost 100% pregnant mothers were registered for antenatal care [8]. Women received antenatal care from several places from filed clinic to specialized clinic to private sector. The average number of antenatal clinic visits varies from 15 to 22 visits [9]. Other than the clinic care, pregnant women received domiciliary care from the public health midwives at their door step. In addition to antenatal services government of Sri Lanka provide pre-conception care services at field level, where they assess the BMI of women and do necessary interventions. But women are less aware of these services and the coverage is also very low compared to antenatal care.

Weight gain in pregnancy remains a matter of great concern for women and health care provider. However, their concern on obesity and related issues are relatively low. Most Sri Lankan studies focus on inadequate maternal weight gain and its complications [10]. The information related to maternal perception on obesity is even scarce, though it is essential in terms of proper management of the current obesity epidemic. Bridging this knowledge gap will be an important step towards improving perinatal outcomes for all pregnant women, especially those who are overweight or obese at booking visit.

Therefore this study is aimed to describe maternal perception on obesity, its complications and gestational weight gain.

1.2. General Objective

To describe the maternal perception on obesity, their knowledge on complications of obesity in pregnancy and gestational weight gain in pregnant mothers attending antenatal clinics in the De Soyza Maternity Hospital—Colombo (DSHW).

1.3. Specific Objectives

- 1) To describe the maternal perception on obesity in pregnant mothers attending antenatal clinics in the De Soyza Maternity Hospital—Colombo (DSHW).
- 2) To describe the socio-demographic characteristics of the study sample.
- 3) To assess their knowledge on complications of obesity and gestational weight gain.

2. Methods

2.1. Study Design

Hospital based descriptive cross sectional study.

2.2. Study Population

All pregnant women registered for antenatal clinic care at De Soyza Maternity Hospital at the time of the study

Study period: 1st June 2017 to 31st August 2017.

2.3. Study Unit: Pregnant Women

Exclusion criteria: Pregnant women who are mentally retarded or physically handicapped were excluded from the study. Pregnant women with diabetes mellitus prior to pregnancy were also excluded.

2.4. Sample Size Calculation

The following formula is used to calculate sample size [11];

$$N = \frac{Z^2 P(1-P)}{d^2}$$

where,

N —Total sample size

Z —value corresponding to confidence limits

d —margin of error (Total width of confidence interval)

P —Expected population proportion

$P = 43.9\%$ (prevalence of overweight and obesity among Sri Lankan women, [12])

$Z = 1.96$ (Critical value for 95% confidence interval)

$d = 0.05$ (Accepted amount of absolute error is considered as 5%)

$$N = \frac{1.962 \times 0.439(1-0.439)}{(0.05)^2}$$

$$N = \frac{3.8416 \times 0.2462}{0.0025}$$

$N = 378$ to compensate for non respondents, 10% of the calculated sample size is added making total sample size as 416.

2.5. Sampling Technique

De Soyza Maternity Hospital is a tertiary care hospital for women in Sri Lanka. The hospital has approximately 5000 deliveries per year with a wide mix of ethnicities represented. Required number of pregnant women was recruited using a systematic sampling method. Every third mother registered for the antenatal clinic care in a particular clinic day was recruited for the study until the final sample size was achieved.

2.6. Study Instruments

The data was collected using pre tested interviewer administered questionnaire which contained the following sections:

- Socio-demographic information.
- Past and present obstetric history.
- Questions to assess maternal perception on obesity.
- Questions to assess their knowledge on complications of obesity and gestational weight gain.

Maternal BMI at booking visit was taken from the pregnancy record to assess the overweight/obesity prevalence among the study population.

2.7. Data Collection

Data was collected by pre-intern medical officers. The purpose of the study was explained to the pregnant women and informed written consent was taken.

2.8. Data Analysis

Data entry and analysis was done by using the Statistical Package for Social Sciences (SPSS) version 21.0. Quantitative data were described using frequency distribution and mean values.

Qualitative data were presented using percentages.

2.9. Ethical Considerations

Ethical clearance was obtained from the Ethics Review Committee of the National Hospital of Sri Lanka. Information sheet containing a comprehensive description about the purpose of the study, its importance and benefits was given to each participant and they were given adequate time to read it and clarify any doubts regarding the study. If the participant agreed to answer the questions, informed written consent was taken prior to the interview.

3. Results

Description of the study sample

Age of the antenatal women in the study sample ranged from 19 to 43 years, with a mean age of 27 years (SD = 5.146) and most women (58 %) were aged between 25 to 34 years. Of the 416 participants 366 (88%) were Sinhalese, 19 (4.6%) were Tamils and 31 (7.5%) were Muslims.

All the antenatal mothers in the study population had gone to school. Among all 195 (47%) had studied up to G.C.E Ordinary level. Higher educational attainments such as a diploma, a degree or above had been achieved by 12%. But 291 (70%) were house wives. Out of the 30% who were employed, most (18%) were in clerical and related jobs.

According to the total family income as reported by the mothers, 312 (75%) were getting more than Rs. 10,000. But there were 75 (18%) with no permanent income.

Reproductive Health Characteristics of the study sample

Most of the antenatal women (58%) were in their first pregnancy. 56% have planned their pregnancy. When categorized the sample according to POA, 182

(43.8%) were in 3rd, 139 (33.4%) were in 2nd and 95 (22.8%) were in 1st trimester. Most of them (59%) had registered for antenatal care before 8 weeks of POA.

Body Mass Index of the study sample

When women were classified according to BMI, 193 (46.4%) were normal weight (BMI 18 - 24.9 kg/m²), 40 (9.6%) were classified as underweight (BMI < 18 kg/m²), 134 (32.2%) were overweight (BMI 25 - 29.9 kg/m²) and 49 (11.8%) were obese (BMI > 30 kg/m²).

Service utilization

In Sri Lanka pre-pregnancy screening facilities are available free of charge at MOH level for women in reproductive age group. But most of them are underutilized. Among the 416 participants only 78 (18.8%) had attended for pre-pregnancy screening, 312 (75%) had not attended, 26 (6.3%) didn't know there are such services.

Antenatal sessions are conducted at MOH level for the antenatal couples in order to educate them regarding pregnancy and postpartum period. Participation for these sessions were fairly high (64%), only 1% didn't know there are such programs.

Women's perception of their own weight

Women's perception of their own weight is presented in **Table 1**. The majority of underweight women (90%), normal weight women (73.5%) and obese women (67%) identified themselves as such, however one forth (23.8%) of normal weight women considered themselves as underweight. Fifty three percent (53%) of overweight women identified themselves as such, but 45% of them considered themselves to be normal weight. Overweight women were the most likely to underestimate their own BMI category.

Accuracy of estimation of recommended weight gain in pregnancy

Most of the pregnant women in the study sample (59.6%) were unable to estimate the recommended weight gain in pregnancy, whereas 17% were able to correctly estimate it.

Table 1. Accuracy of estimation of BMI by women in each category.

Actual BMI category	Perceived BMI category			
	Under wt. (82)	Normal wt. (214)	Over wt. (84)	Obese (36)
Under wt (BMI < 18 kg/m ²) (40)	36 (90%)	4 (10%)	0	0
Normal wt (BMI 18- 24.9 kg/m ²) (193)	46 (23.8%)	142 (73.5%)	5 (2.5%)	0
Over wt (BMI 25 -29.9 kg/m ²) (134)	0	60 (44.7%)	71 (53%)	3 (2%)
Obese (BMI > 30 kg/m ²) (49)	0	8 (16%)	8 (16%)	33 (67%)

Complications related to excessive gestational weight/obesity

Seventy three percent (73%, n = 142) of women believed that excess gestational weight gain or obesity would be associated with increased pregnancy complications, however 17% (n = 9) doesn't know anything about it and 10% (n = 4) believed it would not lead to complications.

Although 73% gave positive responses, their knowledge on specific nature of these risks were poor; 51% of women identified problems related to pregnancy induced hypertension, 55.5% identified gestational diabetes, 38% identified the need for caesarian delivery and backache, 46% suggested persistent obesity after delivery. Less than 10% of pregnant women suggested the need for instrumental delivery, delay in wound healing, preterm birth and breast feeding problems as being related to excessive weight gain or obesity during pregnancy (**Table 2**).

Fifty eight percent (58%) of women believed that there could be neonatal complications from excess gestational weight gain or obesity, however 27% doesn't know anything about it and 15% believed it would not lead to neonatal complications. Macrosomia and diabetes in later life were suggested by about 28% of the women (**Table 3**).

The Institute of Medicine (IOM) guidelines for weight gain in pregnancy formed the basis of "expert opinion" (**Table 4**).

Table 2. Pregnant women's knowledge on maternal complications related to excessive weight gain/obesity.

Specific complication	Yes	No	Don't know
Abortions	76 (18.3%)	47 (11.3%)	293 (70.4%)
Pregnancy Induced hypertension	212 (51%)	54 (13%)	150 (36.1%)
Gestational diabetes	231 (55.5%)	52 (12.5%)	133 (32%)
Need for caesarian delivery	157 (37.7%)	37 (8.9%)	222 (53.4%)
Need for instrumental delivery	18 (4.3%)	54 (13%)	344 (82.7%)
Delay in wound healing	18 (4.3%)	56 (13.5%)	342 (82.2%)
Preterm birth	39 (9.4%)	54 (13%)	323 (77.6%)
Breast feeding complications	32 (7.7%)	36 (8.7%)	348 (83.7%)
Backache	153 (36.8%)	50 (12%)	213 (51.2%)
Persistent obesity after delivery	190 (45.7%)	24 (5.8%)	202 (48.6%)

Table 3. Pregnant women's knowledge on neonatal complications related to excessive weight gain/obesity.

Specific complication	Yes	No	Don't know
Overweight babies (macrosomia)	116 (27.9%)	70 (16.8%)	230 (55.3%)
Birth trauma	96 (23.1%)	43 (10.3%)	277 (66.6%)
Congenital anomalies	14 (3.4%)	49 (11.8%)	353 (84.9%)
Neonatal hypoglycemia	29 (7%)	45 (10.8%)	342 (82.2%)
Perinatal mortality/still birth	40 (9.4%)	46 (11.3%)	330 (79.3%)
Childhood obesity	64 (15.4%)	76 (18.3%)	276 (66.3%)
Diabetes in later life	122 (29.3%)	41 (9.9%)	253 (60.8%)

Table 4. Women's beliefs about safe ways to manage weight gain in pregnancy.

Ways to manage weight gain	Expert opinion	No. (%) of participants answering correctly
Have less soft drink	Yes	290 (69.7%)
Skip meals	No	207 (49.8%)
Choose low fat milk and dairy products	Yes	239 (57.5%)
Eat less cakes and chocolate	Yes	258 (62%)
Avoid exercises	No	150 (36%)
Drink more fruit juice	No	55 (13.2%)
Eat plenty of fruit and vegetables	Yes	317 (76.2%)
Exercise three or more times each week	Yes	166 (39.9%)
Eat for two	No	132 (31.7%)
Eat less take away foods/fast foods	Yes	269 (64.7%)
Eat less fried foods	Yes	332 (79.8%)
Eat low carbohydrate diet	No	25 (6%)

4. Discussion

In our present study maternal perception on obesity; its complications and gestational weight gain in pregnant mothers.

Women's perception of their own weight

Nearly 90% of the underweight women perceive them to be underweight; further 73% of the normal weight perceives them to be normal of normal weight. Majority of the patient who are overweight perceive as normal. 44% of the overweight women perceive them as normal.

16% of the obese still felt them self as normal. Whereas 67% seems to have a accurate perception about their weight. Most of the pregnant women in the study sample (59.6%) were unable to estimate the recommended weight gain in pregnancy, whereas 17% were able to correctly estimate it. Alexis Shub *et al.* in his recent study found that the majority (86.6%) of normal weight women identified themselves as such, however nearly one in 10 considered they overweight. While around two-thirds of women accurately identified they were overweight, the remainder considered them to be normal weight. The majority of obese women considered themselves to be overweight and these women were the most likely to underestimate their own BMI category, with only 24% identifying themselves as very overweight. In our study nearly 60% of the obese perceive as normal need to be further evaluated.

Pregnant women's knowledge on maternal complications related to excessive weight gain/obesity

Seventy three percent (73%) of women believed that excess gestational weight gain or obesity would be associated with increased pregnancy complications; however 17% doesn't know anything about it and 10% believed it would not lead to complications. Alexis Shub *et al.* found Ninety-four per cent of women be-

lieved that excess GWG or obesity would be associated with increased pregnancy complications, but their knowledge of the specific nature of these risks was poor. It is apparent from our study 73% compare to 90% in western studies would be still favorable for a developing country.

Pregnant women's knowledge on neonatal complications related to excessive weight gain/obesity

Fifty eight percent (58%) of women believed that there could be neonatal complications from excess gestational weight gain or obesity, however 27% doesn't know anything about it and 15% believed it would not lead to neonatal complications. Macrosomia and diabetes in later life were suggested by about 28% of the women and this percentage is totally unsatisfactory as it reflexes poor knowledge of pregnant women about neonatal complications.

Women's beliefs about safe ways to manage weight gain in pregnancy

Although the women are aware about traditional methods, they seem to be poorly knowledgeable about carbohydrate restriction as an effective method of weight loss. This effect possibly originates from lack of dietitian advice (medical nutrition therapy) in our clinics.

5. Conclusion

Most of our mothers still do not have correct perception about their weight especially among the overweight group. Significant proportion of mothers is aware about the maternal complications due to maternal obesity. There is poor awareness about neonatal complications and effective weight reducing strategies.

6. Recommendations

Since our conclusions are mostly related to overweight and obese women, the correct measurement of weight, referral to a dietician as well as seeking advice on losing weight are highly recommended.

Furthermore, the employment of medical officers specialized in food and nutrition on a full time basis will allow patients to receive proper nutritional advice (medical nutritional therapy) to overcome obesity and under nutrition.

Such services should also be modified to provide target information to further educate the patients about obesity, maternal, neonatal complications as well as provide logical and practical advice to lose weight with an effective follow-up.

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that all authors of this research paper have directly participated in the planning, execution or analysis of this study; all authors of this paper have read and approved the final version submitted.

Conflicts of Interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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