Knowledge and Perception of Pregnant Women regarding Excess Maternal Weight, Gestational Weight Gain and their Impact on Foetomaternal Outcomes: A Cross-sectional Study

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ABSTRACT

Introduction: Well recognised associations exist between maternal obesity, Gestational Weight Gain (GWG) and adverse health outcomes for mothers and their babies. Studies regarding women's knowledge of the risks of excess maternal weight and GWG are limited in both the populations assessed and also in their description of knowledge.

Aim: To examine women's perception of their own weight in pregnancy and to assess pregnant women's knowledge of complications of obesity and excess GWG and ways to manage the appropriate GWG.

Materials and Methods: A total of 216 pregnant women were recruited in this cross-sectional study from the antenatal clinic of Jawaharlal Nehru Medical College and Hospital, Aligarh, Uttar Pradesh, India between May and June 2018. Data was collected using an interviewer administered prestructured and pretested questionnaire. Statistical analyses were performed using Statistical Package for the Social Sciences (SPSS) version 20.0.

Results: Mean age of study population was 25.02±4.6 years. Mean Body Mass Index (BMI) was 24.55±4.07 kg/m². Frequent misclassification of their own BMI and inappropriate estimation of GWG by pregnant women was found in the present study. Overweight and obese women were more prone to inaccurate self-classification as 68.7% of overweight women and 62.5% of obese women underestimated their weight. Women had optimum knowledge for complications of obesity (69.4%) to mothers but knowledge is poor regarding complications to babies (45.5%). Also, awareness is significantly lower in obese women as compared to normal weight women p<0.05.

Conclusion: Notable deficiencies in the knowledge and perception of pregnant women regarding their weight, obesity, GWG and their impact on foetomaternal outcomes were found in the present study. Bridging this knowledge gap would be an important step towards improving short and long-term adverse maternal and perinatal outcomes.

INTRODUCTION

Overweight and obesity are widespread in almost every population in the world and is increasing exponentially in the developing countries too [1,2]. India is going through a double trouble of persistent problem of undernutrition alongside escalating rise in overweight and obesity [3]. Pregnancy is one of the most important phase of a woman's life and is suggested as the major event which could lead to excess weight gain and hence obesity. The rise in obesity during pregnancy is synonymous with the rising trend of obesity in the general population [4,5].

Studies have shown well-recognised associations of obesity, excess GWG or its retention after delivery with adverse foetomaternal and perinatal outcomes including pre-eclampsia, Gestational Diabetes Mellitus (GDM), instrumental or operative delivery, failed induction, foetal macrosomia, neonatal hypoglycaemia and perinatal mortality [6,7]. Besides, they could have deleterious effects on long-term health of both mothers and their child as foetal exposure to maternal obesity and excessive GWG can increase their risk of childhood obesity and chronic diseases later in life [8]. Thus from public health perspective, obesity and GWG are considered to be a modifiable risk factor not only for adverse pregnancy outcomes but also for more serious long-term health problems.

Knowledge lonesome is not sufficient to modify behaviours and bring about positive consequences, but is considered to be an indispensable prerequisite [9,10]. Studies and meta-analysis designed at improving perinatal outcomes through dietary and lifestyle modifications, also found pregnant women's knowledge and views to be a significant predictor of outcome measures [11,12]. Research considering pregnant women's knowledge regarding the risks of maternal weight and obesity in pregnancy is an area of investigation that has only recently begun to emerge. The limited available international literature suggests that pregnant women have limited knowledge of the risks of obesity and inappropriate GWG and their impact on perinatal outcomes [13-15].

Majority of work in this field is from developed countries. Owing to marked sociocultural variations between Asian and Western populations, differences in the knowledge, perceptions and experiences of overweight and obese women during pregnancy are expected in Asian communities. India is an Asian country that is multiethnic, multicultural and multilingual. Given this cultural diversity in the population, health belief models and attitudes toward health among women in this country are likely to differ.

Considering this, the present study was planned with the following objectives: 1) to examine pregnant women's perception of their own weight and healthy GWG in pregnancy; 2) to assess pregnant women's knowledge of complications of obesity and excess GWG and 3) to investigate association between BMI of pregnant women and risk perception for complications of obesity and excess GWG in pregnancy.

MATERIALS AND METHODS

In this cross-sectional study, 216 pregnant women from antenatal clinic waiting rooms of a university affiliated, tertiary medical facility between May and June 2018 were recruited. The hospital has approximately

7000 deliveries per year and caters to patients from surrounding rural and urban areas with wide mix of socio-demographics. The study was approved by Institutional Ethical Committee (213/FM). The purpose of the study was clearly explained to the participants, and informed consent was obtained from each study participant. All the participants who came during the stated period of time following the inclusion and exclusion criteria were included.

Inclusion criteria: Pregnant women of Indian origin, 18 and <40 years of age with confirmed intrauterine pregnancy and are willing to comply with the protocol of the study and have signed the Informed Consent Form (ICF) were included.

Exclusion criteria: Pregnant women with no record of first-trimester weight, multiple gestations, pre-existing diabetes or Polycystic Ovarian Syndrome (PCOS) were excluded.

Study Procedure

A systematic random sampling technique was applied to select potential participants using their Ante Natal Care (ANC) registration number. During the study period of two months, considering a daily attendance of about 150 patients in antenatal clinic and 50 working days, total sampling frame consisted of about 7500 pregnant mothers. Dividing by required sample size, k was calculated as 36. Considering that some females were excluded based on exclusion criteria, every 30th pregnant female on registration list were invited for interview. In cases a respondent was not eligible, the immediate next respondent was considered. This was continued until the final sample size was reached. [Table/Fig-1] shows the recruitment of study subjects. A final sample of 180 subjects was assessed.
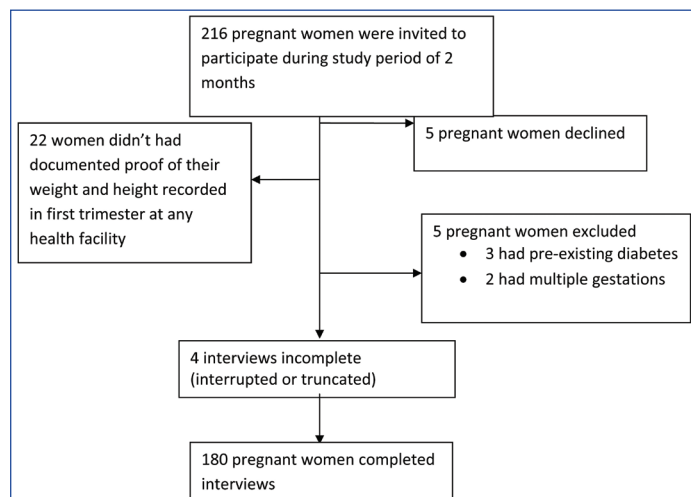
[Table/Fig-1]: Recruitment flowchart of study participants.

Data collection instrument and process: Data collection was done using a prestructured and pretested questionnaire, developed by adapting from previous similar studies and reviewing literature [14,16-18]. The questionnaire had two sections A and B. Section A dealt mainly with the socio-demographic data of the participants and included questions on women's age, education, occupation, socioeconomic status (as per Modified BG Prasad Socio-economic scale [19]), gestational age and clinical history. Section B had questions appropriate to the purpose of this study and was based to meet study objectives like women were asked to identify themselves as being underweight, normal weight, overweight or obese. They were asked what they think is the healthy weight gain for themselves. They were then asked if they believe that being overweight/obesity or having excess GWG can increase problems in pregnancy for the mother and baby. Women who had replied positively were then asked Likert-scaled questions regarding the risk of having specific problems associated with excess maternal weight and GWG. Participants were also asked regarding their beliefs for dietary practices and physical activity as ways to manage GWG. Pre-pregnancy BMI was calculated with first trimester measured weight and height (noted from antenatal case records), based on Fattah C et al., recommendations who concluded that maternal mean weight and body composition stayed practically constant in the first trimester and BMI was categorised as per World Health Organisation (WHO) classification [20].

Data quality management: The questionnaire was administered to all subjects by a single investigator (a final year medical student) to avoid inter-observer variations. Data was cross-checked by other investigators. A pretest was done on 5% of the required sample in a similar setting. Questions which posed difficulty and became unclear were rephrased and corrected, and unnecessary questions were excluded after pretest.

STATISTICAL ANALYSIS

The data from the questionnaire was checked manually for completeness, coded, entered in MS excel sheet, then cleaned and exported to Statistical Package for Social Sciences (SPSS) version 20.0 for analysis. Descriptive statistics was presented in percentages and mean±SD for categorical and continuous data, respectively. Chi-square test was applied to study association between categorical variables. The $p<0.05$ was considered as significant.

RESULTS

Socio-demographic and clinical characteristics: Mean age of study population was 25.02±4.6 years. Majority belonged to urban areas. Mean gestational age was 26.5±8.1 weeks. Mean BMI was 24.55±4.07 kg/m²; 58.3% were normal weight, 26.7% were overweight and 13.3% were obese [Table/Fig-2].

| Variable		n (%)
Age group (years)	15-20	24 (13.3)
	21-25	102 (56.6)
	26-30	33 (18.3)
	31-35	09 (5.0)
	>35	12 (6.6)
Residence	Urban	150 (83.3)
	Rural	30 (16.7)
Occupation	Housework	165 (91.6)
	Working	15 (8.4)
Literacy status	Illiterate	42 (23.3)
	Upto 5th class	39 (21.6)
	Upto high school	60 (33.3)
	More than high school	39 (21.6)
Parity	0	72 (40.0)
	1	60 (33.3)
	2	30 (16.7)
	3	9 (5.0)
	4 or more	9 (5.0)
Gestational age	1st Trimester	15 (8.3)
	2nd Trimester	72 (40.0)
	3rd Trimester	93 (51.7)
Body mass index (Kg/m²)	Underweight (<18.5)	3 (1.7)
	Normal weight (18.5-24.9)	105 (58.3)
	Overweight (25-29.9)	48 (26.7)
	Obese (≥30)	24 (13.3)
Socio-economic status	Upper class	87 (48.3)
	Upper middle class	36 (20)
	Middle class	39 (21.7)
	Lower middle class	12 (6.7)
	Lower class	6 (3.3)
	Total	180 (100)

[Table/Fig-2]: Socio-demographic and clinical characteristics of study participants (N=180).

BMI category and perception of own weight and healthy GWG: As compared to normal weight women, a significant percentage of overweight and obese women had misperception regarding their weight. Most of overweight women underestimated their weight, considered themselves to be underweight or normal weight [Table/Fig-3]. We also found that a significant percentage of women lacked the correct knowledge of appropriate GWG. Majority of overweight women didn't know about appropriate GWG and so were unable to estimate it at all. 62.5% obese women correctly estimated appropriate GWG but the ones who overestimated GWG also belonged largely to obese category [Table/Fig-4].
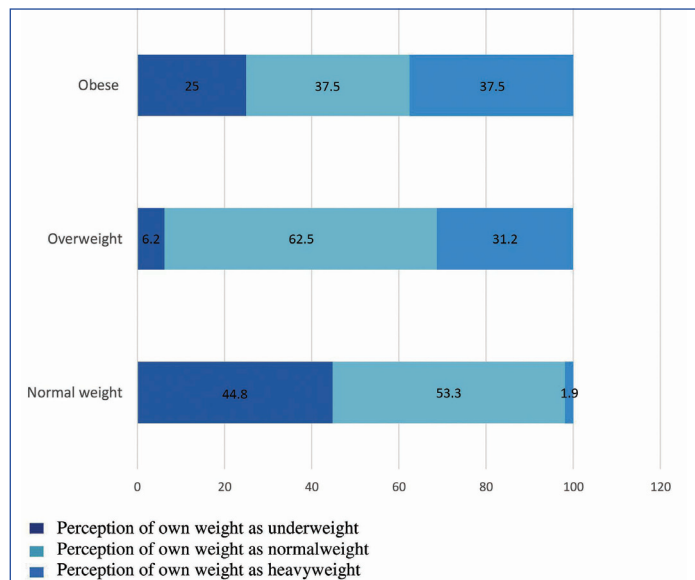
[Table/Fig-3]: Association between BMI category of participants and perception of own weight (n=177*).
*for calculation of perceptions according to BMI, three underweight women were excluded.
Pearson's Chi-square=46.844, df=4, p<0.05, significant
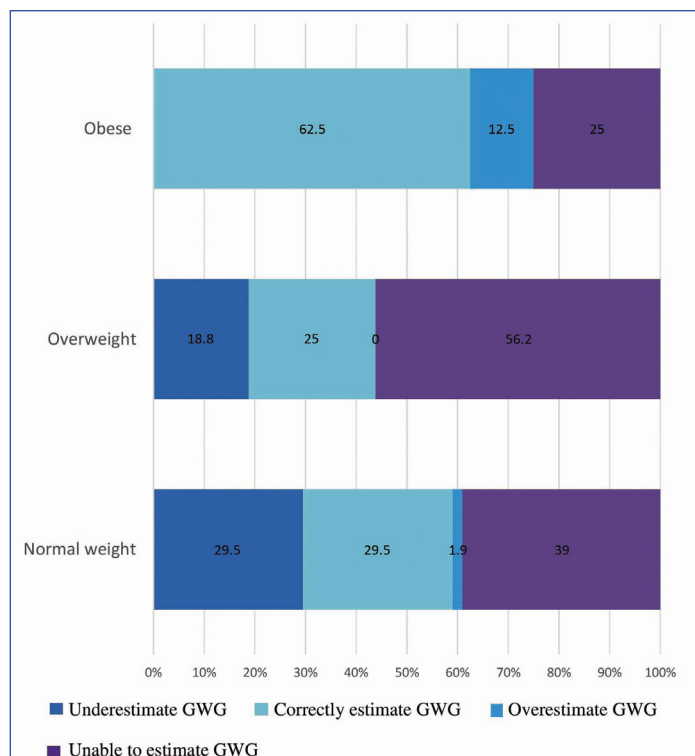
[Table/Fig-4]: Association between BMI category of participants and perception of healthy Gestational Weight Gain (GWG*) (n=177*).
for calculation of perceptions according to BMI, three underweight women were excluded.
Pearson's Chi-square=46.844, df=4, p<0.05, significant

BMI category and perception of risks due to excess maternal weight and GWG: Significant association between BMI category and knowledge of risks to mother due to excess weight, p<0.05 was found in the present study [Table/Fig-5].

Parameters	Yes n (%)	No n (%)	Don't know n (%)	Test of significance
Problems to mother				
Normal weight (n=105)	65 (61.9)	23 (21.9)	17 (16.2)	Chi-square=12.002, df=4, p=0.017
Overweight (n=48)	39 (81.3)	03 (6.3)	06 (12.5)	
Obese (n=24)	21 (87.5)	03 (12.5)	0	
Problems to baby				
Normal weight (n=105)	54 (51.4)	22 (21.0)	29 (27.6)	Chi-square=9.695, df=4, p=0.001
Overweight (n=48)	19 (39.6)	15 (31.3)	14 (29.2)	
Obese (n=24)	09 (37.5)	12 (50.0)	03 (12.5)	

[Table/Fig-5]: Association between BMI category and perception of pregnant females about problems to mother and baby due to excess maternal weight.
p<0.05, significant

When association between BMI category and knowledge of risks to mother due to excess GWG was sought, no significant association was found [Table/Fig-6].

Parameters	Yes n (%)	No n (%)	Don't know n (%)	Test of significance
Problems to mother				
Normal weight (n=105)	47 (44.8)	21 (20.0)	37 (35.2)	Chi-square=1.609, df=4, p=0.144
Overweight (n=48)	18 (37.5)	10 (20.8)	20 (41.7)	
Obese (n=24)	08 (33.3)	05 (20.3)	11 (45.8)	
Problems to baby				
Normal weight (n=105)	38 (36.2)	17 (16.2)	50 (47.6)	Chi-square=5.628, df=4, p=0.247
Overweight (n=48)	15 (31.3)	11 (22.9)	22 (45.8)	
Obese (n=24)	9 (37.5)	6 (25.0)	9 (37.5)	

[Table/Fig-6]: Association between BMI category and perception of pregnant females about problems to mother and baby due to excess Gestational Weight Gain (GWG).

Women's knowledge of specific adverse maternal and perinatal outcomes, owing to excess maternal weight: It was found that majority of women had correct knowledge for high risk of conditions like diabetes mellitus, hypertensive disorders, caesarean section and difficult vaginal delivery [Table/Fig-7]. Women's knowledge for risks to babies owing to maternal obesity was very poor. For majority of adverse outcomes, either women had no awareness at all or believed that there is low associated risk [Table/Fig-8]. Women's perception regarding safe and effective ways to manage GWG in pregnancy: It

Adverse maternal outcomes	Risks due to	Low risk n (%)	Avg risk n (%)	High risk n (%)	Don't know n (%)
Diabetes mellitus	Excess GWG	3 (1.7)	32 (17.8)	119 (66.1)	26 (14.4)
	Excess MW	3 (1.7)	22 (12.2)	128 (71.1)	27 (15.0)
Hypertensive disorders of pregnancy	Excess GWG	18 (10.0)	26 (14.4)	113 (62.8)	23 (12.8)
	Excess MW	9 (5.0)	19 (10.6)	131 (72.8)	21 (11.6)
Induction of labour	Excess GWG	18 (10.0)	41 (22.8)	65 (36.1)	56 (31.1)
	Excess MW	12 (6.7)	43 (23.9)	71 (39.4)	54 (30.0)
Difficult vaginal delivery	Excess GWG	21 (11.7)	29 (16.1)	119 (66.1)	11 (6.1)
	Excess MW	12 (6.7)	40 (22.2)	107 (59.4)	21 (11.7)
Caesarean section	Excess GWG	15 (8.3)	32 (17.8)	125 (69.4)	8 (4.4)
	Excess MW	15 (8.3)	25 (13.9)	125 (69.4)	15 (8.3)
Postpartum haemorrhage	Excess GWG	27 (15.0)	38 (21.1)	80 (44.4)	35 (19.4)
	Excess MW	12 (6.7)	30 (16.7)	96 (53.3)	42 (23.3)
Difficulty in breastfeeding	Excess GWG	66 (36.7)	41 (22.7)	23 (12.8)	50 (27.8)
	Excess MW	57 (31.7)	50 (27.8)	43 (23.9)	30 (16.7)
Postpartum weight retention	Excess GWG	33 (18.3)	44 (24.4)	83 (46.1)	20 (11.1)
	Excess MW	45 (25.0)	28 (15.6)	77 (42.8)	30 (16.7)

[Table/Fig-7]: Perception of risk of adverse maternal outcomes due to excess Gestational Weight Gain (GWG) and maternal weight.
*GWG: Gestational weight gain; MW: Maternal weight

was found that misconceptions regarding diet, physical activity and exercise are rampant among many pregnant women [Table/Fig-9].

Adverse perinatal outcomes	Risks due to	Low risk n (%)	Avg risk n (%)	High risk n (%)	Don't know n (%)
Macrosomia	Excess GWG	22 (12.2)	34 (18.9)	41 (22.8)	83 (46.1)
	Excess MW	73 (40.6)	37 (20.6)	35 (19.4)	35 (19.4)
Low birth weight	Excess GWG	67 (37.3)	49 (27.2)	2 (1.1)	62 (34.4)
	Excess MW	85 (47.2)	28 (15.6)	17 (9.4)	47 (26.1)
Prematurity	Excess GWG	43 (23.9)	25 (13.9)	38 (21.1)	74 (41.1)
	Excess MW	49 (27.2)	55 (30.6)	29 (16.1)	47 (26.1)
Congenital anomalies	Excess GWG	40 (22.2)	25 (13.9)	26 (14.4)	89 (49.4)
	Excess MW	70 (38.9)	34 (18.9)	17 (9.4)	59 (32.8)
NICU admission	Excess GWG	31 (17.2)	52 (28.9)	20 (11.1)	77 (42.8)
	Excess MW	58 (32.2)	34 (18.9)	26 (14.4)	62 (34.4)
Perinatal mortality	Excess GWG	34 (18.9)	34 (18.9)	32 (17.8)	80 (44.4)
	Excess MW	55 (30.6)	28 (15.6)	29 (16.1)	68 (37.8)
Childhood obesity	Excess GWG	58 (15.5)	37 (20.6)	26 (14.4)	89 (49.4)
	Excess MW	100 (55.6)	31 (17.0)	35 (19.4)	14 (7.8)

[Table/Fig-8]: Perception of risk of adverse perinatal outcomes due to excess Gestational Weight Gain (GWG) and Maternal Weight (MW).
GWG: Gestational weight gain; NICU: Neonatal intensive care unit

Parameters	Participants answering correctly N (%)
Nutritional advices	
Skip meals	127 (70.6)
Increase number of servings in a day	35 (19.4)
Decrease number of servings in a day	88 (48.9)
Have less fried food	149 (82.8)
Eat less dietary fibre	111 (61.7)
Eat less saturated fat	143 (79.4)
Eat more fruits and vegetables	164 (91.1)
Have more milk and dairy products	138 (76.7)
Have more fruit juices	30 (16.7)
Physical activity	
Avoid physical activity	151 (83.9)
Priority should be rest	148 (82.2)
Exercise will harm the baby	125 (69.4)
Household activities gives adequate physical exercise	84 (46.7)
Exercise 3 or more times a week	108 (60.0)
Engage in about 30 min of exercise every day	81 (45.0)
Any pregnant mother can perform exercises without the advices of healthcare professionals	120 (66.7)

[Table/Fig-9]: Knowledge and perceptions of pregnant women regarding safe and effective ways to manage Gestational Weight Gain (GWG).

DISCUSSION

Authors found frequent misclassification of one's own BMI and inappropriate estimation of GWG by pregnant women. Women in the present study underestimated their weight and overweight and obese pregnant women were more prone to inaccurate self-classification compared with normal weight women. The finding of inaccurate perception of body size is similar to those of Gaudet LM et al., and Callaway L et al., who reported that pregnant women tend to underestimate their BMI and underestimation of BMI was significantly more common in overweight and obese women [14,21]. There are several concerning aspects of the findings of the present study. The inaccurate categorisation of BMI indicates that the study participants may not realise how overweight or obese they are. Perception of true health risk related to body size is decreased in individuals who underestimate their weight [22]. This may lead

to a reduction in desire to both seek knowledge related to, and to participate in, healthy behaviours that reduce health risk [22]. Moreover, underestimation of weight may lead to excess GWG. Herring SJ et al., found that overweight and obese women who underestimated their weight had a four-fold increase in the likelihood of excess GWG compared with overweight and obese women who correctly assessed their weight [23].

The results of the present study indicates that large proportion of women didn't know about appropriate GWG. Majority of overweight women didn't know about healthy GWG and were unable to estimate appropriate GWG for their BMI. This finding of the present study is in accordance with many other studies in which women overweight or obese women were least accurate in estimating correct GWG [14,15,24]. Contrarily, large proportion of obese women in our study correctly estimated GWG for them. This might be due to the fact that greater percentage of obese women has correct perception of their weight, so more awareness. Also might be owing to their obesity they received more or retained more counselling by healthcare providers. It was found that although women are aware of risks to mothers due to excess maternal weight but, awareness is low regarding risks to babies. Regarding nature of risks to mothers, majority of women had optimum knowledge regarding common problems like diabetes, hypertension, caesarean section and postpartum haemorrhage but, for problems like difficulty in breast feeding and postpartum weight retention, they either don't know or have misconceptions. Similar to our study Kominiarek M et al., and Nitert MD et al., found that their study population have correct knowledge regarding adverse outcomes like diabetes, hypertension and caesarean section [13,25]. Gaudet LM et al., and Shub A et al., however, reported that there is poor knowledge about these adverse outcomes in their study groups [14,15].

Regarding adverse outcomes for babies, majority of women are either not aware of the risks or had misconceptions. Similar to our study, Kominiarek M et al., and Gaudet LM et al., also found that their study population had poor knowledge regarding risks to babies [13,14]. So, in our study although pregnant women were aware that excess maternal weight and GWG can have adverse effect on them but they are either unaware or had misconceptions for adverse effects on their babies. Given that a healthy baby is a highly valued outcome of pregnancy for most women [25,26]; increasing women's knowledge of the adverse effects of excess weight and GWG on babies, may be a powerful motivating factor for both weight loss prior to pregnancy and also for appropriate GWG.

The present study also characterised pregnant women's beliefs about appropriate physical activity and dietary approaches to achieve safe and effective management of weight gain in pregnancy, demonstrating that misconceptions regarding diet, physical activity and exercise are rampant among many pregnant women. Shub A et al., and Loh AZH et al., also found that their study participants were also found to hold many incorrect beliefs about safe weight management in pregnancy [15,27]. The results of the present study emphasise that prenatal healthcare providers should not assume that pregnant women are using safe and effective management strategies for appropriate GWG. Inaccurate beliefs and unsafe practices as ways to manage GWG contributes not only to the increasing frequency of excess GWG but, also results in increasing prevalence of associated adverse foetomaternal outcomes.

The present study has several strengths like besides assessing women's knowledge and perceptions regarding their weight, GWG and impact on maternal and perinatal outcomes association of maternal BMI with women's misconceptions were also studied. The authors used interview method, which increases participation compared with written surveys, especially for women who are reluctant to participate and are less confident in their written language abilities. A single researcher executed all the interviews, excluding interobserver variation. Participants were interviewed while they

were awaiting their turns in antenatal clinics; the findings thus, reveal women's present thoughts, and are free of the shortcomings of data collected both prospectively and retrospectively. The present study calls for further research in this field as this information is critical for developing strategies for education and for the prevention and management of excess maternal weight and GWG. Issues outside the scope of current study that needs to be focussed in future studies are: How much impact knowledge had on adverse outcomes and awareness of which risks and to whom, affects outcome more. Regarding imparting knowledge; at what time, of which type and by whom, so as to achieve best results also needs to be addressed.

Limitation(s)

Weakness of this study is the small sample size. Besides BMI, the influence of other socio-demographic traits and healthcare providers counselling, on women's knowledge and perceptions were not assesed. These are important determinants and might be independently associated with differences in risk perception for complications of obesity in pregnancy.

CONCLUSION(S)

To conclude, notable deficiencies in the knowledge of women regarding their weight were found, GWG and their impact on maternal and perinatal outcomes. Women underestimated their weight and overweight and obese pregnant women were more prone to inaccurate self-classification and misconceptions.Till recent past, we were facing the problems of undernutrition and underweight but due to the increasing prevalence of obesity in our population, proportion of women who are entering in pregnancy as obese is increasing. The burden of obesity related complications in pregnancy are thus likely to increase. There is a need to look into public health education measures and improve knowledge and practices of the population. Increasing women's knowledge of the risks of excess maternal weight and weight gain and educating them about safe and effective ways to manage, healthy GWG would be an important step towards improving short and long-term adverse maternal and perinatal outcomes. These health education strategies may in turn contribute in halting the self-perpetuating vicious cycle of increasing incidence and prevalence of non communicable diseases in the population.

REFERENCES

[1] Obesity: Preventing and managing then global epidemic. Report of a WHO consultation. World Health Organ Technical Report Series. 2000;894:01-253.
[2] Popkin BM, Adair LS, Ng SW. Global nutrition transition and the pandemic of obesity in developing countries. Nutrition Reviews. 2012;70:03-21.
[3] Wang Y, Chen HJ, Shaikh S, Mathur P. Is obesity becoming a public health problem in India? Examine the shift from under- To overnutrition problems over time. Obesity Reviews. 2009;10:456-74.
[4] Heslehurst N, Ells LJ, Simpson H, Batterham A, Wilkinson J, Summerbell CD. Trends in maternal obesity incidence rates, demographic predictors, and health inequalities in 36 821 women over a 15-year period. British Journal of Obstetrics and Gynaecology. 2007;114:187-94.
[5] Institute of Medicine/National Research Council (Committee to Reexamine IOM Pregnancy Weight Guidelines, Food and Nutrition Board and Board on Children, Youth and Families) 2009 Weight gain during pregnancy: Re-examining the guidelines. Washington, DC; National Academies Press.
[6] Rosenberg TJ, Garbers S, Chavkin W, Chiasson MA. Prepregnancy weight and adverse perinatal outcomes in an ethnically diverse population. Obstetrics and Gynecology. 2003;102:1022-27.
[7] Baeten JM, Bukusi EA, Lambe M. Pregnancy complications and outcomes among overweight and obese nulliparous women. American Journal of Public Health. 2001;91:436-40.
[8] Darnton-Hill I, Nishida C, James WPT. A life course approach to diet, nutrition and the prevention of chronic diseases. Public Health Nutrition. 2004;7:101-21.
[9] Bookari K, Yeatman H, Williamson M, Australian pregnant women's awareness of gestational weight gain and dietary guidelines: opportunity for action. Journal of Pregnancy. 2016;2016:8162645.
[10] Sapp SG. Incomplete knowledge and attitude-behavior inconsistency. Social Behavior and Personality. 2002;30:37-44.
[11] McPhie S, Skouteris H, Hill B, Hayden M. Understanding gestational weight gain: The role of weight-related expectations and knowledge. Australian and New Zealand Journal of Obstetrics and Gynaecology. 2015;55:21-26.
[12] Thangaratinam S, Rogozinska E, Jolly K, Glinkowski S, Roseboom T, Tomlinson JW, et al. Effects of interventions in pregnancy on maternal weight and obstetric outcomes: Meta-analysis of randomised evidence. British Medical Journal. 2012;344:e2088.
[13] Kominiarek M, Vonderhei S, Endres L. Maternal obesity: Do patients understand the risks? Journal of Perinatology. 2010;30:452-58.
[14] Gaudet LM, Gruslin A, Magee LA. Weight in pregnancy and its implications: What women report. Journal of Obstetrics and Gynaecology Canada. 2011;33:227-34.
[15] Shub A, Huning EY, Campbell KJ, McCarthy EA. Pregnant women's knowledge of weight, weight gain, complications of obesity and weight management strategies in pregnancy. BMC Research Notes. 2013;6:278.
[16] Okeh NO, Hawkins KC, Butler W, Younis A. Knowledge and perception of risks and complications of maternal obesity during pregnancy. Gynecol Obstet. 2015;5(9):01-05.
[17] Asefa F, Nemomsa D. Gestational weight gain and its associated factors in Harari Regional State: Institution based cross-sectional study, Eastern Ethiopia. Reprod Health. 2016;13(1):01-07.
[18] Kowal C, KukJ, Tamim H. Characteristics of weight gain in pregnancy among Canadian women. Maternal and Child Health Journal. 2012;16:668-76.
[19] Shaikh Z, Pathak R. Revised Kuppuswamy and B G Prasad socio-economic scales for 2016. Int J Community Med Public Health. 2017;4(4):997-99.
[20] Fattah C, Farah N, Barry SC, O'Connor N, Stuart B, Turner MJ. Maternal weight and body composition in the first trimester of pregnancy. Acta Obstetricia et Gynecologica. 2010;89:952-55.
[21] Callaway L., M. O'Callaghan, H. McIntyre. Barriers to addressing overweight and obesity before conception. Medical Journal of Australia. 2009;19:425-28.
[22] Post RE, Mainous AG 3rd, Gregorie SH, Knoll ME, Diaz VA, Saxena SK. The influence of physician acknowledgment of patients' weight status on patient perceptions of overweight and obesity in the United States. Archives of Internal Medicine. 2011;171:316-21.
[23] Herring SJ, Oken E, Haines J, Rich-Edwards JW, Rifas-Shiman SL, Kleinman ScD KP, et al. Misperceived pre-pregnancy body weight status predicts excessive gestational weight gain: Findings from a US cohort study. BMC Pregnancy Childbirth. 2008;8:54.
[24] Thompson MW, Nassar N, Robertson M, Shand AW. Pregnant women's knowledge of obesity and ideal weight gain in pregnancy, and health behaviours of pregnant women and their partners. Australian and New Zealand Journal of Obstetrics and Gynaecology. 2011;51(5):460-63.
[25] Nitert MD, Foxcroft KF, Lust K, Fagermo N, Lawlor DA, O'Callaghan M, et al. Overweight and obesity knowledge prior to pregnancy: A survey study. BMC Pregnancy and Childbirth. 2011;11:01-08.
[26] Hagger M, Orbell S. A meta-analytic review of the common-sense model of illness representations. Psychology and Health. 2003;18:141-84.
[27] Loh AZH, Oen KQX, Koo IJY, Ng YW, Yap JCH. Weight management during pregnancy: A qualitative thematic analysis on knowledge, perceptions and experiences of overweight and obese women in Singapore. Global Health Action. 2018;11:149919.

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AUTHOR DECLARATION:
• Financial or Other Competing Interests: None
• Was Ethics Committee Approval obtained for this study?   Yes
• Was informed consent obtained from the subjects involved in the study?   Yes
• For any images presented appropriate consent has been obtained from the subjects.   NA