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Pre-pregnancy body mass index, gestational weight gain and adverse birth outcomes: some evidence from Italy

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Key words: Pre-pregnancy BMI, gestational weight gains, adverse birth outcomes, Italy
Parole chiave: BMI pre-gravidico, guadagno di peso gestazionale, basso peso alla nascita, macrosomia fetale, parto pre-termine

Abstract

Background. *Overweight and obese women present an increased risk of poor maternal and child health outcomes. The aim of this paper is to analyze the joint effects of pre-pregnancy body mass index and inadequate gestational weight gain on birth weight and gestational age in an Italian sample of pregnant women.*
Methods. *Data were obtained from a sample of about 2,000 pregnant women at the University Teaching Hospital of Perugia University (Italy) in 2013. We used the revised classification proposed by Institute of Medicine to identify gestational weight gains considered as appropriate.*
Logistic regression models were used to estimate the adjusted odds-ratios of women belonging to any BMI class different from normal (used as the reference category) and of women who increased their weight by an amount smaller or greater than normal, controlling for a large set of observable confounders.
Results. *Higher probability of low birth weight was associated with both obesity (OR = 1.9124, s.e. = 0.526) and less than normal weight gains (OR = 2.3614, s.e. = 0.388). The probability of fetal macrosomia was found to be positively associated with more than normal weight increases (OR = 2.6232, s.e. = 0.465). Pre-term deliveries were associated with less than normal gestational weight gains (OR 1.7338, s.e. = 0.320).*
Conclusions. *Overweight and obesity represent a big issue for public health. In particular, weight management during pregnancy and pre-pregnancy could determine negative health outcomes in newborns. In our study we found that inadequate weight variations during pregnancy, according to the Classification of the Institute of Medicine, negatively influence health conditions at birth. Stronger initiatives, especially in terms of midwifery, nurse training and informative policies should be adopted by policy makers.*

Introduction

Improvements of maternal, fetal, neonatal and child health are key public health goals. Weight management in women could represent a strategic resource to reach this objective. Obesity is rapidly increasing worldwide both in high, low and middle-income countries. The World Health Organization (WHO) confirmed that in 2014, worldwide, 40% and 15% of adult women were overweight or obese, respectively (1).

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Following this pattern, obesity prevalence will surpass 21% in women by 2025 (2). In recent years, we have witnessed a sharp increase in maternal pre-pregnancy body mass index (BMI) among women in childbearing age, especially in developed countries (3). A review (4) confirmed this trend in the US population and reported increasing disparities according to gender, age, socioeconomic status and ethnic group.

In particular, overweight and obese women present increased risks of poor maternal and child health outcomes, revealing a positive correlation between pre-pregnancy BMI and infant birth weight (5). Pre-pregnancy BMI plays a major role as a determinant of infant birth weight, increasing also the probability of weighing more than 4,000 g at birth, irrespective of gestational age, e.g. fetal macrosomia (FM), or large for gestational age (LGA). The same result is generally found when the complex set of relationships between pre-pregnancy BMI, gestational weight gains, and other maternal factors are considered with respect to fetal growth (6). For all these reasons, pre-pregnancy BMI is considered so far one of the strongest predictors of adverse neonatal outcomes (7).

Recently, also gestational weight gains (GWGs) were found to be strongly associated with adverse outcomes at birth. These results became especially evident after the introduction of the guidelines for weight gains during pregnancy by the Institute of Medicine (IOM) in 2009 (8). IOM defined adequate GWGs in relation to pre-pregnancy BMIs of women, and imposed thresholds varying according to usual BMI classes of underweight, normalweight, overweight or obesity.

Even after the adoption of this new classification, a large percentage of pregnant women gained weight outside the recommended thresholds. Moreover, maternal pre-pregnancy overweight and obesity increased drastically, and approximately 50% of women who delivered in 2009 gained more weight than that recommended by the guidelines (9). These figures did not change significantly even during the period 2006-2012.

Several studies showed how excessively large GWGs were associated with increased risks of pregnancy-induced hypertension, gestational diabetes mellitus (GDM), caesarean delivery, LGA and FM (10-16). Underweight and excessively low maternal GWGs were indeed associated with increased risks of low birth weight (LBW), small for gestational age (SGA) and preterm delivery (PTD) (17-21), particularly in women with pre-pregnancy under - or normal weight (22-28).

However, only few studies estimated the joint association of maternal pre-pregnancy BMI and GWGs with pregnancy outcomes (7, 29) using the 2009 IOM guidelines (12, 30). Results from these studies did not reach a consensus on which factor prevails between pre-pregnancy BMI and inadequate GWGs in determining adverse neonatal outcomes. Heterogeneity of results depends crucially on the country analysed (4, 14) and on the variables included in empirical models (29). In this context, observable and unobservable confounders, which - if not accounted properly - may lead to misleading results, play a key role.

The aim of this paper is to analyse the joint effects of pre-pregnancy BMI and inadequate GWGs on birth weight and gestational age. To our knowledge, this is the first time that the IOM classification is applied to Italian data.

Methods

Data and statistical analysis

Data were collected from a survey conducted in the Local Health Units belonging to Region Umbria, located in Central Italy, with almost 1 million inhabitants and about 8,000 newborns per year. In Italy maternal and child healthcare is offered by the Italian National Health System (INHS), which provides universal coverage and free prenatal healthcare both at home and at point of delivery. The study was carried out in accordance with the Italian law on personal privacy (Art. 20-21, Legislative Decree 196/2003) and the regulations of the Umbria Regional Council about data management. A specific written, informed consent was obtained from all patients in order to receive more information than those routinely requested in the hospital. In 2013, 2,027 consecutive delivering women were interviewed at the Teaching Hospital of Perugia University, the largest public hospital in the Region, with the annual rate of women attending labour wards being nearly 2,030 (31). A questionnaire was drawn taking inspiration from existing literature and adapted to the context by the internal researchers (www.cdc.gov/nccdphp/dnpa/bmi). In the interviewer-administered questionnaires, the following items were included: (i) *mother's anthropomorphic characteristics* before and during pregnancy, self-reported (e.g., height, weight and weight variations), (ii) *mother's health behaviours* during pregnancy, such as drinking habits (no consumption, occasional consumption, daily consumption, excessive consumption), smoking habits (yes or no) and adequacy of access to prenatal care, (PNC) *the quality of assistance received*, including the presence and participation to pregnancy-supporting courses and (iv) *neonatal information*.

We calculated mothers' pre-pregnancy BMI dividing weight before pregnancy (in kilograms) by the square of height (in meters). Weight and height of patients were self-reported. This continuous indicator of body mass was then categorized under the usual 4 classes of: (i) underweight (BMI <18.5 kg/m^2), (ii) normal weight (18.5 kg/m$^2 \leq$ BMI <25 kg/m^2), (iii) overweight (25 kg/ m$^2 \leq$ BMI <30 kg/m^2) and (iv) obese (BMI ≥ 30 kg/m^2) individuals. Moreover, we also have information on mother's weight at the end of pregnancy, which was used to calculate the amount of weight gained during pregnancy by each respondent. We used this indicator to obtain a categorical variable defining three classes of possible weight gains during pregnancy - i.e., less than normal (inadequate), normal (optimal) and more than normal (excessive). It is worth noticing that categories were defined using thresholds that vary in relation to the initial weight of respondents, as suggested by IOM (8). We used these categories to classify women who increased their weight during pregnancy by a smaller or greater amount than those stated in Table 1, for each BMI class of origin, as less or more than normal weight gainers, respectively. Lastly, those who increased their weight according to guidelines were classified as normal weight gainers.

Table 1 - Recommended weight variations during pregnancy, provided by IOM (2009).

Pre-pregnancy weight	Recommended weight gain (kg)	
	single birth	multiple births
Underweight (BMI < 18.5)	12.5-18	-
Normalweight (BMI 18.5-24.9)	11.5-16	17-25
Overweight (BMI 25-29.9)	7-11.5	14-23
Obese (BMI 30 or more)	5-9	11-19

Note: BMI = Body Mass Index (Kg/m^2); IOM = Institute of Medicine

As outcome measures, we defined three standard indicators of baby's feature at birth: (i) LBW, defined as a dichotomous variable of value 1 if newborn's birthweight was below 2,500 grams, (ii) FM, defined as a dichotomous variable of value 1 if newborn's birthweight was above 4,000 grams and (iii) PTD, defined as a dichotomous variable of value 1 if newborn's gestational age was below the 37th week. We analysed with non-parametric test (Kernel density estimation) the effects of pre-pregnancy BMI and GWGs on both LBW and FM for the entire sample of mothers and, as a sensitivity analysis, only on mothers who gave birth after the 37th gestational week.

Logistic regression models were used to estimate the adjusted odds-ratios of women belonging to any initial BMI class different from normal (used as the reference category) and of women who increased their weight by an amount smaller or greater than normal, controlling for a large set of observable confounders.

Results

Table 2 lists summary statistics of weight gain and covariates of our sample. Figure 1 shows the estimated Kernel density functions for mothers' BMI before delivery, newborns' birth weight and gestational age, by type of GWG: less, normal and more than normal, represented by the dashed, solid and dot-dashed lines, respectively. There is preliminary evidence indicating that women with higher initial BMI are those who tend to gain more weight. Moreover, those with more than normal GWG are even associated to an empirical distribution of children's birthweight more shifted to the right, suggesting a higher probability to have babies with FM. On the contrary, women with a less than normal GWG present an empirical

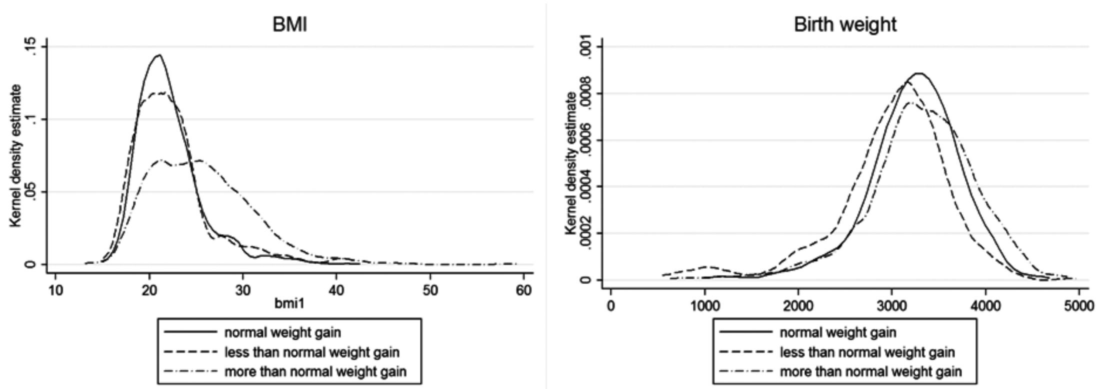

Fig. 1 - Empirical density distributions of mothers' BMI (Body Mass Index), newborns' birth weight and gestational age by type of weight gain during pregnancy.

Table 2 - Descriptive statistics, by type of weight gain during pregnancy

Weight gain	Less than normal		Normal		More than normal	
Variable	Mean	SD	Mean	SD	Mean	SD
Birthweight	2,982.93	637.02	3,228.90	500.22	3,309.25	590.24
% of low birthweight	15.46	36.19	7.22	25.90	7.89	26.98
% of high birthweight	6.46	23.74	9.60	30.10	17.96	38.24
Gestational age	38.14	3.02	38.84	1.94	38.90	2.05
% of pre-term births	15.65	36.38	9.55	29.40	9.44	29.26
BMI and weight gain after pregnancy						
Body Mass Index (BMI)	22.40	4.30	22.19	3.62	25.60	5.42
Average weight gain	7.44	3.80	12.93	2.47	17.51	4.18
Underweight (BMI< 18.5)	13.78	29.34	9.65	28.31	3.68	29.43
Normalweight (18.5<=BMI<25)	71.50	45.20	74.85	43.41	43.13	49.57
Overweight (25<BMI<=30)	7.71	26.71	11.91	32.41	30.83	46.22
Obese (BMI > 30)	7.01	25.56	3.59	18.62	22.36	41.70
Nationality						
Italian	66.69	43.12	77.02	46.17	57.51	41.25
Other	33.31	35.78	22.98	29.98	42.49	39.98
Age classes						
< 25 years	8.89	35.48	8.42	39.57	9.90	41.75
25-30 years	16.82	37.45	19.40	39.57	23.48	42.42
30-35 years	34.58	47.62	35.32	47.82	30.83	46.22
35-40 years	31.07	46.33	27.62	44.73	26.68	44.26
> 40 years	8.64	28.14	9.24	28.97	9.11	28.79
Education						
Degree	37.16	47.38	43.82	47.55	32.22	48.76
High school	42.30	49.46	42.75	49.50	50.59	50.05
Low education	20.54	40.45	13.43	34.11	17.19	37.77
Employment status						
Employed	61.88	41.46	75.72	44.98	72.27	43.61
Housewife	22.59	41.87	13.27	33.94	17.15	37.72
Unemployed or student	15.53	36.26	11.01	31.32	10.58	30.78
Marital status						
Married	87.38	33.24	86.86	33.80	83.68	36.98
Unmarried	12.62	31.85	13.14	33.59	16.32	35.76
Previous deliveries						
1+	51.87	50.02	46.56	49.91	38.46	48.69
0	48.13	45.45	53.44	45.32	61.54	42.55
At least 4 prenatal visits						
Yes	91.33	28.17	94.96	21.88	94.39	23.03
No	8.67	27.49	5.04	21.34	5.61	21.41
First visit before 12th gestational week						
Yes	96.24	19.06	97.22	16.46	96.61	18.10
No	3.76	16.38	2.78	14.65	3.39	16.32
Number of observations	428		974		625	

Note: BMI = Body Mass Index (kg/m^2)

distribution shifted to the left, suggesting higher rates of LBW. Regarding gestational age, the results are less meaningful and require further investigation with formal statistical tests, which will be presented in detail in the next sections. However, from this simple analysis, we are not able to conclude which effect prevails between pre-pregnancy BMI and inadequate GWG in shaping newborns' health conditions. In order to test such hypothesis empirically, we will adopt the logistic regression analysis in the next section.

We have found that obese women have an increased risk of delivering LBW babies (Table 3), which is almost twice than that of normal weight women (O.R.= 1.9124; s.e. = 0.526). This effect is no more significant when applying the same model to pregnancies which reached the 37th gestational week. Instead, a less than normal GWG increases the probability of LBW by more than twice (O.R. = 2.3164; s.e. = 0.388), with respect to women with normal GWG. We find the same result when we consider only pregnancies which reached the 37th gestational week. Point estimates are slightly lower (O.R. = 2.2091; s.e. = 0.535), but confidence intervals widely overlap. For the probability of LBW, we do not find significant differences between women with more than normal GWG and the reference category.

Concerning the probability of FM (Table 3), pre-pregnancy BMI does not affect significantly this outcome. Whereas, less than normal GWGs decrease the probability of FM for both, all deliveries and for those who reached the 37th week. The odds-ratios are 0.5569 (s.e. = 0.138) and 0.5937 (s.e. = 0.148), respectively. This means that having a less than normal GWG decreases the probability of FM by 45% and 41%, respectively. Lastly, having a more than normal GWG increases the probability of FM significantly by more than twice compared to women with normal GWG. In this case the odds-ratios are 2.6232 (s.e. = 0.465) and 2.5642 (s.e. = 0.463) for all deliveries and for those who reached the 37th week, respectively.

Analysing the effect of pre-pregnancy BMI and GWG on the probability of PTD, we found that, being obese before pregnancy is an important risk factor, increasing the probability of PTD by 80% in comparison with normalweight women. The other BMI clinical classes are not significant in explaining differences in the probability of PTD. Whereas, as regards GWG, having a less than normal GWG increases the probability of PTD birth by 73% with a odds-ratio of 1.7338 (s.e. = 0.320). All other covariates included in the model have the expected sign, but are not very informative about outcome variables. It is worth noticing that smoking during pregnancy is always very significant and increases the probability of LBW and decreases FM, but has no effects on the probability of PTD.

Lastly, in Figures 2 and 3 we show the effect of pre-pregnancy BMI and weight gain during pregnancy on the probability of LBW, FM (for the entire sample and for births who reached the gestational age of at least of 37 weeks), and of PTD. As we can see, when we look at the probability of LBW, there is evidence of an increasing trend among coefficients, but only the one associated with the obese category is significantly higher than the others. However, this pronounced difference disappears when we consider only pregnancies after the 37th gestational week. According to the other outcomes, the only result worth noticing is the effect of being obese on the probability of PTD. When we look at Figure 3, and we focus on LBW, we can see that there is a very steep negatively shaped relationship with weight gains. The same result applies when we look at the probability of LBW for deliveries after the 37th gestational week. An opposite relationship was found for the probability of FM in which it is evident an increasing of weight gains across categories.

Table 3 - Logistic regression model to estimate the adjusted odds-ratios

Variables	LBW	LBW (gestational age ≥ 37)	FM	FM (gestational age ≥ 37)	PTD
	(1)	(2)	(3)	(4)	(5)
Underweight	1.1643	0.8050	0.9230	0.9525	1.2283
	(0.273)	(0.295)	(0.272)	(0.280)	(0.318)
Overweight	1.1566	1.0599	0.8312	0.8341	1.2365
	(0.249)	(0.337)	(0.181)	(0.187)	(0.279)
Obese	1.9124**	1.0886	0.7294	0.8202	1.8192**
	(0.526)	(0.475)	(0.246)	(0.282)	(0.517)
Less than normal GWG	2.3164***	2.2091***	0.5569**	0.5937**	1.7338***
	(0.388)	(0.535)	(0.138)	(0.148)	(0.320)
More than normal GWG	0.7779	0.8717	2.6232***	2.5642***	0.8801
	(0.147)	(0.230)	(0.465)	(0.463)	(0.176)
Foreign nationality	1.2761	1.3373	0.7988	0.8190	1.4651
	(0.362)	(0.585)	(0.284)	(0.294)	(0.430)
25-30 years	0.8151	0.5645	0.7604	0.7767	1.2205
	(0.237)	(0.245)	(0.251)	(0.258)	(0.395)
30-35 years	0.9521	0.9872	1.1385	1.1120	1.0386
	(0.264)	(0.387)	(0.353)	(0.350)	(0.339)
35-40 years	1.3752	1.2539	0.9349	0.9593	1.6938
	(0.401)	(0.514)	(0.313)	(0.327)	(0.576)
> 40 years	2.5724***	1.8582	0.6935	0.7751	2.5319**
	(0.842)	(0.896)	(0.286)	(0.325)	(0.931)
High school	1.6402***	1.3215	0.9733	1.0082	1.5622**
	(0.275)	(0.326)	(0.163)	(0.171)	(0.280)
Low education	1.6880**	1.6463	0.6557	0.7006	1.8034**
	(0.385)	(0.545)	(0.183)	(0.198)	(0.449)
Housewife	0.7138	0.5493	0.7688	0.8020	0.9490
	(0.181)	(0.216)	(0.195)	(0.211)	(0.250)
Unemployed or student	0.8827	0.6535	1.0340	1.0571	0.9983
	(0.202)	(0.213)	(0.253)	(0.259)	(0.247)
Unmarried	1.5816**	1.1805	0.7220	0.7549	1.8037**
	(0.358)	(0.346)	(0.165)	(0.175)	(0.495)
No previous deliveries	0.3831***	0.3664***	1.5403***	1.4525**	0.5571***
	(0.061)	(0.087)	(0.248)	(0.240)	(0.095)
Smoking during pregnancy	1.5596**	1.7492*	0.4079***	0.4073***	1.0157
	(0.333)	(0.506)	(0.137)	(0.137)	(0.255)
Chronic drinker	0.8326	0.8217	1.0785	1.0951	1.0657
	(0.160)	(0.239)	(0.212)	(0.219)	(0.212)
At least 4 prenatal care visits	0.7617	1.5695	0.9474	0.9816	0.4935**
	(0.211)	(0.763)	(0.344)	(0.383)	(0.141)
First visit before 12th week	0.4355**	0.1964***	0.8340	0.8161	0.9771
	(0.142)	(0.079)	(0.389)	(0.384)	(0.407)
Constant	0.2297***	0.1894**	0.1782***	0.1865***	0.0810***
	(0.107)	(0.130)	(0.108)	(0.115)	(0.043)
Observations	1,827	1,620	1,832	1,625	1,832
Adj. R-squared	0.06	0.06	0.06	0.06	0.03

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1; LBW = low birth weigth, FM = fetal macrosomia; PTD= preterm delivery

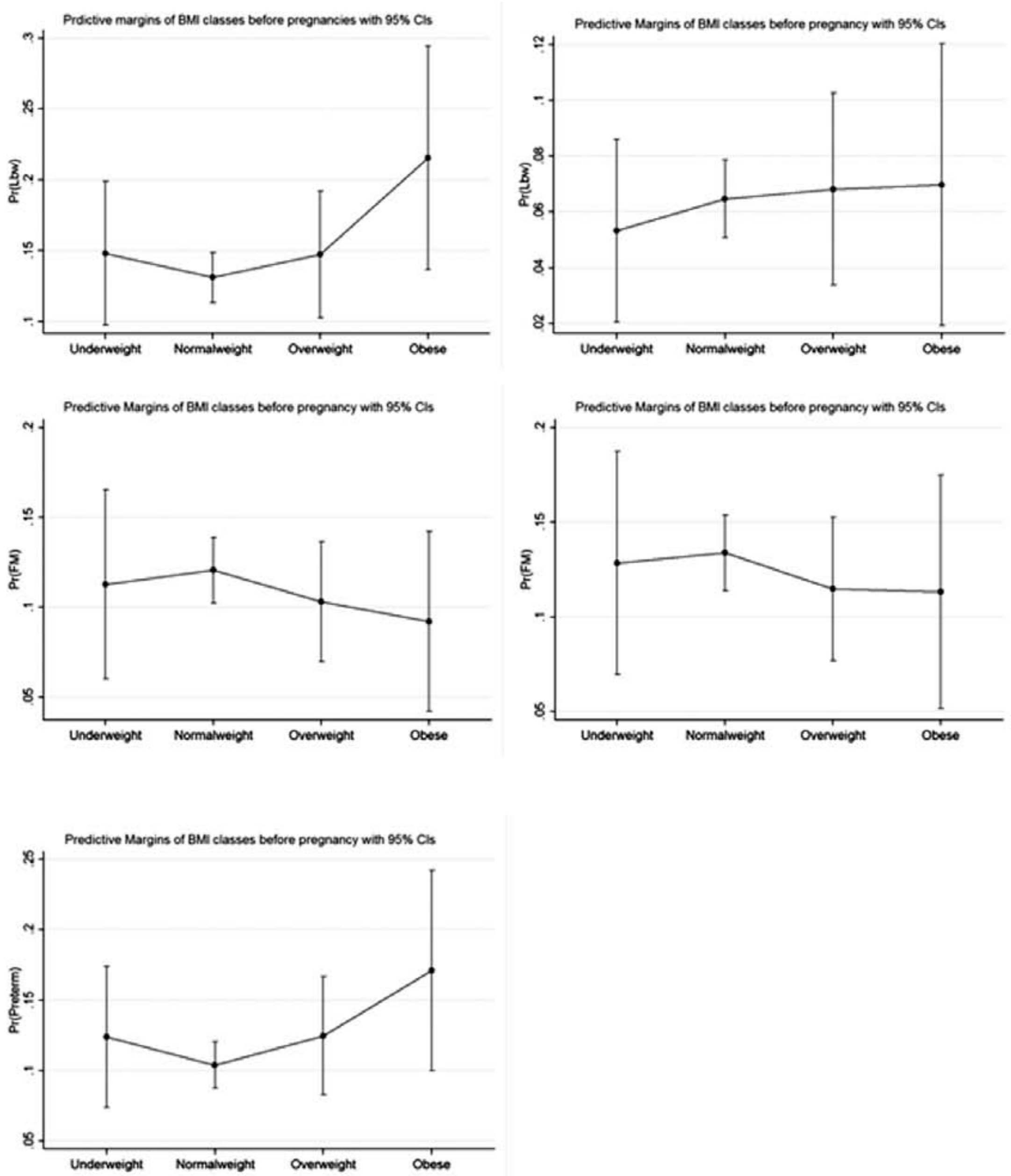

Figure 2 - Effect of pre-pregnancy BMI (Body Mass Index) on health outcomes by BMI class of mothers
Notes: For LBW (low birth weight) and FM (fetal macrosomia) we show estimates when all deliveries are included (left panels) and when only those reaching the 37th gestational week are considered (right panels).

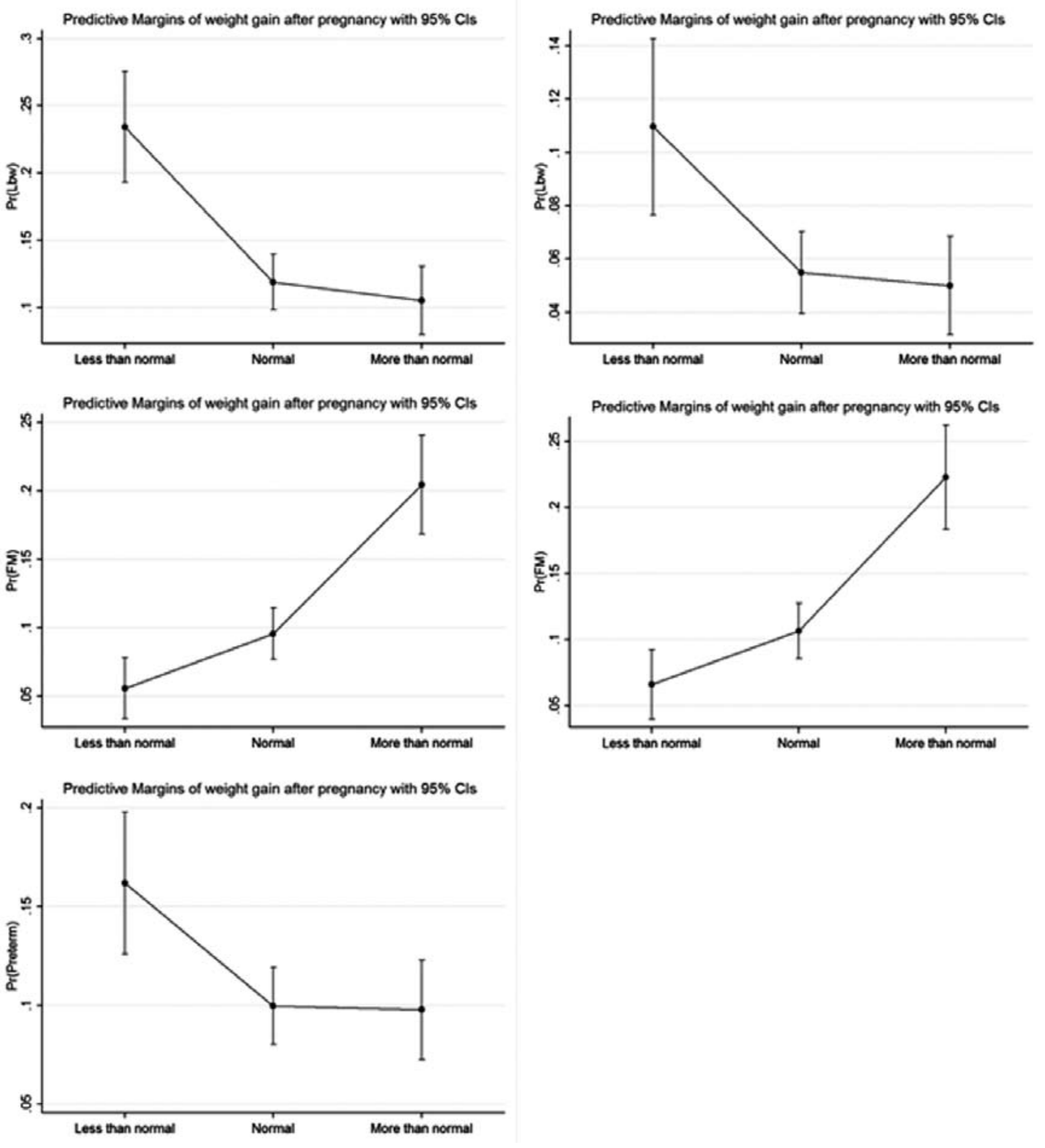

Figure 3 - Effect of pre-pregnancy BMI (Body Mass Index) on health outcomes by type of GWG (Gestational Weigth Gain).
Notes: For LBW (low birth weight) and FM (fetal macrosomia) we show estimates when all deliveries are included (left panels) and when only those reaching the 37th gestational week are considered (right panels).

Discussion

The aim of this paper was to investigate the relationship between adverse birth outcomes and pre-pregnancy BMI and weight gains during pregnancy. In particular, some recent studies (29, 30) pointed out that negative outcomes in newborns' health were associated with both maternal pre-pregnancy obesity and with excessive weight gain during pregnancy. With our analysis, we confirm this result, and show that underweight is associated with an increased risk of PTD. At first glance, we found that obesity was also associated with a higher probability of LBW, but this result was disproved when we accounted for the effect of PTD. In fact, after estimating the same model on a subsample of women who gave birth after the 37th gestational week, the significance of the coefficient disappeared. This suggests that significance in the first specification was driven by a strong correlation between obesity and PTD, confirmed by subsequent analysis and by (25).

As in Li et al. (29), we also assume that reverse causality may play a role. In particular, the Authors suppose that the association between maternal weight gains during pregnancy and the probability of having a large gestational weight, are not driven by weight gains, but rather by other observable confounders that influence both weight gains and the outcomes (e.g., maternal diet composition and physical activity level). In our view, reverse causality could be even more problematic if we consider that also unobservable characteristics may play a role, for example the level of orientation toward future health of women could be associated with gestational weight gains and neonatal health. We propose to control, or at least to mitigate the bias induced by this effect, by including variables that measure womens' health behaviours during pregnancy (smoking and drinking habits and the adequacy of use of PNC services) that should be highly correlated with observable and unobservable confounders not accounted in our empirical specification. This represents a major contribution of our work, since - to the best of our knowledge - no previous studies accounted for the distortion induced by reverse causality.

Our study is in line with the findings of Mitchell et al. (32), which highlight how the major difficulty in analyzing the relationship between GWG and PTD is represented by the fact that these variables are mutually dependent on gestational age. The Authors try to overcome this problem by adopting a survival model for the probability of delivery at a given gestational age. Regarding PTD we found non-significant associations with GWGs, and since the bias should be upward, we conclude that our results are not affected by this issue. Since the other outcomes could be affected, we provide estimates for all deliveries and, as a robustness check, only for deliveries which reached the 37th gestational week. Since we found very similar results for both samples, we conclude that in our case gestational age is not biasing odds-ratios heavily. This aspect needs further investigations and the adoption of more sophisticated statistical models. For instance, it would be possible to derive a predictive model for GWGs, estimate weight gains at the 37th gestational week for all deliveries and use this corrected variable as an unbiased indicator to predict adverse neonatal health outcomes.

Our results reveal that the risk of having LBW babies is significantly higher for women who increase weight by more than the suggested amount, and this result is confirmed when we account for PTD, by restricting our sample only to those who gave birth after the 37th gestational week. We find that pre-pregnancy BMI is not relevant in explaining differences in the probability of LBW as also found by Truong et al. (30) The same result is confirmed for FM: in this case not only less than normal weight gainers have a lower probability of FM, but also those who increase their weight by a more than normal amount show an increased risk of FM. As regards PTD, we find a significant relationship with obesity, as confirmed also by Truong et al. (30), meaning that in this case also pre-pregnancy BMI has to be considered partly responsible for an increased risk of PTD along with a less than normal weight gain. Being able to disentangle the effects of weight before pregnancy and weight variations during pregnancy on neonatal health is very relevant for Public Health Authorities, since the three indicators analyzed are usually associated also with the worst health conditions after birth (33). Especially LBW is associated with worse educational attainments and lower wages (34), whereas FM is associated with higher probability of diabetes in adult ages (11, 13, 15-16).

As a general conclusion, our study finds that weight variations during pregnancy, and especially those considered as non-normal by IOM (8), influence negatively health conditions at birth for each outcome analyzed. Whereas pre-pregnancy BMI is not to be held responsible for increased risk of LBW and FM, but is only associated with an increased risk of PTD. This result is especially relevant since, as highlighted by Mitchel et al. (32) there is no consensus yet about the amount of weight increase that should be considered as safe for newborns' health and that this amount may also depend on the target population. In our study, we tested the guidelines suggested by (8) in an Italian region and found that they seem to be appropriate in explaining newborns' adverse health outcomes, in terms of LBW, FM and PTD, whereas pre-pregnancy obesity was only associated with PTD.

Having a unique standard to define unhealthy weight gains during pregnancy and the use of BMI to calculate the classes of pre-pregnancy maternal obesity represent two major limitations for the analysis of the study. In fact it is well known, according to Burkhauser et al.(35), that BMI is an inaccurate measure since it does not distinguish fat from fat-free mass such as muscle and bone. This implies high rates of misclassification of individuals as obese and non-obese, with larger gaps when population with a strong multi-ethnic component is considered, e.g. the US. The same argument could be used to sustain that weight gains during pregnancy should be flawed by the same problem. Thus, an important improvement for future research on the topic would be to adopt more precise measures of body fat, to define BMI categories and unhealthy weight gains during pregnancy.

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Abbreviations

The following abbreviations are used in the manuscript:

BMI = body mass index
GWG = gestational weight gain
LBW = low birth weight
FM = fetal macrosomia
PTD = preterm delivery
PNC = prenatal care

Riassunto

Cambiamento di peso in gravidanza ed esiti avversi alla nascita: uno studio trasversale in Italia

Obiettivo. Analizzare gli effetti congiunti del peso pre-gravidico e degli inadeguati guadagni di peso gestazionale sugli outcomes del neonato, misurati tramite gli indicatori di peso alla nascita ed epoca gestazionale.

Metodologia. I dati sono stati raccolti presso l'Azienda Ospedaliera-Universitaria di Perugia (Umbria, Italia) su tutte le donne che consecutivamente hanno partorito presso il dipartimento di Ginecologia ed Ostetricia nell'anno 2013 (poco più di 2.000 partorienti). Per la classificazione

del guadagno di pesodurante la gravidanza sono state usate le linee guida proposte dall'Istituto di Medicina statunitense (IOM - Institute of Medicine,NutritionDuringPregnancy.Washington, DC). E' stata usata un'analisi multivariata per testare la probabilità di avere basso peso alla nascita, macrosomia fetale e/o parto pre-termine in relazione al guadagno di peso in gravidanza.

Risultati. È tata riscontrata maggiore probabilità di basso peso alla nascita sia con un forte aumento (OR = 1,9124, S.E. = 0,526) che con meno del normale aumento di peso (OR = 2,3614, S.E. = 0,388). La probabilità di macrosomia fetale è stata trovata essere associata positivamente con un aumento più del normale peso (OR = 2,6232, S.E. = 0,465).

Conclusioni. Sovrappeso ed obesità rappresentano un grosso problema per la salute pubblica. In particolare, il controllo del peso durante e prima della gravidanza potrebbe determinare negativi risultati di salute nei neonati. Nel nostro studio è stato riscontrato che le variazioni di peso inadeguate durante la gravidanza - secondo la classificazione dell'Istituto di Medicina americano – possono influenzare negativamente le condizioni di salute alla nascita, quali il basso peso alla nascita, la macrosomia fetale ed il parto pre-termine. Crediamo ci sia spazio e necessità per una migliore informazione ed educazione alimentare delle future madri e della popolazione in generale.

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