

Socioeconomic, demographic and nutritional factors associated with maternal weight gain in general practices in Southern Brazil

Fatores socioeconômicos, demográficos e nutricionais associados com ganho de peso gestacional em unidades básicas de saúde no Sul do Brasil

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Abstract

In order to describe adequacy of weight gain during pregnancy and its association with pre-pregnancy nutritional status and other factors, a cohort study of pregnant women enrolled at 16-36 weeks of gestation and followed up until delivery was carried out in prenatal care in primary care services in Rio Grande do Sul State, Brazil. Maternal weight was recorded at each prenatal care visit. Weight gain was classified as "adequate," "insufficient" or "excessive" (Institute of Medicine). Poisson regression was used to measure the associations. The sample was comprised of 667 women, and insufficient and excessive weight gain incidences were 25.8% and 44.8%, respectively. Overweight and obese before pregnancy had a significant increased risk of excessive weight gain in pregnancy (RR: 1.75; 95%CI: 1.48-2.07, RR: 1.55; 95%CI: 1.23-1.96, respectively). Women with fewer than six prenatal visits had a 52% increased risk for weight gain below recommended values. Although insufficient weight gain may still be a public health problem, excessive gain is becoming a concern that needs immediate attention in prenatal care.

Pregnancy; Weight Gain; Nutritional Status; Maternal Nutrition

Introduction

Pre-pregnancy nutritional status is a strong determinant of pregnancy weight gain and has a direct influence on obstetric outcomes ¹. Women with low pre-pregnancy weight have twice the chance of having low-weight infants ². A prospective study conducted in Brazil showed that women who were obese and overweight before pregnancy were more likely to have diabetes mellitus, preeclampsia and macrosomia during pregnancy ³; while other studies have shown that women who are obese before conception have a higher risk of hypertension, gestational diabetes, induced labor, cesarean delivery, late fetal death, macrosomia, low Apgar scores, infant trauma, and child obesity ^{4,5,6}.

Pregnancy weight gain is associated with maternal and fetal health as it may influence gestational age at birth, mode of delivery, birth weight, and maternal weight retention after delivery. An evaluation of such an index is essential for decision making in public health ^{7,8,9}.

Maternal weight gain that is below recommended levels is associated with low birth weight, prematurity, longer hospital stay and, consequently, higher health-related costs. Excessive weight gain, on the other hand, is associated with a higher incidence of macrosomia, cesarean delivery and child obesity ^{10,11,12,13}.

Pregnancy weight gain determinants include socio-demographic features, parity, smoking,

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pre-pregnancy nutritional status, and caloric intake. There remains a lack of information to relate dietary intakes to gestational weight gain even though it is a primary determinant of weight gain in non-pregnant individuals¹⁴. The gestational period is a critical part of life, in which nutrient intake should be higher¹⁰.

There are few studies conducted in developing countries investigating the association between socio-demographic factors and maternal nutrition, more specifically between nutritional status, food intake and weight gain during pregnancy^{8,15,16}. It is important to understand these factors as determinants of gestational weight gain if weight gain guidelines for women during pregnancy are to be revised.

The present study aims at measuring the adequacy of the total pregnancy weight gain and investigating its association with pre-pregnancy body mass index, caloric intake, socio-demographic and clinical factors. Therefore, observed results will serve as theoretical background for further application of an early nutritional intervention in pregnant women, in order to provide better obstetric outcomes in this social context.

Method

Study design and population

The *Study of Food Intake and Eating Behavior in Pregnancy* (ECCAGE) is a prospective cohort study of pregnant women followed until the puerperium. 780 pregnant women ($n = 780$) between their 16th and 36th gestational weeks were invited to participate in the study, 68 (8.6%) of whom refused to participate. Baseline measures were carried out in 18 primary care units located in poor neighborhoods in two cities in the State of Rio Grande do Sul (Porto Alegre and Bento Gonçalves), Brazil, between June 2006 and April 2007. Thus, the final baseline sample comprised 712 women. For gestational weight gain analysis, women were excluded when their weight was not registered until the 28th gestational week, when they were younger than 14 years old, when it was a multiple pregnancy, and when the delivery occurred before the 34th week of pregnancy. Accordingly, 45 (5.7%) women were excluded, leaving 667 pregnant women for the analysis.

This study was approved by the Research Ethics Committees of the Federal University of Rio Grande do Sul, Murialdo School Health Center, and Municipal Health Departments of Porto Alegre and Bento Gonçalves. Informed consent was signed by all women who agreed to participate.

Sample size

Figure 1 shows the sample distribution of the 780 pregnant women that were consecutively included. Refusals and losses accounted for 8.6% and 5.7% of women respectively; these were excluded. Thus, the final analysis of pregnancy weight gain was conducted with 667 participants.

Based on the relationship between pregnancy weight gain and caloric intake, a sample of 512 women would be needed to detect a number of a 3.32 odds ratio (95% confidence interval – 95%CI: 1.81-6.02) of increased caloric intake, assuming 34% incidence of excessive weight gain¹⁷. This sample size was calculated for $\alpha = 5\%$ and statistical power of 90%.

Data collection

Individual interviews were held in two follow-up waves. The first was during pregnancy and the second was in the immediate postpartum period. Participants were consecutively selected in the waiting room of the prenatal care units before the prenatal visit between their 16th and 36th gestational weeks. Interviews were conducted by trained interviewers in a private setting. At this point, weight and height were measured, caloric intake was evaluated using a food frequency questionnaire, and a further questionnaire was conducted containing socio-demographic information and questions on pre-gestational weight, whether the pregnancy had been planned or not, family income, smoking in pregnancy, and alcohol consumption. Nutritional guidance during pregnancy was also investigated using the following question: “*Did you have nutritional orientation during prenatal care?*”. Interviews were conducted by six trained interviewers.

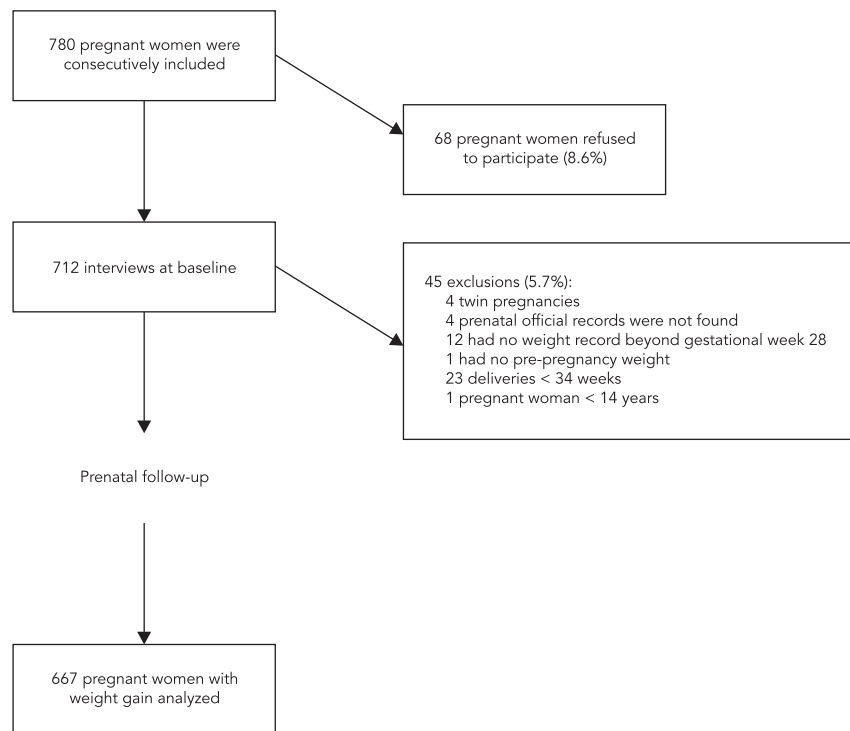
Follow-up data were collected in the immediate postpartum period. Information on delivery date and birth place was obtained by direct contact with the participant. Additional data regarding all prenatal visits, including weight, gestational age and ultrasounds were obtained through access to medical records.

Gestational weight gain

Total weight gain was calculated by the difference between the weight at the end of pregnancy obtained from medical records, and pre-pregnancy weight reported by participants at baseline. Final pregnancy weight was considered as the last weight recorded at least two weeks before delivery. For pregnant women who had no such weight record, values were attributed using the simple imputation method, adopting the first

Figure 1

Sample distribution flowchart of pregnant women receiving care at Primary Care Services in Southern Brazil, 2007.



weight recorded from the 2nd trimester as the basal component. The basal component was the pre-pregnancy weight in only seven women. Imputation of final weight was calculated based on the following equation:

$$FW = LRW + MWWG \times NMW$$

where: *FW* = final weight; *LRW* = last recorded weight; *MWWG* = mean weekly weight gain; and *NMW* = number of missing weeks.

Mean weekly weight gain was estimated as:

$$MWWG = \frac{LRW - FRW}{GA_{LRW} - GA_{FRW}}$$

where: *FRW* = first recorded weight from the 2nd trimester; *GA_{LRW}* = gestational age of last recorded weight; and *GA_{FRW}* = gestational age corresponding to the first weight recorded at the 2nd trimester.

Number of missing weeks was estimated as:

$$NMW = GA_D - GA_{LRW}$$

where: *GA_D* = gestational age at delivery.

Imputation of missing data on weight at the end of pregnancy was performed on 19.1% of the sample.

Total weight gain was classified according to the recommendation of the Institute of Medicine (IOM) ¹⁴. Total weight gain between 12.5 and 18kg was considered adequate for women with pre-pregnancy body mass index (BMI) below 18.5kg/m², between 11.5 and 16kg for women with pre-pregnancy BMI between 18.5 and 24.9kg/m², and between 7 and 11.5kg/m² for women with pre-pregnancy BMI between 25 and 29.9kg/m². Total weight gain between 5 and 9kg was considered appropriate when pre-pregnancy BMI was higher than or equal to 30kg/m².

Gestational age

Gestational age was calculated using the ultrasound estimation provided the exam was performed no later than the 20th week of gestation. For participants whose ultrasounds were carried out after week 20, gestational age was calculated

using the mean between age estimated by ultrasound and age calculated by last menstruation. For those who did not have an ultrasound, gestational age was calculated only from the reported date of last menstruation.

Daily caloric intake

Data on food intake were collected through an 88-item *Food Frequency Questionnaire* (FFQ), derived from a previously validated questionnaire¹⁸ and validated for this population. The questionnaire provided standard servings of each food item to assess the amount consumed during pregnancy¹⁹.

Estimates of energy intake, based on the FFQ, were obtained by programming the software SPSS for Windows (SPSS Inc., Chicago, U.S.A.), using the following equation: calories consumed per day = (number of servings consumed) x (frequency of consumption) x (nutrient content of the food serving), using Brazilian food composition tables as a reference^{20,21}. The recommended energy intake for pregnant women based on the *Dietary Reference Intakes*²² was not employed due to the fact that the FFQ tends to overestimate calorie consumption. The reference values that were used originated from the data of the current study. The cut off points for adequate consumption were obtained from the limits of the 95%CI of the caloric intake of pregnant women who had a BMI of between 18.5 and 24.9kg/m² at early pregnancy and who gained weight within recommended values. This was set to determine the variation interval of energy intake considered adequate for this sample. Therefore, the variable "energy intake" was evaluated in three categories: 800-2,778.9kcal/day, between 2,778.9 and 3,098.8kcal/day, and 3,098.8 - 4,800kcal/day. Adequate energy intake ranged between 2,778.9 and 3,098.8kcal/day, and the other categories refer to energy intake below or above this interval.

For the analysis that included caloric intake, 97 women (12.4%) were excluded because their reported daily energy intake fell outside the usually accepted pregnancy range of 800kcal (3,347kJ) to 4,800kcal (20,083kJ), based on IOM^{10,23} recommendations, as applied in previous studies^{24,25,26,27}.

Statistical analysis

Data were described as means, standard deviations (SD) and percentages (%). Linear-by-Linear Association chi-square test (χ^2) was used to test the association between pre-pregnancy BMI and weight gain. Analyses were performed using two Poisson regression models with robust

variance. In the first model, the outcome variable was dichotomized into insufficient weight gain versus adequate and excessive weight gain; in the second model, it was dichotomized into excessive weight gain versus adequate and insufficient weight gain. Independent variables tested included maternal age, years of schooling, family income, number of children, gestational age at birth, planned pregnancy, pre-pregnancy BMI, number of prenatal visits, smoking, alcohol consumption, nutritional guidance, and daily caloric intake.

Those associations that resulted in $p < 0.20$ in the unadjusted analyses were included, step by step, in multiple Poisson regression models. The final model was the one with the lowest Akaike Information Criterion (AIC) corrected for a finite sample.

The significance level was set at 5% for all tests. Confidence intervals were 95%. The software programs used were SPSS v. 16 and R version 2.4.1 (The R Foundation for Statistical Computing, Vienna, Austria; <http://www.r-project.org>).

Results

Sociodemographic, nutritional, behavioral and dietary characteristics of the sample of 667 women are described in Table 1. Gestational age was evaluated by ultrasound before week 20 in 365 women (54.7%), by the mean of ultrasound above week 20 and date of last menstruation in 153 women (23%), and using date of last menstruation only in 149 participants (22.3%).

Mean total pregnancy weight gain was 13.9kg (± 6.5). Weight variation during pregnancy ranged from -7kg to 38.4kg, and weight loss was reported by 13 women (2.1%). Of those women whose weight was lower at the end of pregnancy than at the beginning ($n = 13$), 30.7% ($n = 4$) were considered overweight, and 69.2% ($n = 9$) obese. Among 667 pregnant women with weight gain analyzed, the percentages with insufficient and excessive maternal weight gain were 25.8 and 44.8%, respectively, according to the IOM classification. Table 2 showed incidences of pregnancy weight gain according to the categories of pre-pregnancy BMI. Women who started pregnancy with low pre-pregnancy BMI ($< 18.5\text{kg/m}^2$) had a higher proportion of insufficient weight gain ($p < 0.001$). On the other hand, women who had BMI of between 25 and 29.9kg/m² at early pregnancy had higher proportions of excessive weight gain, which occurred in 66.2% of them ($p < 0.001$). In addition, 81.1% of pregnant women who had pre-pregnancy obesity had inappropriate weight gain, either excessive or insufficient.

Table 1

Socio-demographic, clinical and dietary characteristics of pregnant women receiving care at Primary Care Services in Southern Brazil, 2007 (n = 667).

Variables	Mean (SD)	n	%
Age (years)	25 (6.4)		
≤ 19		162	24.3
20-29		330	49.5
> 30		175	26.2
Years of schooling	7.6 (2.7)		
0-4		92	13.8
5-8		327	49.0
≥ 9		248	37.2
Family income *	2.6 (1.9)		
Number of children	1.0 (1.3)		
Planned pregnancy			
No		415	62.2
Yes		252	37.8
Pre-pregnancy BMI (kg/m ²)	24.25 (4.7)		
< 18.5		26	3.9
18.5-24.9		414	62.1
25.0-29.9		148	22.2
> 30.0		79	11.8
Number of visits	7.6 (2.7)		
≤ 6		227	34.0
7-9		287	43.0
≥ 10		153	22.9
Smoking during pregnancy			
No		529	84.1
Yes		138	20.7
Alcohol use during pregnancy			
No		561	84.1
Yes		106	15.9
Received nutritional guidance			
No		387	58.0
Yes		280	42.0
Calories (kcal/day) **	2,838 (911)		
800.0-2,778.9		283	49.6
2,778.9-3,098.8		76	13.3
> 3,098.8		211	37.0

BMI: body mass index.

* Minimum wages;

** n = 570, because we excluded women with caloric intake < 800kcal and > 4,800kcal.

Table 3 shows univariate Poisson regression analyses with robust variance for outcomes of insufficient pregnancy weight gain and excessive pregnancy weight gain, as well as sociodemographic, nutritional and dietary variables. Insufficient weight gain was associated with a higher number of factors than excessive weight gain. Insufficient weight gain was significantly asso-

ciated with pre-pregnancy BMI, maternal age, family income, planned pregnancy and number of prenatal visits. Significant associations for excessive weight gain with pre-pregnancy BMI and number of prenatal visits were observed.

Table 4 shows the final models for insufficient and excessive weight based on multivariate Poisson regressions with robust variance. Asso-

Table 2

Incidence of total pregnancy weight gain according to pre-pregnancy body mass index (BMI) of women receiving care at Primary Care Services in Southern Brazil, 2007 (n = 667).

Pre-pregnancy BMI (kg/m ²)	N	%	Pregnancy weight gain *					
			Insufficient		Adequate		Excessive	
			n	%	n	%	n	%
< 18.5	26	3.9	12	46.2	11	42.3	3	11.5
18.5-24.9	414	62.0	123	29.7	138	33.3	153	37.0
25.0-29.9	148	22.2	18	12.2	32	21.6	98	66.2
> 30.0	79	11.8	19	24.1	15	19.0	45	57.0

* p < 0.001, Linear-by-Linear Association test.

ciations were similar to those of the univariate analyses in terms of magnitude and direction of associations. Compared to women with normal weight before pregnancy those who had BMI of between 25 and 29.9kg/m² in early pregnancy had a 58% lower risk of insufficient weight gain during pregnancy; compared to the same reference group, having pre-pregnancy BMI lower than 18.5kg/m² was not a risk factor for insufficient weight gain. Women with fewer than six prenatal visits had a 52% greater risk of weight gain below recommended values compared to the remaining women (Table 4).

Those who started pregnancy as overweight had a 75% increased risk (95%CI: 1.48-2.07) of excessive weight gain during pregnancy compared to the reference category. Pre-pregnancy obesity increased by 55% the risk of excessive weight gain by the end of pregnancy compared to the reference category. Women who had BMI below 18.5kg/m² in early pregnancy had a 69% lower risk of excessive weight gain than the reference category. Pregnant women who had fewer prenatal visits (≤ 6 visits) had a lower risk of excessive weight gain, compared to the remaining ones.

Discussion

The results observed in the present study point to relevant aspects of maternal nutrition by emphasizing improper pregnancy weight gain among women receiving care in Primary Care Services. For most categories of pre-pregnancy body mass index, the incidence of excessive or insufficient weight gain was high. Results also pointed to the existence of two paradoxes. First, having few prenatal visits is a risk factor for insufficient weight gain, and a protective factor against excessive weight gain. Secondly, starting pregnancy with

overweight or obesity proved to be a risk for excessive weight gain, but having low pre-pregnancy BMI was not a risk for insufficient weight gain during pregnancy.

Among women with pre-pregnancy obesity, the vast majority (81.1%) showed inappropriate weight gain, either insufficient (24.1%) or excessive (57.0%). The incidence of excessive weight gain, found in 44.8% of the sample, is close to that found in a survey of weight gain records during pregnancy in five American states from 1990 to 1996, whose percentage of excessive weight gain in American-Hispanic women was 39%²⁸. The incidence of weight gain below recommended values was 25.8%, higher than that of Hispanic women and pregnant women from the United States among whom the incidence of insufficient weight gain during pregnancy was 22% and 16%, respectively^{29,30}. Brazilian studies on pregnant women in the primary health network found 38% and 36.5% of insufficient weight gain, and 29% and 29.1% incidence of excessive weight gain in 1995 and 2001, respectively^{15,16}. A prospective study with 173 pregnant women and their newborns monitored at a primary health care in Rio de Janeiro in 2007 found high prevalences of insufficient and excessive gestational weight gain and only 36.4% of the women studied found themselves within the IOM recommended levels³¹.

In the present study, excessive weight gain was more frequent in women who were overweight prior to pregnancy. This is a reason for concern due to the possibility of increased obesity in women at reproductive age. Similar results were found in North America. In a sample of 622 pregnant women being followed in Primary Care Services in the USA, the risk of excessive weight gain in women who started pregnancy with BMI between 26 and 29kg/m² was

Table 3

Univariate Poisson regression with robust variance between maternal weight gain and socio-demographic, clinical and dietary characteristics of pregnant women receiving care at Primary Care Services in Southern Brazil, 2007 (n = 667).

Variables	Weight gain			
	Insufficient		Excessive	
	Crude RR	p-value	Crude RR	p-value
Pre-pregnancy BMI (kg/m ²)				
< 18.5	1.55 (1.00-2.41)	0.05	0.31 (0.12-0.91)	0.033
18.5-24.9	1.00	-	1.00	-
25.0-29.9	0.41 (0.26-0.64)	< 0.001	1.79 (1.51-2.12)	< 0.001
> 30.0	0.81 (0.53-1.23)	0.323	1.54 (1.22-1.94)	< 0.001
Age (years)				
≤ 19	1.37 (1.02-1.85)	0.036	0.92 (0.74-1.13)	0.433
20-29	1.00	-	1.00	-
> 30	1.05 (0.76-1.45)	0.755	0.99 (0.81-1.22)	0.993
Years of schooling				
0-4	1.45 (0.98-2.15)	0.063	0.86 (0.65-1.14)	0.316
5-8	1.34 (0.99-1.80)	0.053	0.91 (0.77-1.10)	0.357
≥ 9	1.00	-	1.00	-
Family income *	0.92 (0.85-0.99)	0.033	1.02 (0.98-1.06)	0.342
Number of children	1.05 (0.91-1.23)	0.481	0.99 (0.89-1.09)	0.878
Planned pregnancy				
No	1.32 (1.00-1.76)	0.049	0.93 (0.78-1.10)	0.416
Yes	1.00	-	1.00	-
Number of prenatal visits				
≤ 6	1.57 (1.22-2.02)	< 0.001	0.66 (0.54-0.81)	< 0.001
> 6	1.00	-	1.00	-
Smoking during pregnancy				
No	1.00	-	1.00	-
Yes	1.08 (0.79-1.48)	0.595	1.04 (0.85-1.27)	0.678
Alcohol use during pregnancy				
No	1.00	-	1.00	-
Yes	1.11 (0.88-1.56)	0.513	0.77 (0.58-1.00)	0.058
Received nutritional guidance				
No	1.19 (0.91-1.55)	0.200	1.07 (0.84-1.19)	0.935
Yes	1.00	-	1.00	-
Daily caloric intake (kcal/day) ** (n = 570)				
< 2,778.9	0.92 (0.62-1.38)	0.714	1.05 (0.78-1.39)	0.74
2,778.9-3,098.8	1.00	-	1.00	-
> 3,098.8	0.73 (0.50-1.19)	0.244	1.07 (0.80-1.44)	0.631

BMI: body mass index.

* Minimum wages;

** Because we excluded women with caloric intake < 800kcal and > 4,800kcal.

4.97 (95%CI: 2.70-9.30) times higher than that of pregnant women who were eutrophic ³².

Where the amount of prenatal visits was below the recommended number of six, this proved to be a risk factor for insufficient weight gain. Current nutritional assistance in prenatal care

prioritizes maternal weight gain, discouraging restrictive diets and weight loss during pregnancy. Therefore, the focus of prenatal assistance is insufficient weight gain in order to prevent low-weight births ¹. This helps explain the finding that fewer prenatal visits might be a protective factor

Table 4

Multiple Poisson regression with robust variance of pregnant women receiving care at Primary Care Services in Southern Brazil, 2007 (n = 667).

Variables	Weight gain			
	Insufficient *		Excessive **	
	RR adjusted (95%CI)	p value	RR adjusted (95%CI)	p value
Pre-pregnancy BMI (kg/m ²)				
< 18.5	1.52 (0.97-2.41)	0.068	0.31 (0.10-0.92)	0.035
18.5-24.9	1.00	-	1.00	-
25.0-29.9	0.42 (0.26-0.66)	< 0.001	1.75 (1.48-2.07)	< 0.001
> 30.0	0.79 (0.52-1.21)	0.289	1.55 (1.23-1.96)	< 0.001
Number of prenatal visits				
≤ 6	1.52 (1.18-1.95)	0.001	0.67 (0.55-0.82)	< 0.001
> 6	1.00	-	1.00	-

BMI: body mass index.

* Adjusted for maternal age, maternal schooling level, family income, planned pregnancy and gestational age at birth;

** Adjusted for maternal age, alcohol consumption in pregnancy and gestational age at birth.

for excessive weight gain. There seems to be less attention to excessive weight gain, especially in women with overweight and obesity as there is no maximum limit for adequate weight gain. Finally, the possibility of residual confusion should also be considered, that is, other socioeconomic factors that were not evaluated in this study may be associated since pregnant women in less favorable conditions have fewer prenatal visits and have a higher incidence of pre-pregnancy low weight³³.

Another intriguing finding in this study indicates that being overweight or obese prior to pregnancy is a risk factor for excessive weight gain, but having low pre-pregnancy BMI is not a risk factor for insufficient weight gain during pregnancy. The latter finding may result from the traditional emphasis on insufficient weight gain to prevent low birth weight infants. Regarding the former finding, pregnant women with excessive weight before pregnancy may not receive orientation to prevent excessive weight gain. Under this hypothesis prenatal care may give greater attention to fetal rather than maternal health.

Excessive pregnancy weight gain should be considered a public health problem. It is estimated that, of all cases of obesity during the postpartum period, about 70% are due to excessive weight gain during pregnancy³⁴. Pregnancy is, therefore, a risk period for the development of obesity in women of a fertile age. A Brazilian cohort of pregnant women followed for nine months after delivery confirms that pregnancy

weight gain should be systematically monitored in prenatal care to prevent future obesity and associated chronic diseases¹⁶.

Limitations of this study include a single measurement of daily caloric intake during pregnancy; the research covered a broad time interval (between weeks 16 and 36), with the possibility of having a great variability of food intake between the second and third trimester of pregnancy. 71.2% of samples (n = 475) were taken during the second trimester and 28.8% (n = 192) in the third. Another possible limitation was the imputation of values for weights at the end of pregnancy in 19.1% of the sample, although the proportion of the sample in which imputation was used was lower than that used in another study (24.5%) that applied the same methodology³⁵. Reported pre-pregnancy weight was also used, which was supported by a strong correlation with measured weight, shown in previous studies on Brazilian pregnant women (r = 0.92)³⁶. Finally, different sources of secondary data were used, collected from official records to obtain information regarding the prenatal period.

Evaluation and management of excessive weight gain in individuals, especially in those with unfavorable socioeconomic conditions, have proven to be a hard task. Although there are guidelines for prenatal care issued by the Brazilian Ministry of Health, the management of weight gain during pregnancy seems to have been overlooked by health professionals³⁷. Due to the main focus on the infant and on insuffi-

cient maternal weight gain that causes low birth weight, risks resulting from a pregnancy with excessive weight gain and further weight excess in women may not be properly considered.

This study can contribute to a better understanding of the weight gain pattern in pregnant women receiving care in Primary Care Services and its associated factors, adjusted for caloric intake. Knowledge of this reality may allow for the development of public policies relative to weight control. Such actions may result in improvement in prenatal care and, consequently, in the health of this population, with guidance on eating habits even before conception, as pre-pregnancy body mass index is the main determinant of weight gain during pregnancy.

The increased epidemic of obesity and evidence relating maternal nutrition with the occurrence of chronic disease in adulthood³⁸, in addition to a high incidence of excessive weight gain during pregnancy should be considered as a public health problem. Weight gain and maternal nutrition should be constantly monitored in primary care services and indexes of maternal and fetal health should also be considered due to their strong correlation with obstetrical outcomes.

Resumo

Para caracterizar o ganho ponderal gestacional e sua associação com estado nutricional pré-gestacional e fatores relacionados à gravidez, realizou-se estudo de coorte com gestantes arroladas consecutivamente entre a 16ª e a 36ª semanas, e seguidas até o parto em serviços da rede básica de saúde do Estado do Rio Grande do Sul, Brasil. Informações do peso da gestante em cada consulta de pré-natal foram obtidas. Ganho de peso foi classificado conforme o Instituto de Medicina dos Estados Unidos. Regressão de Poisson com variância robusta foi utilizada. Incidências de ganho de peso insuficiente e excessivo das 667 gestantes foram de 25,8% e 44,8%, respectivamente. Gestantes com sobrepeso e obesidade pré-gestacional apresentaram risco para ganho ponderal excessivo (RR: 1,75; IC95%: 1,48-2,07 e RR: 1,55; IC95%: 1,23-1,96). Gestantes com menos de seis consultas de pré-natal tiveram risco de 52% de ganhar peso insuficiente. Embora o ganho ponderal insuficiente persista como um problema de saúde pública, o ganho excessivo está se configurando como uma questão que precisa de atenção imediata nos serviços de pré-natal.

Gravidez; Ganho de Peso; Estado Nutricional; Nutrição Materna

Contributors

M. Drehmer carried out the research and wrote the article. R. M. Soares, A. Giacomello, C. Melere, S. Ozcariz, J. Hoffmann, C. Buss, and P. Manzolli carried out the research and reviewed the article. M. I. Schmidt contributed to the study design and article write up. S. Camey worked on the data analysis and reviewed the manuscript. M. A. A. Nunes coordinated the study, provided orientation for the analysis, data interpretation, and reviewed the manuscript. M. T. A. Olinto reviewed the manuscript.

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