# Factors Associated With Women's Plans to Gain Weight Categorized as Above or Below the National Guidelines During Pregnancy

**Christina K. Park, BHSc,[1] Valerie Timm, RN,[2] Binod Neupane, MSc, PhD,[3] Joseph Beyene, MSc, PhD,[3] Louis A. Schmidt, PhD,[4] Sarah D. McDonald, MD, MSc[3,5]**

[1]Faculty of Health Sciences, McMaster University, Hamilton ON

[2]School of Nursing, Western University, London ON

[3]Department of Clinical Epidemiology and Biostatistics, Hamilton ON

[4]Department of Psychology, Neuroscience and Behaviour, McMaster University, Hamilton ON

[5]Departments of Obstetrics and Gynecology (Division of Maternal-Fetal Medicine) and Radiology, Hamilton ON

## Abstract

**Objective:** Given that *planning* to gain gestational weight categorized as above the national guidelines is associated with *actually* gaining above the guidelines, we sought to identify physical, lifestyle, knowledge, and psychological factors associated with planned weight gain.

**Methods:** Using a piloted, self-administered questionnaire, a cross-sectional study of women with singleton pregnancies was conducted. Women's plans for weight gain were categorized as above, within, or below the guidelines. Univariate and multivariate analyses were performed.

**Results:** The response rate was 90.7% (n = 330). Compared with women whose plans to gain weight were within the guidelines, women whose plans to gain were above the guidelines were more likely to be older (adjusted odds ratio [aOR] 1.09 per year; 95% CI 1.03 to 1.16), to have a greater pre-pregnancy BMI (aOR 1.17 per unit of BMI; 95% CI 1.10 to 1.25), to drink more than one glass of soft drink or juice per day (aOR 2.73; 95% CI 1.27 to 5.87), and to report receiving a recommendation by their care provider to gain weight above the guidelines (aOR 5.46; 95% CI 1.56 to 19.05). Women whose plans to gain weight were categorized as below the guidelines were more likely to eat lunch in front of a screen (aOR 2.27; 95% CI 1.11 to 4.66) and to aspire to greater social desirability (aOR 2.51; 95% CI 1.01 to 6.22).

**Conclusion:** Modifiable factors associated with planned gestational weight gain categorized as above the guidelines included soft drink or juice consumption and having a recommendation from a care provider, while planned weight gain categorized as below the guidelines was associated with eating lunch in front of a screen and social desirability.

**Key Words:** Planned gestational weight gain, psychological factors, lifestyle factors, counselling

Competing Interests: None declared.

Received on May 14, 2014

Accepted on October 15, 2014

## Résumé

**Objectif :** Puisque le fait de planifier l'atteinte d'un poids gestationnel classé comme étant supérieur à ce que recommandent les lignes directrices nationales est en fait associé à l'atteinte d'un tel poids, nous avons cherché à identifier les facteurs physiques, liés au mode de vie, liés aux connaissances et psychologiques qui sont associés au gain pondéral planifié.

**Méthodes :** Au moyen d'un questionnaire auto-administré (ayant fait l'objet d'un projet pilote), une étude transversale a été menée auprès de femmes connaissant une grossesse monofœtale. Les plans de ces femmes quant au gain pondéral ont été classés en fonction de leur relation avec les lignes directrices (gain supérieur à ce que recommandent celles-ci, gain respectant les recommandations de celles-ci ou gain inférieur à ce que recommandent celles-ci). Des analyses univariées et multivariées ont été menées.

**Résultats :** Le taux de réponse a été de 90,7 % (n = 330). Par comparaison avec les femmes qui planifiaient un gain pondéral respectant les recommandations des lignes directrices, les femmes qui planifiaient un gain pondéral supérieur à ce que recommandent les lignes directrices étaient plus susceptibles d'être plus âgées (rapport de cotes corrigé [RCc], 1,09 par année; IC à 95 %, 1,03 - 1,16), de présenter un IMC prégrossesse supérieur (RCc, 1,17 par unité d'IMC; IC à 95 %, 1,10 - 1,25), de boire plus d'un verre de boisson gazeuse ou de jus par jour (RCc, 2,73; IC à 95 %, 1,27 - 5,87) et de signaler que leur fournisseur de soins leur avait recommandé un gain pondéral supérieur à ce que recommandent les lignes directrices (RCc, 5,46; IC à 95 %, 1,56 - 19,05). Les femmes qui planifiaient un gain pondéral inférieur à ce que recommandent les lignes directrices étaient plus susceptibles de manger devant un écran (RCc, 2,27; IC à 95 %, 1,11 - 4,66) et d'aspirer à une désirabilité sociale plus importante (RCc, 2,51; IC à 95 %, 1,01 - 6,22).

**Conclusion :** Parmi les facteurs modifiables qui sont associés à la planification d'un gain pondéral supérieur à ce que recommandent les lignes directrices, on trouvait la consommation de boissons gazeuses ou de jus et le fait de disposer d'une recommandation en ce sens de la part d'un fournisseur de soins; la planification d'un gain pondéral inférieur à ce que recommandent les lignes directrices était quant à elle associée au fait de manger devant un écran et à la désirabilité sociale.

J Obstet Gynaecol Can 2015;37(3):225–235

## INTRODUCTION

Weight gain in pregnancy that is above the national recommendations in the United States[1] and Canada[2] is associated with increased health risks such as postpartum weight retention in mothers,[3–5] and being born large for gestational age in infants.[6–8] High birth weight is associated with doubling the odds of long-term obesity.[9] Therefore, as gestational weight gain (GWG) above the guidelines[1,2] increases the odds of adverse long-term health consequences for both mothers and infants, and as more women gain weight above the guidelines than below or within the guidelines,[8] it is important to explore factors that influence women to do so.

Previously identified factors that are associated with excess GWG are planned weight gain, watching television before bed, and greater need to appear socially desirable/neuroticism; weight gain below the guidelines has been associated with dissatisfaction with weight and watching television before bed, while having self-efficacy towards achieving healthy weight was protective.[10] Systematic reviews of interventions to increase adherence to gaining gestational weight within the guidelines have called for a need to better understand the psychological factors affecting GWG, while noting that these interventions were generally unsuccessful.[11,12] Since we found the factor most strongly associated with gaining weight above the guidelines was planning a weight gain categorized as above the guidelines (aOR 11.18, 95% CI 4.45 to 28.06),[10] we now wanted to identify not only the physical, lifestyle, and knowledge factors associated with planned GWG but also the relevant psychological factors.

## MATERIALS AND METHODS

A self-administered questionnaire was used to conduct a cross-sectional survey in May and June 2012. The questionnaire was piloted with women of child-bearing age to ensure questions were understandable and that it could be completed with ease in approximately 10 to 15 minutes. Data were collected from eight obstetric clinics and three midwifery clinics in Southwestern Ontario. Posters were displayed in the clinic to inform potential participants, who were then invited to take part by the clinic staff. The details of the methods have been previously described.[10]

Pregnant women were eligible for the study if they had a live, singleton gestation, were proficient enough in English to be able to complete the survey, and had had at least one previous prenatal visit. A sample of 330 women was used, based on the sample size calculation in a previous study estimating the proportion of women who reported counselling within the guidelines to within ± 6%.[13] We determined that 266 responses were required for the desired precision, and in anticipation of having up to 15% of data missing, the sample size was increased to a total of 310 women.[13] Our objective for this secondary analysis was to determine the physical, lifestyle, knowledge, and psychological factors associated with planned GWG categorized as above and below the national guidelines.[1,2] Our outcome was ascertained by asking women "How much weight do you plan to gain *in total* this pregnancy?" We calculated maternal BMI with self-reported height and pre-pregnancy weight to determine whether each woman's plans for GWG were above, within, or below the guidelines.[1,2]

Standard demographic variables such as race and education were collected. Physical factors included maternal age, pre-pregnancy BMI, gestational age, parity, and chronic health problems. Questions on lifestyle factors pertained to eating patterns, hours spent in front of a screen (e.g., television), hours of sleep, exercise, and smoking habits.

Knowledge factors included whether women reported receiving recommendations from a health care provider on GWG, and also having discussions with them regarding topics such as healthy eating, risks of too little or too much GWG, and breastfeeding.

Six validated scales or subscales were used to assess psychological factors. From Eysenck's Personality Questionnaire,[14] the emotional instability scale measured emotional lability and over-reactivity, and the social desirability scale measured the distortion of responses in an effort to appear socially desirable or "make a good impression."[15] Locus of control assessed whether women believed they had much control (internal locus) or little control (external locus) over their body weight.[16,17] Self-efficacy[17,18] was measured in terms of perceived control of food intake, confidence in getting regular exercise after pregnancy, and confidence in returning to their pre-pregnancy weight and shape.[17] The pregnancy weight attitudes scale[17,19] measured women's attitudes towards weight gain during pregnancy.[17] The single-item self-esteem scale determined the overall positive versus negative feelings