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Psychosocial factors and excessive gestational weight gain: The effect of parity in an Australian cohort

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ABSTRACT

Objectives: psychosocial variables can be protective or risk factors for excessive gestational weight gain (GWG). Parity has also been associated with GWG; however, its effect on psychosocial risk factors for GWG is yet to be determined. The aim of this study was to investigate if, and how, psychosocial factors vary in their impact on the GWG of primiparous and multiparous women.

Design/Participants: pregnant women were recruited in 2011 via study advertisements placed in hospitals, online, in parenting magazines, and at baby and children's markets, resulting in a sample of 256 women (113 primiparous, 143 multiparous). Participants completed questionnaires at 16–18 weeks' gestation and their pregravid BMI was recorded. Final weight before delivery was measured and used to calculate GWG.

Findings: the findings revealed that primiparous women had significantly higher feelings of attractiveness (a facet of body attitude; $p=0.01$) than multiparous women. Hierarchical regressions revealed that in the overall sample, increased GWG was associated significantly with lower pre-pregnancy BMI (standardised coefficient $\beta=-0.39$, $p<0.001$), higher anxiety symptoms ($\beta=0.25$, $p=0.004$), and reduced self-efficacy to eat a healthy diet ($\beta=-0.20$, $p=0.02$). Although higher GWG was predicted significantly by decreased feelings of strength and fitness for primiparous women ($\beta=-0.25$, $p=0.04$) and higher anxiety was related significantly to greater GWG for multiparous women ($\beta=0.43$, $p<0.001$), statistical comparison of the model across the two groups suggested the magnitude of these effects did not differ across groups ($p>0.05$).

Conclusions/Implications for practice: the findings suggest that psychosocial screening and interventions by healthcare professionals may help to identify women who are at risk of excessive GWG, and there may be specific psychosocial factors that are more relevant for each parity group.

Introduction

Pregnancy is a time in which weight gain is expected in women; however this places mothers and their children at risk of long-term obesity (Walker, 2007). Excessive gestational weight gain (GWG), weight gain above the US Institute of Medicine's (Institute of Medicine [IOM], 2013) guidelines, is related to negative health outcomes for both the mother and infant, including maternal and childhood obesity (Nohr et al., 2008; Viswanathan et al., 2008; Alberico et al., 2014). While it is known that a lack of physical activity and unhealthy dietary behaviours contribute to excessive weight gain during pregnancy (Hill et al., 2013), in recent years more attention has been directed towards the role of psychological and social factors for excessive GWG. On the basis of a review of existing literature, it has been found that psychosocial factors relating to maternal distress, social relationships, and motivation can impede or assist women in making the necessary behaviour changes for preventing excessive GWG (Webb et al., 2008; Hill et al., 2013; McDonald et al., 2013; Hartley et al., 2015). In a conceptual model of the predictors of GWG, Hill et al. (2013) proposed that psychosocial variables can directly affect physical activity and eating behaviours which lead to excessive GWG, or via indirect pathways through other psychosocial, demographic or

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health behaviour change factors (Hill et al., 2013); however, rigorous empirical testing of this model has yet to be conducted. On the basis of the psychosocial factors identified in this model, the current study focused on the following variables: psychological distress, body attitudes, social support, self-efficacy, and self-esteem. The effect of psychosocial factors on a woman's health and wellbeing during pregnancy requires investigation given that psychological and behavioural issues can arise as an expectant mother adjusts to significant changes to her body and lifestyle, such as morning sickness, increased fatigue, stretch marks, acne and weight gain (Mayo Foundation for Medical Education and Research, 2011).

Another potential risk factor for excessive GWG is parity. Primiparous women (first-time mothers) have been found to be at greater risk for greater GWG than multiparous women (mothers who already have children) (National Research Council, 2007; Chu et al., 2009) across all BMI categories (Lan-Pidhainy et al., 2013). Excessive weight gain in primiparous women is problematic if pregnancy weight is retained in the post partum, as entering into following pregnancies with a heavier BMI increases a woman's likelihood of obesity in the future (Chu et al., 2009). Psychosocial factors appear to be experienced differently by primiparous and multiparous women. For instance, Hurley et al. (2005) found that multiparous women were more likely to experience depressed mood and stress during pregnancy, which is problematic as the same study found that stress was linked to greater intake of bread, oils, sweets, fats, and snacks (Hurley et al., 2005), thereby contributing to excessive weight gain. Hung (2004) found that multiparous women were significantly less stressed after the birth of their baby than primiparous women, but primiparous women experienced greater social support (Hung, 2004). As these psychosocial factors and GWG differ by parity, there may be a relationship between the variables, although this association is yet to be explored in the literature. Research into this area is required to determine if interventions in antenatal settings should be tailored for primiparous and multiparous women in order to assist weight management and prevent excessive GWG.

Given that both parity and psychosocial factors have been identified as risk factors for excessive GWG, an evaluation of how these factors are related is warranted. The aim of this study was twofold: (1) to identify salient psychosocial predictors of excessive GWG for both primiparous and multiparous women; and (2) to determine whether these two models of psychosocial predictors of excessive GWG differed significantly. It was hypothesised that the psychosocial risk factors for GWG (depression, anxiety, stress, body attitudes, social support, self-esteem, and self-efficacy to initiate or maintain healthy lifestyle behaviours during pregnancy) would be significantly different for primiparous and multiparous women in early-mid pregnancy. Furthermore, it was expected that these risk factors would have a significantly different effect on GWG for primiparous in comparison to multiparous mothers.

Methods

Participants

Participants were recruited via study advertisements placed in a large tertiary hospital in the Western region of Melbourne, Australia, or on online mother, child and baby forums, in parenting magazines, and at baby and children's markets. Women interested in participating contacted the project manager and were emailed a plain language statement and consent forms. Upon providing consent, participants were assigned an identification (ID) number to ensure confidentiality, and only ID numbers were listed on questionnaires. Participants were eligible if they were less than 18 weeks' gestation, over 18 years of age, and fluent in English, resulting in a sample size of 401 women who consented to the study. There were no differences in women who were included or excluded in regards to demographic variables. The final sample size was 256 participants (63.34% of the original sample), comprising 113 primiparous and 143 multiparous women. Ethical approval was granted by the *** Research Ethics and *** Human Research Ethics Committees.

Measures

Demographics

Demographic information was obtained in the questionnaire including age, ethnicity, parity, education level, and income.

Psychological distress

Anxiety and stress were measured using the Depression Anxiety Stress Scale 21 (DASS-21; Lovibond and Lovibond, 1995). Participants indicated the extent to which a statement applied to them during the past week from 0 (*Did not apply to me at all*) to 3 (*Applied to me very much, or most of the time*). Subscale totals were calculated by summing anxiety items and stress items, respectively. The DASS-21 has been validated in pregnant women (Rallis et al., 2014; Miller et al., 2006). Cronbach's alphas for the current study were 0.83 for Anxiety, and 0.92 for Stress. Depressive symptoms were measured using the Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987). Participants indicated how frequently and severely (on a scale of 0–3) they experienced a symptom of depression in the past seven days. The EPDS has been validated for use in pregnancy (Adouard et al., 2005). Cronbach's alpha for the current study was 0.89. Although the Stress and Anxiety subscales of the DASS are suitable in pregnant populations, the EPDS is preferred to the depression subscale of the DASS because its acceptability has been tested and approved by pregnant women (Leigh and Milgrom, 2007).

Body attitudes

The Ben-Tovim Walker Body Attitudes Questionnaire (BAQ; Ben-Tovim and Walker, 1991) measured body attitudes using three subscales relevant to pregnancy: strength and fitness, feeling fat, and attractiveness (Skouteris et al., 2005). Participants indicated their agreement in relation to how they felt about their body over the past month from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). The three subscales were calculated by summing their corresponding items. Cronbach's alphas were 0.88, 0.62, and 0.67 for the feeling fat, strength and fitness, and attractiveness subscales respectively.

Social support

The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) assessed a woman's level of felt social support during pregnancy, and has previously been validated for use in pregnant populations (Golbasi et al., 2010). Participants respond on a seven-point Likert-type response format (1 = very strongly disagree; 7 = very strongly agree). An overall total score for social support was used by summing responses to all items and Cronbach's alpha was 0.92.

Self-esteem

Self-esteem over the past month was assessed using the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965), which has demonstrated validity for use in pregnancy (Kamysheva et al., 2008; Ickovics et al., 2011). Participants indicated the extent of their agreement with statements such as '*On the whole, I am satisfied with myself*' from 0 (Strongly Disagree) to 3 (Strongly Agree). Scores were obtained by summing all items. Self-esteem

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