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Lifestyle intervention to prevent obesity during pregnancy: Implications and recommendations for research and implementation

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ABSTRACT

Maternal obesity and excessive gestational weight gain (GWG) are significant contributors to the global obesity epidemic. However, isolated lifestyle interventions to address this in pregnancy appear to have only modest benefit and responses can be variable. This paper aims to address the question of why the success of lifestyle interventions to prevent excessive GWG is suboptimal and variable. We suggest that there are inherent barriers to lifestyle change within pregnancy as a life stage, including the short window available for habit formation; the choice for women not to prioritise their weight; competing demands including physiological, financial, relationship, and social situations; and lack of self-efficacy among healthcare professionals on this topic. In order to address this problem, we propose that just like all successful public health approaches seeking to change behaviour, individual lifestyle interventions must be provided in the context of a supportive environment that enables, incentivises and rewards healthy changes. Future research should focus on a systems approach that integrates the needs of individuals with the context within which they exist. Borrowing from the social marketing principle of 'audience segmentation', we also need to truly understand the needs of individuals to design appropriately tailored interventions. This approach should also be applied to the preconception period for comprehensive prevention approaches. Additionally, relevant policy needs to reflect the changing evidence-based climate. Interventions in the clinical setting need to be integrally linked to multipronged obesity prevention efforts in the community, so that healthy weight goals are reinforced throughout the system.

Introduction

Maternal obesity and excessive gestational weight gain (GWG) are significant contributors to the global obesity epidemic with approximately 50% of women entering pregnancy overweight or obese and 50% of women gaining excess pregnancy weight (Hure et al., 2012; Kowal et al., 2012; Rasmussen and Yaktine, 2013; McPhie et al., 2015). Indeed, obesity before pregnancy predisposes women to infertility, hypertension, and gestational diabetes, along with offspring neurological, metabolic, and respiratory conditions (Callaway et al., 2006; Pantasri and Norman, 2014). Excess GWG is associated with adverse outcomes such as caesarean delivery, hypertensive disorders of pregnancy, gestational diabetes, and infant macrosomia (Rasmussen and Yaktine, 2013; Haugen et al., 2014). It is also linked with increased risk of short- and long-term obesity in both the mother and offspring (Siega-Riz et al., 2009; Mannan et al., 2013; Cohen et al., 2014). Prevention is key. Reducing the prevalence of maternal obesity would result in a significant improvement in adverse pregnancy outcomes; it is estimated that if all overweight and obese women reduced their weight by 10%, we could expect a 15% reduction in the risk for gestational diabetes, a 6% reduction in hypertension, and 3% reductions in the rates of caesarean sections and infants born large for gestational age (MacInnis et al., 2016).

Not surprisingly, substantial time and resources have been dedi-

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cated to designing and evaluating interventions to promote healthy GWG to minimise adverse outcomes for mother and infant and curb the rates of maternal obesity. Interventions have primarily been lifestyle-based. The most recent Cochrane review of diet, exercise or both for preventing excessive weight gain in pregnancy found that these interventions reduced the risk of excessive GWG by 20% on average (Muktabhant et al., 2015). Overall, only a modest reduction in total GWG was noted, consistent with prior literature (1.2–2.2 kg; Gardner et al., 2011; Thangaratinam et al., 2012; Hill et al., 2013a). It has been suggested, in alignment with weight management research in non-pregnant individuals (Lombard et al., 2009), that success may to be confined to certain population groups. For example, many interventions report that significant reductions in GWG occur only in overweight or obese, low income, or normal weight subgroups of participants (Skouteris et al., 2010), or in women at risk of developing gestational diabetes (Harrison et al., 2013). Therefore, despite some differences in recommendations regarding clinical weight management during pregnancy across developed nations (American College of Obstetricians and Gynaecologists [ACOG], 2013; Australian Health Ministers' Adivsory Council [AHMAC], 2012; National Institute for Health and Care Excellence [NICE], 2010), difficulties regarding the prevention of excessive gestational weight gain appear to be universal.

The Health in Pregnancy and Post Birth (HIPP) trial was conducted in an attempt to identify and overcome many of the existing limitations to GWG interventions (Skouteris et al., 2016). The Australian HIPP intervention focused on improving motivation to change lifestyle behaviours through health coaching, embedding health behaviour change theory and mobilising tried and tested behaviour change techniques to improve behaviours, rather than simply offering education. Although HIPP resulted in positive effects on motivation to achieve healthy GWG, knowledge of appropriate GWG, coping skills, and sleep quality, it was not able to reduce the rate of excessive GWG or minimise total GWG compared to both education alone and usual care (Hill et al., 2016b; Skouteris et al., 2016). This finding is common in the literature, including the multicentre LIMIT randomised controlled trial of over 2000 women (Dodd et al., 2014). In contrast, the HeLP-her lifestyle intervention in pregnancy for women at increased risk of gestational diabetes was successful. This simple behavioural lifestyle intervention was integrated into routine care and had high engagement and low attrition (Harrison et al., 2013).

These findings lead one to speculate why the success of lifestyle interventions to prevent excessive GWG is so variable both within a given intervention and across interventions. Perhaps the issue partly lies not within the individual interventions themselves, but are inherent within pregnancy as a life stage. This paper discusses potential reasons for the difficulties in implementing interventions during pregnancy, using lessons from the HIPP trial, and offers some possible areas for future research to try and curb the problem.

Challenges of lifestyle intervention during pregnancy

Whilst it is recognised that pregnancy is a time where women regularly interact with health professionals and where motivation for healthy outcomes for the infant reportedly improve engagement in healthy lifestyle, there are also many potential barriers to isolated individual lifestyle interventions focused only in pregnancy. Pregnancy is a relatively short life stage. However, pregnancy lifestyle interventions tend to begin late in trimester one or early in the second trimester (when the threat of miscarriage has subsided and maternity care has commenced), and end early in the third trimester due to the pending arrival of the infant. Behaviour change relies on the breakdown of unhealthy habits and the formation of new positive habits that can be maintained long term (Lally and Gardner, 2013), albeit habit formation averages 66 days of repetition of the behaviour, and can take from 18 to 254 days to be realised, with more complex behaviours taking longer (Lally et al., 2010). Pregnancy interventions, such as the HIPP trial, are designed to promote complex changes in lifestyle behaviours, yet last only 3–4 months and may therefore not result in new habit formation. The implication of this is that we are more likely to see sustained behaviour change and improvements in weight outcomes with interventions of longer duration or follow-up. Indeed, meta-analyses show that weight loss interventions of longer duration in non-pregnant populations tend to be more successful than shorter interventions (Richardson et al., 2008; Wu et al., 2009).

It has also been suggested that commencing interventions during early pregnancy may be prudent because many women gain much of their pregnancy weight in the first trimester (de Jersey et al., 2012). Women in the HIPP study had gained nearly four kilograms before 15 weeks gestation (Hill et al., 2016b). Another Australian study reported mean trimester one GWG to be four kilograms, double that recommended by the US Institute of Medicine (IOM; de Jersey et al., 2012; Rasmussen and Yaktine, 2013). In the same study, 10% of women had already reached or exceeded the total recommended GWG for their pre-pregnancy body mass index (BMI) by the end of their first trimester. High early GWG is strongly predictive of total excessive GWG (Carreno et al., 2012). However, beginning interventions during early pregnancy increases the risk of recruiting women who may go on to miscarry, adding a risk of distress for these women and increasing required study sample sizes and research costs.

Another potential issue with antenatal weight management interventions is that pregnancy is often perceived as a time of relaxation of the strict body ideals imposed on women in the non-pregnant state (Clark et al., 2009). A weight management goal is not consistent with this perception. In studies where lifestyle change is the focus for women in the intervention, weight management may not be a priority goal for women. Indeed, in the HIPP study, the majority of women did not choose to focus on weight as their overall pregnancy goal (Skouteris et al., 2016). This finding is supported by literature that indicates women express a lack of concern about their weight during pregnancy, often because it is not raised as an issue by their healthcare practitioner or assuming they will lose the weight gained through breast feeding (Olander et al., 2011). Additionally, a qualitative study exploring pregnant women's reasons for not seeking out and following dietary and physical activity advice revealed that women deliberately avoided adjustments to their lifestyle in order to reclaim their self-identity (i.e., not just a 'pregnant woman') and to take a break from healthful behaviours at a time free from criticism (Atkinson et al., 2016).

Life's competing demands may present an additional challenge to intervention during pregnancy. Pregnancy brings with it an array of changes in physiological, financial, relationship, and social situations. Pregnant women must also navigate popular media, educational materials such as leaflets and pamphlets, primary care appointments, specialist appointments, screening tests, potential complications, and impending childbirth, in addition to morning sickness, food aversions, fatigue or indigestion, making focusing on behaviour change difficult. In addition to this, weight management is but one of a plethora of issues care providers have to cover, and providers are often hampered by lack of time, training, skills and self-efficacy to broach the topic of maternal obesity or appropriate weight gain (Olander et al., 2011; Heslehurst et al., 2014). More specifically, health professionals are hesitant to discuss weight with women due to the sensitivity of this topic (Schmied et al., 2011; Heslehurst et al., 2014; Furness et al., 2015). These concerns are further reinforced by obese women reporting that they feel judged by health professionals raising the topic of their weight, and that the advice they receive about obesity during pregnancy is often vague or inconsistent (Lindhardt et al., 2013). As such, health professionals have asked for training in communication to be able to have conversations that are of a sensitive nature with overweight or obese women (Heslehurst et al., 2014; Furness et al., 2015). To reduce extra burden on clinical care and practitioners themselves, intervention designers often employ 'add on' approaches, such as that implemented in the HIPP Study, by providing intervention