Addressing obesity in pregnancy: The design and feasibility of an innovative intervention in NSW, Australia

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Abstract

Objective: Obesity amongst women of child bearing age is increasing at an unprecedented, rate throughout the Western world. This paper describes the design of an innovative, collaborative, antenatal intervention that aims to assist women to manage their weight during pregnancy and, presents aspects of the programme evaluation.

Data sources/study setting: The programme was introduced at two sites, one in South East Sydney and, the other on the Central North Coast of NSW. Data were drawn from both sites and pooled for analysis.

Study design: This evaluation used mixed methods drawing on qualitative and quantitative data.

Data collection methods: Focus groups were held with staff in the antenatal clinic, who were, responsible for recruiting to the new service. Members of staff were also asked to record BMI for all women offered the service and using a simple questionnaire, record the reasons women gave for declining the new service.

Principle findings: The recruitment rate to the new service was 35% though this result should be treated with caution. Those women with a BMI of >35 were twice as likely to elect to participate in the new service as women with a BMI of less than 35. Focus groups with midwives in the antenatal clinic responsible for recruitment identified three themes impacting on recruitment to the service; ‘finding the words’, ‘acknowledging challenges’ and ‘midwives’ knowledge’.

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Conclusions: Antenatal clinic midwives were unprepared for talking to women about their weight. Increasing the confidence and skills of staff in offering service innovations to eligible women is a major challenge to be met if new models of care are to be successful in addressing overweight and obesity in pregnancy.

Introduction

Australia is often viewed by other countries as a nation of sport-loving, healthy people though in reality over seven million Australians were estimated to be overweight or obese in 2004–2005.1 The World Health Organization classify overweight as people with a body mass index (BMI) of 25–29.9 kg/m², and obese as people with a BMI equal to, or more than 30 kg/m².2 Whilst it is advisable that women achieve normal BMI prior to pregnancy (BMI 18–24.9), in reality a large number of women enter pregnancy overweight or obese.3 Being overweight or obese when pregnant significantly increases the risk of morbidity and mortality for the woman and her baby, and predisposes the baby to obesity and other health problems later in life. Despite evidence demonstrating the implications and consequences of being overweight or obese during pregnancy it is surprising that antenatal care in Australia largely fails to address the needs of this group of women.

This article describes the design of an innovative, collaborative group-based antenatal care programme that aims to assist overweight and obese pregnant women to limit their weight gain in pregnancy to recommended levels. The new programme was offered at two sites in NSW Australia and was a significant departure from the standard care offered in our publicly funded antenatal clinics. Recruitment rates and results of a survey exploring reasons that women gave for declining to participate in the new service will also be presented. Findings from a focus group with midwives responsible for offering the new service to women are also presented to illustrate the challenges to be met when establishing service innovations to address overweight and obesity in pregnancy.

Overview

In common with other developed countries, the prevalence of overweight and obesity in Australia has more than doubled in the last two decades,3 with young women gaining weight at a faster rate than older women, and obesity occurring at a progressively younger age.4 The prevalence of overweight and obesity in women of childbearing age in Australia has been found to be 34–50%.4,5 The increase in rates of overweight and obesity in this group has implications for the health of Australian childbirth women and their families. Maternal obesity is a significant risk factor for adverse outcomes and co-morbidity during pregnancy and childbirth, and risks for adverse outcomes increase in line with increasing BMI.6

Obesity is a major predictor of maternal mortality7 and is also associated with a range of obstetric complications including: stillbirth, congenital malformations, macrosomia, birth injuries, gestational diabetes, hypertension, prolonged labour, caesarean birth and associated anaesthetic and surgical complications, and difficulty breastfeeding.8,9 In an Australian population, Callaway et al.10 found that overweight, obese and morbidly obese women were more likely to experience; hypertension, gestational diabetes, and hospital admission greater than 5 days. Overweight, obese and morbidly obese women had 1.50 [95% CI 1.36–1.66], 2.02 [1.79–2.29], and 2.54 [1.94–3.32] times the risk of caesarean section (respectively) than women of normal weight. Caesarean section brings its own set of risks, especially for an overweight and obese population.10 According to several US studies a proportion of overweight and obese pregnant women gain excessive weight during pregnancy11 and are more likely to retain the weight gained during pregnancy into the long term.12 This means that without intervention many overweight and obese pregnant women will experience incremental weight gain over their childbearing years and enter subsequent pregnancies even heavier.

Overweight and obesity amongst children is also increasing at alarming rates.13 Two of the factors associated with increased risk of overweight and obesity in infancy and childhood are excessive maternal weight gain and shorter than recommended duration of breastfeeding.14 In one study the risk of obesity at 7 years of age was increased by 48% in women who gained more weight than recommended during pregnancy compared to those who were within recommended limits.15 Obese and overweight women have lower rates of successful breastfeeding. Long term benefits of breastfeeding include reduced risks of obesity, type 2 diabetes mellitus, lower blood pressures and total cholesterol levels in adulthood.16 Thus any intervention that helps women to avoid excessive weight gain in pregnancy not only impacts on the woman and her health11 but also on that of her baby. Clinicians are calling for preventative measures to start in pregnancy13 so as to take advantage of the epigenetic effects of the intra-uterine environment14 thus preventing infant and childhood obesity. This is supported by the Institute of Medicine in the US17 who recommend limiting weight gain in pregnancy for this group of women.

Weight management in pregnancy

Evidence suggests that although overweight and obese women are at an increased risk of complications because of their pre-pregnancy BMI, they can reduce these risks during pregnancy and improve birth outcomes by limiting their weight gain during pregnancy.11,18,19

International guidelines on weight gain in pregnancy vary. The National Institute for Health and Clinical Excellence20 in the UK for example, recommends that overweight and obese women do not try to lose weight during pregnancy, but receive personalised advice on healthy eating. The Institute of Medicine and National Research Council17 in the US provide
more specific guidance on this topic. These well evaluated guidelines recommend that overweight (BMI 25.0–29.9 kg/m²) pregnant women gain between 7 and 11.5 kg (15–25 lb), and obese (BMI ≥30.0 kg/m²) pregnant women gain between 5 and 9 kg (11–20 lb) during pregnancy. In Australia, there are no national guidelines for weight gain in pregnancy, although Queensland has recently adopted the US Institute of Medicine and National Research Council’s recommendations in their Statewide clinical guidelines for the care of obese women during pregnancy.[21]

Pregnancy has been identified as an opportune time to promote healthy eating and physical activity in women as they are highly motivated to address health issues at this time.[22] However, there is a lack of evidence on the most effective way to support women to manage their weight during pregnancy. Two randomised controlled trials for example, involving one-to-one interventions; education on exercise and healthy eating[23] and energy restricted diet[24] failed to demonstrate any difference between the intervention and control groups. The need for evidence-based care for pregnant overweight and obese women has recently been identified in the UK as a research priority by the National Institute for Health and Clinical Excellence.[20] In Australia, researchers suggest that a multifaceted approach is needed to address this issue,[6] but currently few public maternity services exist that address the weight management needs of this group of women.

**Group based care**

There is evidence that group programmes can be more effective than individual or self-help approaches to weight management. One well conducted RCT found that a multi-component commercial group programme (Weight Watchers) was more effective in terms of weight loss and weight control over a 2-year period than individualised or self-help programmes.[25] Waleekhachonloet et al.[26] compared group behaviour therapy with individual behaviour therapy for promoting healthy dieting behaviour and weight control in overweight and obese women in a rural community in Thailand. The group behaviour therapy was found to be practical, cost and time effective and not inferior to individual therapy in terms of effectiveness.

Designing health care provision for groups instead of individuals is a relatively new idea that is increasingly attracting attention as a strategy to bring about behavioural change and provide social support. Group models of health care, particularly for the management of chronic disease, have begun to emerge and are showing improved clinical outcomes and patient satisfaction.[27,28] A group based model of antenatal care developed in the US[29] has demonstrated improved clinical outcomes. When compared to standard antenatal care this group based model achieved lower rates of preterm birth, improved psychosocial function, satisfaction with care, higher rates of breastfeeding,[30] lower rates of social isolation, low birth weight and improved social and emotional outcomes.[31] There were no differences in costs associated with care.[30] This model combines antenatal assessment, parenting education and support in a group setting, where the women draw on the knowledge and support of others in the group. This model has been introduced in Sydney Australia, demonstrating positive outcomes for women and midwives.[32] Group based care provides women with social support and this may be key to effective antenatal care and weight management interventions.

**Designing an antenatal intervention**

The new service model introduced at two sites in NSW Australia, uses group based antenatal care which includes antenatal care and assessment (BP, urinalysis, fundal height measurement, fetal heart rate etc.), education on healthy eating and physical activity in pregnancy, setting of weight management goals, peer support, encouragement and motivational techniques. The aim of the service is to provide a collaborative model of antenatal care whilst also assisting overweight and obese women to limit their weight gain in pregnancy to the levels recommended by the US Institute of Medicine[17] and the Queensland Government.[21]

The programme was developed by a steering committee with representation from midwifery, obstetrics, dietetics and physiotherapy. In addition, an implementation group was established at each site to facilitate the introduction of the new service model. The multidisciplinary nature of the implementation groups ensured that relevant expertise would be available to support the new service. Membership of the implementation groups included the project officer, a dietitian, a physiotherapist, a lactation consultant, an obstetrician, a health promotion manager, service managers and midwives. All staff involved in the new service underwent extensive training. This included information on nutrition (healthy eating), exercise (increasing activity in pregnancy), group facilitation skills, breastfeeding challenges, risks of obesity and perhaps most importantly, how to talk to women about their weight. Talking to overweight women about their health risks, and about making positive lifestyle changes, is challenging for all healthcare practitioners.[33] Internationally, midwives continue to report difficulty in raising this issue with women, fearing that they will offend them and that their relationships may be negatively affected as a result.[34,35] In order to improve communications skills in this area, the help of a motivational interviewing trainer was enlisted.

The programme consists of eight sessions (seven antenatal and one postnatal) of 2 h duration, facilitated by two midwives. They were held in community settings (Child and Family Health Centre and Community Health Centre) both with good parking with nearby bus and or train stations. Each group (of no more than 12 women of similar gestations) is facilitated by the same two midwives, providing women with continuity of carer during their pregnancy. Women weigh themselves at the beginning of each session and their brief antenatal assessment is performed by one midwife during the session. In line with the women’s assessed level of risk the services provide collaborative clinical care, shared by midwives and at specified visits, an obstetrician. The groups are attended regularly by a dietitian and physiotherapist who facilitate discussions around healthy eating, cooking or eating out as a family, healthy activity and support the women to develop their individual goals. Women who develop complications or require another health care provider (e.g. physician, endocrinologist, mental health worker) have the appropriate referral arranged and continue to attend the group based programme. In addition to the eight group-based
sessions the women are invited to attend a supportive weekly drop-in where they can weigh themselves and have the opportunity to discuss their healthy pregnancy plan and review their personal goals with their midwives. This activity is supported by the women’s WELL diary (the Weekly Eating and Lifestyle Log) which is incorporated into the antenatal hand-held notes and aims to keep women motivated throughout pregnancy.

Whilst the new service model is considered a service development initiative, ethical approval was gained for the evaluation of the programme (multi-site approval from Northern Sydney Central Coast Health Research Ethics committee). Evaluation of the programme included recruitment data and results of the recruitment survey. Findings from the evaluation are presented below.

Recruitment to the programme

Women with a BMI of greater than 25 are invited to participate in the new programme at their antenatal pregnancy booking visit. Standard care is also available to these women and this involves appointments with a midwife and/or obstetrician at the public antenatal hospital clinic. Standard care includes 8–11 antenatal appointments (depending on whether the woman is primiparous or multiparous) and additional specialist appointments or services as clinically indicated. Between April and December 2010, the new service was offered to 232 women at two sites; 81 women agreed to participate (37 at site 1 and 44 at site 2). The overall rate of acceptance was 35% which was similar in both sites.

BMI was documented for 217 of the 232 women who were offered the service and this ranged from 27.7 to 61.0. The mean BMI was 36.1 with a standard deviation of 4.9. Women in site 2 had a slightly higher mean BMI (36.3) than women from site 1 (35.9). Overall, there was a slightly higher proportion of women with a BMI of 35 or greater (53%) than with a BMI of less than 35 (47%). As indicated in Table 1, women with a BMI of >35 were more than twice as likely to accept the offer to take part in the new service as women with a BMI of 35 or less (OR 2.25, 95% CI 1.26–4.01, \( p = 0.006 \)).

A total of 151 women declined to participate in the new service. Staff members (midwives and clerical staff) in the antenatal clinic were asked to document the reasons women gave for declining the new service using a purpose developed survey tool requiring tick box responses. Reasons were documented for 98 (65%) women. More than one reason could be recorded therefore the total number of reasons provided total more than 98 (see Fig. 1). The category “other” included issues with transport, preference for an alternate model of care (Midwifery group practice or GP shared care), English as a second language, preference for a partner to attend, and clinical conditions requiring more frequent consultant appointments.

Focus groups with midwives

In order to further explore the process of recruitment to the new service, four focus groups were held (two on each site) with 17 consenting midwives who were responsible for offering the service to women in the antenatal clinic of each site. The focus groups were audio recorded and fully transcribed with the transcripts subjected to an iterative process of thematic analysis. In order to preserve the anonymity of

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| Figure 1 | Reasons for declining the new service. |
the participants, the four focus group transcripts were combined and analysed as a whole. All authors read the transcript independently, highlighting key words and phrases and combining similar words/phrases into emerging concepts and themes. The authors then met to discuss the emerging concepts and themes until agreement was reached as to the final themes. Thematic analysis revealed three major themes; these included; ‘finding the words’, ‘acknowledging challenges’ and ‘midwives’ knowledge’. Each theme is described below.

Finding the words

Antenatal clinic midwives endeavoured to raise the issue of the pregnant woman’s weight, in such a way as to avoid causing offence. Many agreed with the comments of one focus group member who declared “I found it extremely difficult…I found it hard to address…to find the words…”

If a woman was offended or became defensive this was distressing for the midwives. They were also aware that the issue was a sensitive one for some women and that it could be distressing for women to hear about the risks of overweight and obesity in pregnancy. They reported that their confidence and skills grew over time which is illustrated by the following comment from one participant, “I’ve got a spiel off pat now; it is better to be matter-of-fact with women than beating around the bush”.

For some midwives, the issue of their own weight impacted on their confidence in raising the issue with women. They felt hypocritical in highlighting the risks of overweight and obesity with women and recommending weight management in pregnancy when they were themselves overweight or obese. Another midwife used her own weight issue to advantage saying to women "you are not alone, look I am overweight". She considered that this helped to create a bond between the woman and herself.

Acknowledging challenges

Midwives were sensitive to the issues that pregnant women in their community faced such as lack of transport, childcare and time constraints. Some found the new service difficult to recommend to women who they knew would be challenged by these issues. Location of the service was seen as particularly important. The service needs to be located in places that are easily accessible, particularly for women who do not have private transport. These midwives also acknowledged that many women were working or caring for younger children and this made it difficult for them to access the new service. As one midwife commented "If they want to go [to the new service] and it’s not their first baby, childcare is an issue. And if it is their first baby, it’s work commitments".

Midwives themselves were challenged with time constraints. The booking-in visit is comprehensive and time consuming. Midwives felt that they already had a lot to cover in this visit and little time in which to do it. "We don’t have enough time amongst everything else". They had to prioritise the issues that were discussed with women and weight management was not always a priority. Midwives also worried that pregnant women were overwhelmed by the amount of information presented to them at this time.

Some overweight and obese women refused to acknowledge their weight as an issue claiming that they eat a good diet. This situation was difficult for midwives to manage as one midwife stated “you feel like you are flogging a dead horse”. Most important was maintaining a relationship with the pregnant women. If midwives felt the woman was offended, defensive or disinterested they retreated from the topic in order to maintain the relationship.

Midwives’ knowledge

Midwives’ knowledge in relation to weight gain, nutrition and exercise in pregnancy varied. Those more knowledgeable were more confident in discussing these issues with women and those less confident would tend to avoid it, “I don’t say anything, as I don’t know”. Some expressed a desire for further education in this area. Pregnancy was seen as an ideal time to raise the issue with many women as they were more focused on their health at this time.

The new service had the effect of raising awareness of the issues associated with overweight and obesity in pregnancy. Some midwives reported that as BMI had increased over time, overweight and obesity had been normalised. Many midwives had changed their practice as a result of the new service with one midwife commenting “I talk to all overweight women now about their weight even if they don’t want [the new service]”. Midwives found that they were making more referrals to dietitians than previously particularly for those obese women who declined to participate in the new service.

The new service became easier to recommend to women when these midwives had a better understanding or they received positive feedback about the service. As the service became more well-known in the community (or seen as mainstream rather than unconventional) it was also easier to recommend. In fact, some women requested the service before the midwife had a chance to raise it with them. Along with good knowledge of and positive feedback about the service, attractive and informative advertising was also seen as key to successful recruitment.

Discussion

Maternal overweight and obesity is a significant issue for maternity services yet there is little information available to inform service providers on the best approach to maternity care for this group of women. This paper describes a new service model for overweight and obese pregnant women and presents some of the survey and focus group data from the evaluation of the programme. In developing the new service model the steering group focused on the educational needs of the midwives facilitating the new programme. However, the findings from the focus groups with antenatal clinic staff (responsible for recruiting women for the new service model) revealed that many of these health professionals lacked the knowledge and skills to appropriately raise and discuss the issue of overweight and obesity with pregnant women. Studies both in Australia and the UK support the findings from our work. In focus groups with health professionals in three maternity units in NSW, Australia, Schmied et al. found that health professionals were not sure how to raise the issue of weight without offending overweight or obese pregnant
women. Studies with health professionals in the UK resulted in similar findings. Lack of clear guidelines on weight gain in pregnancy or appropriate care for this group compound the reluctance of staff to raise the issue with women.

In focus groups with prenatal and postnatal women in the UK, Olander et al. confirmed that few health professionals raised the issue of weight or monitored the weight gain of pregnant women. Pregnant women in this study had laissez faire attitudes to weight gain in pregnancy, believing that excessive weight could easily be lost through breastfeeding in the postnatal period. Pregnancy for some was a time to indulge and slacken the constraints they had previously imposed on their eating and lifestyle choices. This belief however is not supported by evidence which suggests that excessive weight gain in pregnancy can lead to overweight and obesity after pregnancy. Significantly, these women considered that if the issue was not raised by their health professional then it was not important.

Around a third of women (35%) offered the new service described in this model accepted the offer. This is in stark contrast to the study by Knight and Wyatt in the UK that achieved a recruitment rate of only 14.5% to a new service offering a dietary intervention for obese pregnant women. Our result should be treated with caution however as the denominator for the calculation of recruitment rate was the number of women with documented evidence of invitation (acceptance or completion of the “reasons for decline” survey). The service may have been declined by women without completion of the survey and this would inflate our recruitment rate.

The factors most often cited as relevant to women declining the service were related to accessibility (location and time of day) and childcare. Transport issues are particularly important to vulnerable groups who may not have access to private vehicles. Both our sites offered good parking and were near bus and train stations though public transport costs in this situation could have been prohibitive. Childcare was clearly an issue for multiparous women and timing of the sessions for women in employment. It was somewhat surprising that so few women cited the length of the group sessions (2 h) as an issue.

Overweight and obesity is visible unlike other health issues that may not be obvious to others. It is also an issue that is poorly understood by health professionals and society at large and as such overweight and obese pregnant women can face significant prejudice in health care and other arenas. Obese women have reported feelings of shame, guilt, embarrassment and humiliation. Midwives and other health professionals are right to feel apprehensive about raising the issue of weight with overweight and obese pregnant women as it must be managed with extreme sensitivity. Obese pregnant women (n = 10) in Nyman’s phenomenological study reported positive feelings when; they were able to participate in their own care, they were encouraged and supported by staff and when staff were interested in them and showed consideration. Poignantly Nyman et al. [40, p.427] state that “being seen behind the fat” was most important to these women.

Whilst it is important that maternity service providers respond to the needs of overweight and obese pregnant women by developing models of care that specifically meet their needs, it is equally important that all health professionals have the knowledge and skills to sensitively address weight with this group of women. This paper describes a new model of care for overweight and obese pregnant women reporting on the design and implementation of the programme. In relation to recruitment to the new programme the evaluation revealed that antenatal staff felt hesitant in raising the issue of weight with this group of women. They did however, become more confident over time. An important part of the evaluation of this programme will be the clinical outcomes of the women participating in the new model. This aspect of the evaluation is currently in progress.

Conclusion

The new model of care for overweight and obese pregnant women conducted in two maternity units in NSW was able to successfully recruit just over a third of eligible women to the service. Addressing the issues raised by the midwives responsible for offering the new service to women as part of the booking visit interview, may increase the proportion of women who choose this model of care. Further study is required to evaluate the success of the model in terms of assisting women to manage their weight in pregnancy and ultimately to improve maternity outcomes for mothers and babies at risk of complications due to overweight and obesity.

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