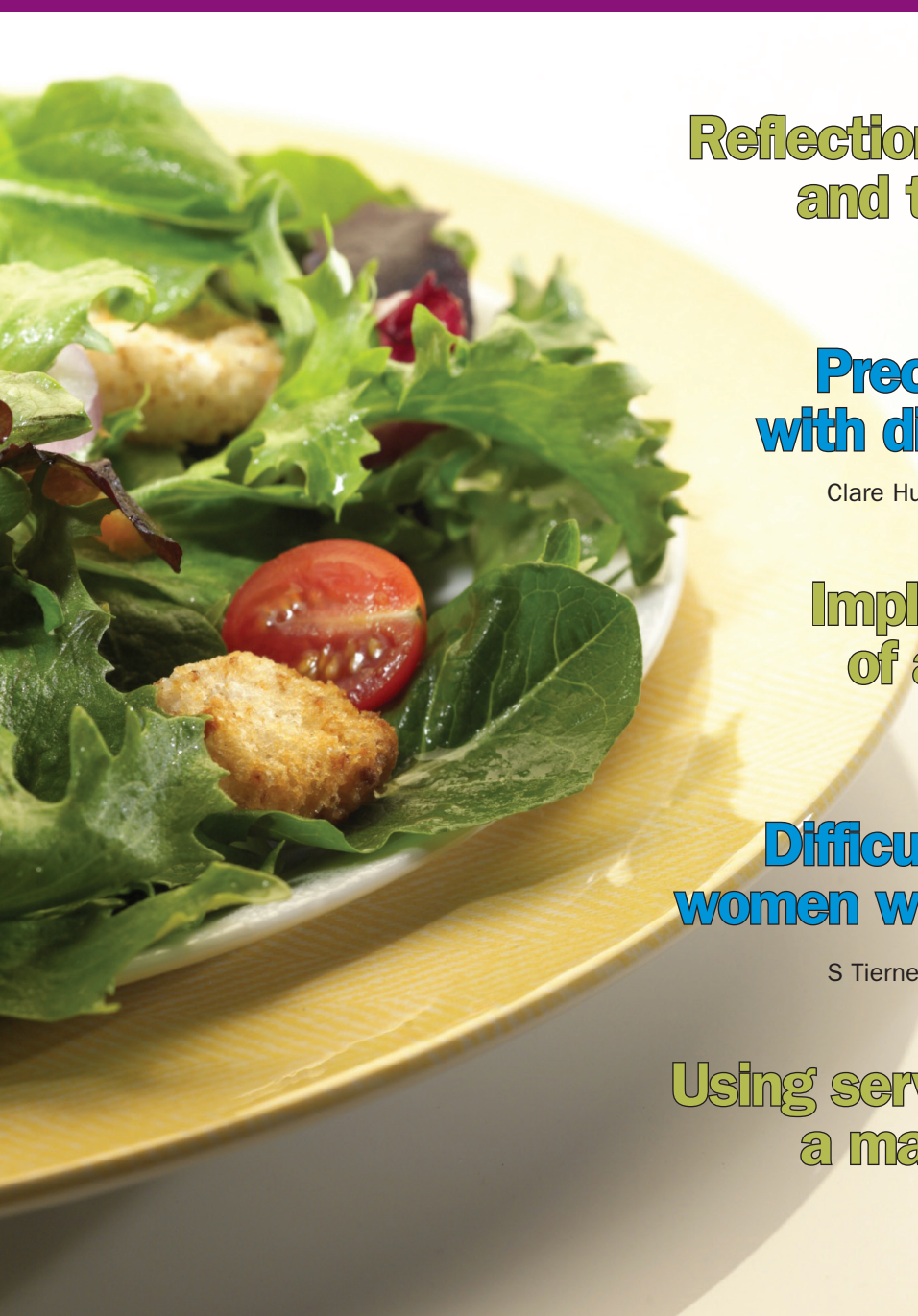


# MATERNAL OBESITY

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# Reflection on nutrition in pregnancy and the advice given to women

**D**iet varies throughout the world, depending greatly on the level of industrialization of a country and the foods available. Malnutrition is very common in lesser economically developed regions, although is still an issue in some lower income households in the UK. Usually, lack of food is not the problem in developed countries; it is the quality and type of diet that causes concern about the variety of nutrients being consumed. A 'western' diet, based on red and processed meat and increased fat from dairy products, has been associated with an increased risk of growth restriction to the fetus (Knudsen et al, 2008).

## Midwives' contribution to dietary advice

Pregnancy may be a life event leading to increased nutritional awareness that could influence women's future nutrition-related behaviours (Szwajcer et al, 2007). The National Institute of Health and Clinical Excellence (NICE) (2008) states that midwives have a direct role in, and responsibility for, the nutrition of pregnant women.

It is accepted that good diet and healthy lifestyle have a great impact on improving long-term health and health outcomes (Campbell and Campbell, 2005). This is especially true for women as research has shown that poor diet can increase the risk of post-menopausal cancer and osteoporosis (Cauley et al 1996; Lips 1997; Sellmeyer et al, 2001). The midwife holds a unique position in that she may be able to alter dietary habits, and encourage women's increasing awareness of nutrition, enabling her to improve the diet that

she provides for herself and her family.

Midwives make a substantial contribution to public health by working to promote the wellbeing and health of mothers and their babies. The Royal College of Midwives (RCM) (2001) asserts that all midwives should understand their roles as public health practitioners. Although nutrition has such an impact on long-term health, constrained by time and a need to provide a vast array of information during brief episodes of care, midwives may be unable to provide any dietary counselling over the bare minimum

## Women's diet

The latest National Diet and Nutrition Survey found that, while the majority of adults were adequately nourished in terms of calories, levels of Vitamins C and D, iron and folate were below optimum in women. The average daily consumption of fruit and vegetables was 2.9 portions a day for women; only 15% met the recommended 5 a day target. Mean daily consumption was lowest in the youngest group (women aged 19–24) consuming only 1.8 portions a day (Swan, 2004).

Midwives must consider the factors that influence a woman's diet. The biggest challenge to a change in diet is how to help women alter their behaviour rather than just their knowledge and attitudes to food (NICE, 2008). People generally know that one food option is healthier than another, yet still opt for a less nutritious diet. Positive nutritional support from a skilled and sensitive midwife throughout pregnancy can improve outcome (Worthington-Roberts and Rodwell Williams, 1989; Williamson, 2006). Realistically, the midwife has little time in which to provide a vast amount of information, however, with obesity becoming more of an issue in the UK, it is perhaps pertinent for them to consider offering more information on diet.

Humans have a complex relationship

with food. There are physiological, psychological, social and economic influences on the amount and type of food eaten. Midwives should accept that women eat different foods and that they may only consider some of the information offered to them to be important. However, as nutrition impacts on the outcome of pregnancy as well as long-term health, it seems that midwives should at least try to offer advice.

A health-conscious diet is associated with increasing education and age and non-white women. There is a negative association with increased parity, single and/or unemployed women, those who smoke and obese women (Northstone, et al 2008). The *Acheson Report* (Department of Health, 1998) found that women tend to have better diets than men but, in line with other findings, those from low income backgrounds have diets that fall below dietary reference values.

## Impact of poor nutrition

During pregnancy women may be more susceptible to taking up advice on diet and healthy lifestyle (Piirainen et al 2006; Szwajcer et al 2007). NICE (2008) suggests that professional bodies should ensure midwives have appropriate knowledge and skills to give advice on the nutritional needs of women and the importance of a balanced diet before, during and following pregnancy. Midwives should also know the rationale for recommending (or discouraging) certain dietary supplements to pregnant and breastfeeding women.

Rickets—a good clinical marker of poor pre- and postnatal bone health caused by a deficiency of Vitamin D—is re-emerging in the UK. Studies show that one quarter of British women aged 19–24 and one sixth aged 25–34 are at risk (NICE, 2008). More and more pregnant women enter pregnancy overweight as dietary habits deteriorate. In

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one study an increase in overweight women was accompanied by a 5-fold increase in gestational diabetes plus an unprecedented increase in the prevalence of larger babies (Henrikson, 2006).

Research indicates that impaired maternal nutrition may influence disease programming for the fetus in later life. This is associated with an increase in obesity, cardiovascular problems, high blood pressure and diabetes as well as growth restriction before birth and after (Thompson, 1999). As quality of diet declines in the UK, midwives must inform women of the risks associated with poor nutrition in pregnancy. Nutritional advice offers most benefit if diet is optimized before conception (NICE, 2008) but is also effective if change occurs before 12 weeks gestation. Studies show that fetal outcome is worse if the mother was malnourished at the time of conception rather than at the time of birth (Doyle et al, 1999).

### Guidelines for giving dietary advice

Pre-conception care is not a great priority is today's maternity services, where many women do not plan their pregnancies. The evidence surrounding nutrition should not be overlooked in preference for other subjects. Nutrition advice comes under the scope of normality and therefore women should receive helpful, broad information along with discussion about diet and eating healthily from midwives. While NICE antenatal guidelines (2008) encourage information-giving by midwives, specific directives are aimed at avoidance of certain foods owing to the risk of salmonella and listeriosis. Although the importance of this advice is recognized, this is not an adequate level of information.

Midwives should be encouraging women to eat a healthy, balanced diet as early in pregnancy as is possible. Acknowledging that some women come from low income households, cheaper foods and simple recipes could be discussed. If the evidence supporting a good diet was discussed with women, and if enough relevant information was offered to them in an accessible, informal manner, many more women may consider changing the way they eat. The midwife should never assume a woman has a particular level of knowledge about nutri-

tion based on their background or present circumstances. Although these factors may have bearing on level of knowledge, it is not acceptable to judge and stereotype the individual based on her circumstances.

The consequences of not giving enough information about diet can be startling. As discussed, poor diet can worsen pregnancy outcome and affects long-term health of both mother and the child. Nutrition is only one part of a healthy lifestyle but it is something that midwives can encourage to good effect owing to the responsibility the mother often feels towards the fetus (Swajcer, 1997).

### Adequate training for midwives

Pearson (1996) reviewed several studies on nutritional knowledge of pregnant women and health professionals and concluded that adequate training for midwives and consistent nutritional messages throughout pregnancy are vital in improving diet. Without midwives having sound knowledge of nutrition and how to make a healthy diet accessible to all, improving the way the nation eats will be difficult. Midwives are in the privileged position of having some influence over women for 9 months of their life; this influence should be used to benefit women, their children and therefore future generations.

Some may suggest that time constraints limit the information that midwives offer women. As diet deteriorates and related problems increase in the UK, midwives must become aware of the dangers of poor nutrition, to the mother and fetus, and of the benefits that counselling and support can bring.

**BJM**

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# Preconception care for women with diabetes: the midwife's role

By Clare Hughes, Dale Spence, Valerie A Holmes and Noleen K McCorry

## Abstract

**Diabetes mellitus is a chronic illness which affects a significant number of childbearing women. Despite the potential for adverse consequences for both maternal and fetal wellbeing, few women with diabetes plan their pregnancies to ensure that they enter pregnancy in optimal health. Furthermore, while adverse pregnancy outcomes are well documented for women with type I diabetes, it is now apparent that an increasing number of women with type II diabetes are becoming pregnant with similar adverse associated risk. There is an increasing recognition that significant adverse pregnancy outcomes are determined before a woman initiates pregnancy care, many of which could be minimized with the introduction of preconception care. As formalized preconception care clinics remain scant across the UK, there is an urgent need to increase the opportunities for the provision of preconception care and advice to women with diabetes. Midwives are ideally placed to provide preconception advice to women and could provide the missing link in terms of preconception advice for women with diabetes.**

**D**iabetes mellitus remains a condition which poses a significant threat in pregnancy to both the mother and unborn baby. Diabetes is the most common pre-existing medical condition to complicate pregnancy affecting approximately 1 in 250 women in the UK (Confidential Enquiry into Maternal and Child Health (CEMACH), 2007). While the overall number of women with type I diabetes has remained relatively constant, the number of women diagnosed with type II diabetes has increased considerably, partly owing to an increase in ethnic minority groups in the UK and partly to increasing levels of obesity in the general population (Baeten et al, 2001; Dornhurst, 2005; CEMACH, 2007). Despite the complexities associated with diabetes, there is significant evidence that improving glycaemic control before pregnancy can lead to a significant improvement in pregnancy outcome (Diabetes Control and Complications Trial (DCCT), 1996; Temple et al, 2002).

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This article presents an overview of recent literature on preconception care in pregnancy for women with pre-existing diabetes. The literature search included a search of MEDLINE; PsycINFO and Maternity and Infant care databases using 'pregnancy', 'diabetes', 'preconception' and 'midwife' as key search terms. Risks associated with pregnancy in women with pre-existing diabetes are explored, highlighting the importance of preconception care for women with diabetes. After consideration of the issues around seeking health advice, the significance of midwives embracing the provision of preconception advice as part of their health promoting role will be emphasized.

## Associated risks of diabetes in pregnancy

Recent findings from CEMACH (2007), focusing on diabetes in pregnancy, identified that women with diabetes continue to face considerably higher risk in many aspects of pregnancy when compared to women without diabetes. Perinatal mortality is four times higher; stillbirth rate is five times higher and malformation rate is double that of a pregnant woman without diabetes (CEMACH, 2007). Furthermore, maternal hyperglycaemia can lead to fetal hyperinsulinaemia which is associated with fetal macrosomia and neonatal hypoglycaemia (Dornhurst, 2005).

Poor glucose control in the critical weeks of organogenesis (5–8 weeks after the last menstrual period) is thought to be the key aetiological cause of both organ damage and early fetal loss in women with diabetes (Gabbe and Graves, 2003). In 1996, the findings of the landmark Diabetes Control and Complications Trial (DCCT) concluded that improving metabolic control before and around conception reduced the anomaly rates in the offspring of women with diabetes. It is now widely accepted that there is a clear association between pregnancy outcome and glycaemic control in early pregnancy (Temple et al, 2002), with one study reporting that even a slight elevation in the HbA1c level in early pregnancy significantly increases the risk of fetal malformation (Suhonen et al, 2000).

Women with diabetes are more likely to suffer hypertensive disorders of pregnancy, particularly pre-eclampsia where rates vary from 13 to 32.5% and increase with the complexity of diabetes (Manderson et al, 2000; Hsu et al, 1998; Hanson and Persson, 1998; Garner et al, 1990). Recent recommendations suggest that anti-hypertensive medications deemed safe for pregnancy should be provided sequentially for women until target blood pressure levels are achieved and careful monitoring should take place for the development of

**Box 1. Targets for pre-conception advice**

- Aim for HbA1c <6.1%
- 5 mg daily folic acid supplementation pre-conceptually to 12 weeks of gestation
- Diet, body weight and exercise advice for women with a body mass index (BMI) >27 kg/m<sup>2</sup>
- Review and possible change of the following medications:
  - Oral hypoglycaemic agents to insulin or possibly metformin
  - Antihypertensive medications
  - Statins (contraindicated in pregnancy)
- Retinopathy screening
- Kidney function screening

pre-eclampsia (Kitzmilller et al, 2008; National Institute for Health and Clinical Excellence (NICE), 2008).

Pregnancy can also have an adverse effect on the existing complications of diabetes such as retinopathy and nephropathy. The progression of retinopathy during pregnancy is significantly more common in women who have pre-existing diabetes for 10 years or more (Temple et al, 2001). Unfortunately, and contrary to desired expectation, there is an increased risk for progression of retinopathy where a woman has poor glycaemic control at the start of pregnancy but who makes a rapid improvement in glycaemic control (Temple et al, 2001; Gabbe and Graves, 2003; Kitzmilller et al, 2008). Despite this, in their recent 2008 guidelines NICE reiterate that diabetic retinopathy should not be considered a contraindication to rapid optimization of glycaemic control in women who present with a high HbA1c in pregnancy. Diabetic nephropathy is the single leading cause of end-stage renal disease and is also recognized as an indicator for cardiovascular disease in women with diabetes (Kitzmilller et al, 2008). Diabetic nephropathy in pregnancy is linked with increased risk of fetal growth restriction, pre-eclampsia, preterm delivery and stillbirth (Kitzmilller et al, 2008). While the prevalence of nephropathy during diabetic pregnancy is thought to be 5%–10% (Gabbe and Graves, 2003), optimizing both glucose and blood pressure control has been shown to significantly reduce the risk of the progression of nephropathy during pregnancy (Kitzmilller et al, 2008).

## Type II diabetes in pregnancy

While focus over the last few decades has been on the significant impact type I diabetes has on pregnancy, it is now recognized that type II diabetes carries identical risks of perinatal death (Clausen et al, 2005; Modder, 2006; MacIntosh et al, 2006). Indeed, studies have highlighted that type II diabetic pregnancies are characterized by poor pregnancy planning, inadequate folic acid supplementation and inappropriate medication management—all compounding factors towards adverse outcomes (Roland et al, 2005; Clausen et al, 2005; Modder, 2006). Women with type II diabetes tend to be older and more obese on entering pregnancy than their type I counterparts, both known risk factors in normoglycaemic women for stillbirth, hypertensive complications and congen-

ital malformation (Baeten et al, 2001; Clausen et al, 2005). Obesity and type II diabetes are both characterized by insulin resistance which is further aggravated during pregnancy and is thought to contribute towards increased perinatal mortality (Clausen et al, 2005). Of note, findings from a study in New Zealand by Gunton et al (2000) reported that while rates of uptake of preconception advice increased over time in women with type I diabetes, a downward trend was noted in women with type II diabetes. This highlights an area of real concern as, in some countries, the number of women with type II diabetes complicating pregnancy exceeds the number of women with type I diabetes (Slocum, 2007).

## Preconception care for women with diabetes

There is an increasing realization that many of the adverse pregnancy outcomes associated with pre-existing diabetes are determined before a woman initiates pregnancy care, for example: repeated miscarriages; medical complications; previous history of fetal growth restricted babies or prematurity (Moos, 2006). Development of the organs of the embryo (organogenesis) occurs from 3 days after the first missed menstrual period through to the end of the eighth week after fertilisation (Coad and Dunstall, 2001), hence, if the contributors to these adverse outcomes could be identified and targeted prior to this, the likelihood of improving pregnancy outcome could be significant (Moos, 2006).

Despite painting a somewhat gloomy picture of the impact of diabetes on pregnancy, it is important to stress that some of these effects could be minimized through the introduction of preconception care, particularly in relation to practical aspects of care (*Box 1*), although it is important to recognize that behavioural issues around seeking health care remain complex. Janz et al (1995) examined the differing characteristics associated with women seeking preconception advice and those who do not, and concluded that women seeking preconception advice were more likely to report that health professionals had mentioned preconception issues previously and encouraged them to seek advice. These women were also more likely to perceive positive benefits to preconception advice, have more knowledge and have greater social support. Women who do not plan pregnancies are less likely to alter risk-taking behaviours than those women who plan them (Hellerstedt et al, 1998). It is crucial that women with diabetes are made aware of the importance of pregnancy planning. Seeking appropriate health-care advice, such as preconception advice, is recognized as an important health behaviour, yet the majority of women with diabetes do not seek advice until after they are pregnant, when damage to the fetus may already have occurred (Arredondo and Zuniga, 2004).

## Seeking health advice

Several studies have explored the reasons for people not attending or seeking health advice. Lawson et al (2005) recognized that people with diabetes have diverse views in terms of their perceptions of vulnerability, control, fears, anxieties and strategies for coping. They suggest that health professionals

need to recognize that different approaches to care may be required in order to promote good diabetes self-management. They also suggest that, in some cases, providing information which may increase fear levels to promote self care may indeed be counter-productive.

In the CEMACH report on diabetes (2007) the major reasons identified for women not planning a pregnancy were related to behavioural and lifestyle issues, such as non-attendance at appointments, non-adherence to medicinal advice in relation to diabetes management, language difficulties and domestic circumstances. Other studies in relation to pregnancy planning suggest lower income women are less likely to plan or wish to plan their pregnancies (Moos et al, 1997; Family Planning Association, 1999; Barrett and Wellings, 2002). Kost et al (1998) suggest that intention status (whether the pregnancy is intended or unintended) is closely linked to pregnancy behaviour and suggest that disadvantaged social and demographic subgroups of women are less likely to engage in beneficial pregnancy behaviours, and that the groups least likely to carry out positive pregnancy behaviours are most likely to have unintended pregnancies.

Rao et al (2002) suggest that reasons why women may not initially seek preconception advice could be a lack of faith in health professionals, an ignorance of the services available or simply, and perhaps most worryingly, a state of 'inertia' (Rao et al, 2002: 615). Furthermore, the Diabetes and Pregnancy Group (2005) identified that women with type I diabetes had an inadequate knowledge of the risks of complications associated with pregnancy and about preconception care despite being seen at least three times per year by a diabetologist. This study identified gaps in information provided to women; women with a high level of education showed a good level of knowledge about preconception care but a low understanding of the complications associated with pregnancy and diabetes. Adolescents with diabetes have also been shown to have a lack of awareness of the risks of pregnancy-related complications with only 25% being aware of the importance of good blood sugar control in relation to pregnancy (Charron-Prochownik et al, 2006). Such evidence highlights the importance of ensuring that preconception care and advice focuses on both the how and the why with regard to pregnancy planning.

## Role of the midwife in preconception care

Currently, the majority of women with diabetes are referred to specialist antenatal services by either their GP or diabetologist early in pregnancy. Formalized preconception clinics remain scant across the UK (CEMACH, 2007) highlighting that this is a consistently difficult area to target. Furthermore, the statistics for unplanned pregnancy remain unacceptably high (CEMACH, 2007; Griffiths et al, 2008; Holing et al, 1998) and it is recognized that the social and emotional factors associated with unplanned pregnancy are complex and can occur among women of any age and social class (Holing et al, 1998; Simmonds and Likis, 2005; Griffiths et al, 2008).

Midwives are ideally placed to provide preconception care to women. They are the lead professional in normal

pregnancy, and preconception care facilitates the promotion and enhancement of normality. Indeed, preconception care has been described as the passport to providing positive health in pregnancy (Dunkley, 2000). Undoubtedly, the primary challenge for midwives is making preconception services generally available to women who have the potential for childbearing (Dunkley, 2000). If midwives fully embrace their role in the dissemination of preconception advice-giving and adopt innovative ways of promoting this role, it is conceivable that women will automatically trigger an association between the midwife and planning a pregnancy. By increasing awareness of the challenges facing women with diabetes, and indeed women with other medical conditions which have a significant impact on pregnancy, midwives will be challenged to provide consistent, up-to-date, accurate knowledge to women so that they may achieve a healthier outcome to their pregnancies.

The association of the midwife with planning a pregnancy may be promoted by the midwife being the first point of contact for women when they become pregnant. This is becoming increasingly recognized as a benchmark for good practice (Department of Health (DH), 2009). Although diabetes falls outside the remit of normality for the midwife, the Royal College of Midwives (RCM) highlight the responsibility of midwives to provide holistic support and maximise the role of continuity of care to women whose pregnancies are compromised (RCM, 2006). In addition, midwives could also embrace a more holistic multidisciplinary approach to care by communicating the advice that women with diabetes may need with regard to pregnancy planning to other health professionals, who may be accessing women and providing preconception advice.

Preconception advice-giving does not necessarily have to be formalized. The time on the postnatal ward provides the health-care team and, in particular, the midwife with important opportunities for health promotion advice, especially for women with diabetes with regard to future pregnancy planning. Recent government reports have recognized that empowerment and self-management are key to the management of chronic illnesses such as diabetes (DH, 2001a; 2001b; Diabetes UK, 2005). Early involvement with the multidisciplinary team, principally with the midwife, allows a trusting relationship to build and develop, where anxieties and concerns can be identified and discussed (Hughes, 2007).

## Future research and service needs

A recurring theme in studies to date is the need for further research and investigation into the area of preconception advice for women with diabetes. Holing et al (1998) highlight that unplanned pregnancy in women with diabetes remains a major problem. Griffiths et al (2008) emphasizes the need for tailoring advice for women living with diabetes to each woman's individualized need and particularly highlight the need for further research into the experience of type II diabetic women planning pregnancy. Temple et al (2006) suggest research should examine the view of poor clinic attendees to help determine how to engage those most at risk of poor outcomes and again highlight the need

for targeting preconception services towards women with type II diabetes. An important area of future exploration is that of women's attitudes towards pregnancy planning to try and identify how services could be better targeted to meet specific needs.

Unfortunately there remains very little information available to guide practitioners on how best to promote or introduce services of preconception care or advice. The majority of preconception advice is offered by either GPs in the primary care setting and by diabetes specialist nurses and diabetologists in the hospital setting. While many of these individual practitioners provide satisfactory advice, there is a need for consistency and centralizing of services so that women know exactly where to seek this important information. In addition, it is important to recognize that pregnancy remains a specialized area within diabetes care and not all general diabetes specialists necessarily carry the breadth of knowledge in relation to pregnancy that women may need and which a midwife can offer.

## Conclusion

The role of the midwife is ever expanding, challenging midwives to strive to be up-to-date with the most recent evidence. If midwives are to truly embrace their role as health promoters, more emphasis must be placed on their role in preconception care. While midwives demonstrate an awareness of the individual concepts with regard to preconception

advice, they need to embrace the concept that preconception advice is within their remit of care. It is also important to recognize their role in multidisciplinary support available to women with diabetes and to provide educational support to those professionals who may be providing preconception advice. If women associate midwives with the provision of preconception advice, this should ultimately trigger the association of the midwife as the first point of contact for pregnancy, thus promoting the concept of pregnancy as a normal, healthy process.

Clearer guidance is emerging to support advice giving, particularly to vulnerable groups such as women with diabetes (CEMACH, 2007; NICE, 2008). The evidence strongly highlights the significant improvements to pregnancy outcomes that preconception advice brings to women with diabetes, and thus it is crucial that in the future midwives equate this as part of their role. By fulfilling this role the midwife can act as 'the missing link' in terms of preconception care for women with diabetes.

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## Key Points

- **Diabetes remains a condition which poses a significant threat in pregnancy to both the mother and unborn fetus.**
- **Diabetes is the most common medical condition to complicate pregnancy affecting approximately 1 in 250 women in the UK.**
- **While focus over the years has been on type I diabetes having a significant impact on pregnancy, it is now recognized that type II diabetes carries identical risks of perinatal death.**
- **The primary challenge for midwives is making preconception services generally available to women who have the potential for childbearing.**
- **Midwives need to embrace the concept that preconception advice is within their remit of care.**
- **If women associate midwives with the provision of preconception advice, this could ultimately trigger the association of the midwife as the first point of contact for pregnancy, thus promoting the concept of pregnancy as a normal, healthy process.**

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# Implementation and evaluation of a nutritional screening tool

**N**utrition during pregnancy is an important aspect of antenatal care therefore the nutritional status of all pregnant women needs to be considered as part of the care pathway during pregnancy. Current antenatal practice does not involve nutritional screening but National Institute for Health and Clinical Excellence (NICE) guidelines (2008a) recommend review of lifestyle considerations, such as nutritional supplements, and outline recommendations for assessing weight during pregnancy. A nutritional screening tool will allow health professionals to identify those who are nutritionally at risk owing to poor eating habits or an abnormal body mass index (BMI).

In the UK there is currently no validated nutritional screening tool for use in pregnant women to identify women who are nutritionally at risk. As a result of this, the referral of pregnant women to dietetic services is inconsistent.

## Diet and pregnancy

Dietary links include weight gain during pregnancy and the weight of the unborn child (Susser, 1991; Neufeld et al, 2004), folic acid intake and the incidence of spinal cord defects (Lumley et al, 2001) and nutritionally inadequacy related to low-birth weight babies (Mathews et al, 1999). Not only can some of the nutritional problems cause problems at birth but they can also result in long-term health conditions for the infant, such as Spina Bifida. Maternal weight gain and fetal growth were measured by Neufeld et al (2004) who found in a sample of 200 pregnant women that there is a significant association between maternal weight during the first and second trimester and fetal femur and tibia length at 17 and 30 weeks gestation. Neufeld et al (2004) also found a significant association for the same sample of pregnant women for weight gain and infant length at birth. A Cochrane review undertaken by Lumley et al (2001) evaluated four randomized controlled trials on multivitamin supplementation. The primary outcome measure was major structural malformation of fetus/infant. An overall risk ratio of 0.28 supported the use of periconceptional folate supplementation to reduce the risk of neural tube defects. Further studies evaluating the nutritional adequacy during pregnancy found a positive asso-

## Abstract

The aim of this study was to implement and evaluate the use of a nutritional screening tool for pregnant women. The nutritional screening tool was piloted by seven midwives on between four and ten pregnant women to assess the tool's ease of use. On completion of the pilot the midwives completed a questionnaire about the use of the nutritional screening tool. The midwives were randomly selected and worked for an East Lancashire hospital.

The main study evaluated the diets of pregnant women. A random sample of 55 pregnant women was screened using the nutritional screening tool and their diets assessed using a validated food frequency questionnaire. The participants were recruited at the antenatal clinic. Dietary analysis was performed on the food frequency questionnaire data using Qbuilder.

The response from the pilot of the nutritional screening tool by the midwives was positive. The midwives rated the tool easy to use with a clear and simple format. The nutritional screening tool was not statistically validated but the tool had 100% sensitivity and 66% specificity.

ciation between birth weight and dietary intakes of vitamin C, E and folate, in a sample of 693 pregnant women (Matthews et al, 1999).

In addition to the dietary links, there are also nutrition-related problems in pregnancy, such as nausea and vomiting, heartburn, cravings and constipation. All these factors can either directly or indirectly affect the dietary intake of the pregnant woman and therefore affect her nutritional status.

## Assessment of diet during pregnancy

Previous studies have looked at the assessment of diet during pregnancy. One such study was carried out by the Avon Longitudinal Study of Parents and Children (ALSPAC) (Rogers et al, 1998). The ALSPAC team assessed the diets of 11 923 pregnant women at 32 weeks gestation, using a self-completion food frequency questionnaire. The completed food frequency questionnaire was then analysed to determine estimated daily nutrient intakes for comparison against reported nutrient intake for all women aged 16-64 years. The results found that approximate mean daily intakes of energy, iron, magnesium, potassium and folate fell below the reference nutrient intakes for this group of preg-

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*Over half the pregnant women in this study took a nutritional supplement*

nant women. However, the study does not report statistical significance so the difference between daily intake and reference nutrient intake cannot be determined and evaluated statistically. The results of the food frequency questionnaire (FFQ) were also compared with the results of the Dietary and Nutrition Survey of British Adults (Henderson et al, 2002), which found close comparison except for the following nutrients: sugar, calcium, folate and vitamin C. Again, no statistical difference tests were reported to conclude the significance of this data. The food frequency questionnaire used in this study was developed by the ALSPAC specifically for assessing the diets of pregnant women in the UK. The findings of this research is of importance owing to the large study size, however, the lack of statistical conclusions limits the data.

Research by Mouratidou et al (2006) also assessed the dietary intake of a population of pregnant women. The population in this study were 250 pregnant women of Caucasian ethnic origin, living in Northern England and their dietary intake was assessed between weeks 14 and 18 of pregnancy. The results of this study found that only small differences were observed between this population of women and other studies, but no tests of significance were reported. Validation of this FFQ was undertaken by comparison of the results of the FFQ against 24-hour dietary recalls. The results of this validation study found positive correlation for the majority of the nutrients, except protein, polyunsaturated fatty acids, cholesterol, starch and

alcohol. With respect to the micronutrients, negative correlation was found for sodium, potassium, calcium, selenium, iodine, retinol, vitamin B<sub>12</sub> and biotin. As the FFQ used in that particular study has been validated by further research (Mouratidou et al, 2006), it has been chosen as the FFQ of choice for this study evaluating the diets of pregnant women in Blackburn.

### Nutritional screening

As there is little research into developing a nutrition screening tool for pregnant women there is a lack of information about such screening tools. The screening tool chosen to use for this study has been selected for several reasons: it has been designed for the specific population (i.e. pregnant women); is of simple format; and owing to lack of nutritional screening tools for this population, it is the best resource available.

In order to ensure the nutritional screening tool is suitable for implementation within the trust, this study aims to address the requirements of a nutritional screening tool. This is to be done through piloting the tool and attempting to validate the tool. Jones (2004) states that in order to identify, evaluate and use an existing tool, or to develop a new tool, it should be based on already having defined the population for which the tool is required, and should address the outcome measures of interest. Choosing an existing tool, if available, is primarily based on practical and methodological issues. Practical considerations outlined by Jones (2004) are:

- The tool uses information that is feasible to collect
- The tool is presented in a format that is clear and simple to follow
- The tool allows a nutritional evaluation to be carried out within an achievable time scale.

These considerations have been taken into account and apply to the nutritional screening tool selected. Part 1 of this study aims to address these practical considerations as the nutritional screening tool will be piloted by a sample of midwives working for an East Lancashire Trust.

Jones (2004) has also produced guidelines for validating nutritional screening tools. Validity of a screening tool is the agreement between results of the nutritional screening tool and the true nutritional status of the subject. That is, does the tool measure what it is supposed to measure?

Three different types of validity exist:

- Content validity, which assesses the relevance and completeness of a tool's content, taking into consideration the suitability of the tool in relation to its intended purpose and usage. This

is usually assessed during development of the nutritional screening tool

- Construct validity, which is assessed on the developed tool, and which determines the degree to which a measure performs in accordance with theoretical expectations. In the case of this tool, it would be expected that the subjects assigned to different nutritional risk categories by the tool differ with respect to variables not used to construct the tool but known to influence nutritional risk during pregnancy
- Criterion validity, which is also assessed on the developed tool, and which is the comparison of the tool's assessment of nutrition status with that obtained using a gold standard procedure.

Design issues for performing a validity study include:

- Carrying out the study in the setting in which the tool will be used
- Subjects must be representative of the population for which the tool is intended
- Subjects must be selected at random.

Sensitivity of a screening tool is the proportion of true positives that are correctly identified by the test. In the case of a nutritional screening tool, it is the percentage of subjects identified as at nutritional risk by the tool.

Specificity of a screening tool is the proportion of true negative that are correctly identified by the test. In the case of a nutritional screening tool, it is the percentage of subjects identified as having adequate nutritional status and not at risk.

This study aimed to assess the ease of use and validity of a nutritional screening tool for pregnant women in the East Lancashire setting. Further objectives of the study were to assess the diets of a sample of pregnant women by use of a validated food frequency questionnaire and comparison of the dietary intake of pregnant women against the result of the nutritional screening tool. In addition to testing the validity of the nutritional screening tool, the tool's sensitivity and specificity was determined.

## Methods

The study was led by a qualified dietitian with data collection assistance from a nutrition support worker. Midwives working for an East Lancashire Trust were also involved in the study.

The nutritional screening tool was obtained with permission from Wolverhampton Sure Start. The food frequency questionnaire was obtained with permission from the ALSPAC study.

There were 2 parts to the study: part 1 involved midwives piloting the nutrition screening tool; part 2 involved the dietary analysis of pregnant

women. This data from the dietary analysis of pregnant women was used to associate dietary intake and the score obtained from the nutritional screening tool.

### Part 1: pilot of the nutritional screening tool by midwives

The study population were midwives working for an East Lancashire Trust. Ten midwives were invited to participate in the study and written informed consent was obtained from each of the midwives.

Each midwife was invited to pilot the nutritional screening tool on up to ten pregnant women. On completion of the pilot, the midwives answered a short questionnaire about the nutritional screening tool. The questions addressed the format of the tool, ease of use and the dietetic referral pathway.

### Part 2: evaluation of the diets of pregnant women

The study population was pregnant women attending the antenatal clinic at a hospital in East Lancashire. Fifty-five pregnant women were randomly selected from the antenatal clinic lists.

The inclusion criteria were all pregnant women attending antenatal clinic. The exclusion criteria were those unable to give informed consent, individuals with diabetes or other nutrition related

**Table 1. Midwifery questionnaire responses**

Question	Response	n (%)
Format of tool – easy and clear to understand	Very easy	7 (100)
Time to complete tool	Less than 5 minutes	6 (86)
	Between 5 and 10 minutes	1 (14)
	More than 10 minutes	0
Appropriateness of time to complete	Satisfactory	7 (100)
Was the tool used at booking	Yes	7 (100)
Used on all patients	Yes	6 (86)
	No	1 (14)
Scoring system – ease to use	Yes	7 (100)
Referral pathway – ease of understanding	Yes	7 (100)
Benefit of dietetic intervention based on the tool score	Yes	4 (57)
	No	1 (14)
	No answer	2 (29)



**Table 2. Characteristics of pregnant women**

<i>n</i> =55	Mean	Standard deviation	Range
Age (years)	28.60	6.3	16–45
Gestational age (weeks)	21.56	10.7	0–41
Screening score	3.18	1.982	0–9

**Table 3. Lifestyle parameters of the pregnant women (*n*=55)**

		<i>n</i>
Smoking status	Smoker	9
	Non smoker	46
Alcohol consumption	Drinks alcohol	8
	No alcohol	47
Exercise	Yes	38
Supplement usage	Yes	33
	No	22
Type of supplement	PregnaCare	10
	Folic acid	18
	Iron	7
	Vitamin D	1
	Calcium	2
More than 1 supplement taken		5

co-morbidities, such as coeliac disease. The ethnicity of the study group was not evaluated as part of this study.

Each pregnant woman was screened using the nutritional screening tool and also completed the interviewer-administered food frequency questionnaire. Sample questions from the FFQ are as follows:

- How many times do you eat cheese? Options: never or rarely/once in 2 weeks/1–3 times a week/4–7 times a week/more than once a day
- How many times do you eat fresh fruit? (Same options as above)
- What type of milk do you use? Options: yes usually/yes sometimes/no not at all (eight types of milk given).

### Dietary analysis

QBuilder 2.0 (Tinuviel Software) was used to analyse the FFQ. Approximate daily intakes were calculated from the FFQ data by multiplying the weekly frequency of consumption of a food by the nutrient content of a standard portion. Each

of the frequency options of the FFQ was mapped as follows:

- Never or rarely= 0
- Once a fortnight= 0.5
- 1–3 times a week= 2
- 4–7 times a week= 5.5
- More than once a day= 10.

### Statistical analysis

The Statistical Package for the Social Sciences (version 14) was used to analyse the data. The data was tested for normality before deciding upon suitable statistical tests. The following tests were used to statistically analyse the data:

- Descriptive tests, including means, standard deviation and ranges for both the FFQ and screening tool data
- Tests of normality, using Kolmogorov-Smirnov owing to the small sample size
- Parametric tests including the t-test to compare the means of nutrient intakes against dietary reference nutrient intakes
- Pearson's correlation coefficient to test association between nutrient intakes and reference nutrient intakes (RNIs)
- Pearson's correlation coefficient to test correlation between overall nutritional screening score and intake of specific nutrients
- Non-parametric tests including Spearman's rank coefficient to test association between nutrient intakes and RNIs.

### Ethical approval

Cumbria and Lancashire Research Ethics Committee approved this study. Research and development approval was granted by East Lancashire NHS Trust. All pregnant women and midwives gave written informed consent.

### Results

#### Study 1: pilot of the nutritional screening tool by midwives

Of the ten midwives invited to participate in the pilot of the nutritional screening tool, seven responded and gave written informed consent. The results of the midwives is shown in *Table 1*.

Of the 7 midwives who piloted the nutri-

**Table 4. Comparison of mean daily nutrient intakes against dietary reference values.**

	Mean daily nutrient intake	Dietary reference value	P-value (95% C.I)	
<b>Energy</b>	1777	2025	0.002	Significant
<b>Protein</b>	69.1	51	0.000	Significant
<b>Calcium</b>	752.1	705.5	0.246	Not significant
<b>Iron</b>	10.0	12.0	0.000	Significant
<b>Folate</b>	228	300	0.000	Significant

tional screening tool on pregnant women, only one midwife did not use the screening tool on all patients, the reason for this being unknown. Question 11 of the questionnaire asked the midwives to evaluate the benefit of dietetic intervention on those pregnant women who were identified as being at risk and warranted dietetic referral. One midwife reported no perceived benefit but the reason for this was not given.

### Study 2: validation of the nutritional screening tool

A target sample size of 50 pregnant women was identified; however, owing to additional data collection time being available, 55 pregnant women undertook this part of the study. Characteristics of the 55 pregnant women who participated in the study are shown in *Tables 2 and 3*. The mean nutritional screening score of the 55 pregnant women was 3.18, which means that the study population, on average, would not be highlighted by the nutritional screening tool as being at nutritional risk during pregnancy.

Of the 55 pregnant women who participated, 9 smoked and 8 drank alcohol. Both these factors may affect the dietary intakes of these women and therefore influence the results of the study. More than half of the study population were also taking a nutritional supplement which may have influenced the overall results of the study. Smoking, alcohol consumption and nutritional supplement

**Table 5. Nutritional screening score (n=55)**

Score	n
0	5
1	5
2	11
3	12
4	10
5	6
6	3
7	1
8	1
9	1

use by the pregnant women could alter the results of the study as these factors all impact on nutritional intake.

### Dietary analysis

Dietary reference values for key nutrients in pregnancy were used to compare the dietary intakes of this population of pregnant women. The dietary reference values were obtained from the Department of Health (1991). Dietary reference values reflect the nutritional needs of a particular population and provide a standard for which the nutritional adequacy of diets can be assessed.

**Table 6. Correlation between mean daily nutrient intakes and particular screening tool questions**

	Nutrient	r-value	P-value	
<b>Question 1</b>	Energy (calories)	-0.295	0.029 (95%)	Significant
<b>Question 2</b>	Calcium	-0.222	0.104	Not significant
<b>Question 3</b>	Vitamin C	-0.227	0.095	Not significant
<b>Question 4</b>	Protein	-0.417	0.002 (99%)	Significant
	Iron	-0.327	0.015 (95%)	Significant

**Table 8. Sensitivity and specificity of the nutritional screening tool**

FFQ analysis	Nutritional screening score	
	No risk	Risk
No Risk	10	0
Risk	5	2
Total	15	2
Sensitivity = $2/2 = 100\%$		
Specificity = $10/15 = 66\%$		

Table 4 shows the comparison of mean daily nutrient intakes and dietary reference values found that energy, protein, iron and folate intakes of the study population are significantly different; energy, iron and folate intakes being significantly lower than dietary reference values. Only calcium intakes were not significantly different to dietary reference values.

#### Nutritional screening score

Table 5 shows the numbers of pregnant women for each overall score obtained by the nutritional screening tool and score 3 having the highest number.

The nutritional screening tool questions aim to address specific aspects of the diet, thus, allowing comparison of the score from these individual questions and the dietary analysis of the study population diets. The results of this are shown in Table 6.

#### Significant

The following outlines the questions of the screening tool and the nutrient of concern:

- Question 1: How many meals do you eat most days? (Calorie intake)
- Question 2: How many portions of dairy products do you eat most days? (Calcium intake)
- Question 3: How many portions of fruits and vegetables do you eat most days? (Vitamin C intake)
- Question 4: How often do you eat meat, chicken, fish, eggs or pulses? (Protein and iron intake).

The study found a significant relationship between the intake of calories and the score obtained in question 1, and the intake of protein and iron and the score for question 4.

The dietary intakes of the pregnant women were classified into risk categories to allow comparison of dietary intakes against the nutritional risk score:

- Risk score 1= mean dietary intakes did meet RNIs
- Risk score 2= some but not all mean dietary intakes did not meet RNIs

- Risk score 3= mean dietary intakes did not meet RNIs.

The value of Kappa ( $-0.037$ ,  $p=0.698$ ) suggests there is no agreement between the two methods of identifying nutritional risk. The study has not statistically validated the nutritional screening tool. However, it is concluded that even though the nutritional screening tool has not been validated, the tool is sensitive with a good degree of specificity (Table 8).

#### Discussion

The aim of this research was to pilot the nutritional screening tool for pregnant women and attempt to validate it against data collected from the dietary analysis of a food frequency questionnaire performed on a random sample of pregnant women.

The results from the pilot of the nutritional screening tool were positive and the response to the introduction of such a nutritional screening tool did not highlight any potential barriers. As no reasons were given by the three midwives who failed to return their questionnaire, no conclusion can be made about the potential negative responses.

No previously published studies have been identified that validate a nutritional screening tool for this target population, pregnant women. However, there are numerous validation studies for other nutritional screening tools for different target populations. The greatest challenge for validating nutritional screening tools is the lack of a gold standard for nutritional status. There is no biological marker which can define nutritional status.

As no previous studies have validated a nutritional screening tool for pregnant women, there is no data on the nutritional status of pregnant women. There is a wealth of data and studies evaluating the diets of pregnant women against dietary reference values, but no definition of nutritional status and classification of the data into nutritional intake patterns, for example, those at nutritional risk. As a result of this lack of previous studies, risk categories have had to be defined by the researcher. This creates a certain degree of error, as the categories are subjective to the researcher. The value of kappa suggests that there is no agreement between the two methods of identifying nutritional risk i.e. food frequency questionnaire and the nutritional screening tool. From this it can be concluded that this research has not statistically validated the nutritional screening tool.

It can be concluded the nutritional screening tool has a sensitivity of 100%, meaning the tool can identify correctly all those pregnant women



who are nutritionally at risk and a specificity of 66%, meaning that the tool identifies those pregnant women who are not at risk. Therefore, even though the nutritional screening tool has not been successfully validated using this methodology, it can be concluded that the tool is sensitive with a good degree of specificity. The results of the sensitivity and specificity of the tool do differ from the results of the Cohen kappa statistic. However, this can be explained because the sensitivity and specificity test was only applied to the tool and there may be discrepancies between the answers given to the tool's questions and the answers given to the food frequency questionnaire. The nutritional screening tool questions are quite general in terms of the type of food in question, whereas the food frequency questionnaire is more specific about the different types of foods and respondents are less likely to answer dishonestly.

The results of the sensitivity and specificity tests and Cohen's kappa may also be affected by the small sample size used. As the proportion of pregnant women identified by the tool as at risk was relatively small, this may have also contributed to the difference in test results. No clinical or statistical significance can be concluded with regards to the validation of the nutritional screening tool by the questionnaire. However, as the tool is the only currently available screening tool for pregnant women, its implementation within the trust will be valuable.

The tool can accurately identify those individuals who are at nutritional risk during pregnancy. This means that pregnant women who require dietetic intervention will have their care needs met.

With the ever-increasing diversity of the population, particularly in terms of nutritional status, the identification of individuals who may be nutritionally compromised is difficult. The existence of a suitable nutritional screening tool for pregnant women will help midwives in addressing the needs of their patients and provide a standard for assessing nutritional risk in this specific population. This, in turn, will standardise care across the population group.

## Conclusion

Despite the study results not statistically validating the nutritional screening tool using the method outlined, the nutritional screening tool is valuable for use in the antenatal care of pregnant women. Future work on the validation of the nutritional screening tool could possibly look at the cut-off points for the scoring system and evaluating the referral score to address the sensitivity and specificity of the tool.

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## Key points

- Most midwives completed the nutritional screening tool in less than 5 minutes.
- All midwives rated the nutritional screening tool as very easy in terms of being clear and simple to follow.
- Over half of midwives responded 'yes' to whether they felt that women who were referred to the dietitian would benefit from dietary intervention.
- Many pregnant women take a nutritional supplement.
- The mean daily intakes of calcium of these participants does not statistically differ from the dietary reference value.
- The mean daily intakes of energy, protein, iron and folate of these participants differ significantly from the dietary reference values
- Only 3 out of the 55 pregnant women in the study scored above 7 on the nutritional screening tool and were referred to a dietitian.
- The nutritional screening tool has a sensitivity of 100% and a specificity of 66%, but the tool was not statistically validated.

# Difficulties in recruiting pregnant women with eating or weight issues

The term 'eating disorders' (EDs) encompasses several complaints characterized by an excessive concern with shape, weight and food (Bryant-Waugh and Lask, 1995). These conditions generally affect females of childbearing age (Fairburn and Harrison, 2003). Consequently, EDs are possible during pregnancy. In a large, UK-based, community cohort study, almost 4% of the 12 254 pregnant women involved were reported to have a history of an ED, mainly of a bulimic type (Micali et al, 2007). For individuals with anorexia nervosa (AN), fertility may be compromised because of low body weight. In contrast, those with bulimia nervosa (BN) appear to have fewer problems conceiving, even though they often have menstrual irregularities (Ward, 2008). A change in shape with pregnancy may aggravate ED symptoms but this life event can ameliorate such difficulties (Patel et al, 2002), as a woman improves her behaviour for fear of the adverse impact it may have on her unborn child. Nevertheless, some women continue to have anxieties about their weight and engage in practices such as dieting, laxative abuse, over-exercising and self-induced vomiting when pregnant (Micali et al, 2007). Evidence suggests that having an active ED while pregnant can bring negative outcomes for the mother and child (Lacey and Smith, 1987; Ward, 2008), including miscarriage, low birth weight, congenital malformations and postnatal depression.

Obesity during pregnancy can be similarly challenging. Obese women are at an increased risk of developing gestational diabetes, pre-eclampsia and macrosomic babies at birth, which may lead to caesarean section (Baeten et al, 2001). The incidence of preterm birth is also higher among this group (Nohr et al, 2007). In the USA, data from the Pregnancy Risk Assessment Monitoring System across 26 states indicates that almost a fifth of women who gave birth in 2004–2005 were obese (Chu et al, 2009). Data from a representative sample of deliveries in England, between 1989 and 2007, suggested a doubling of maternal obesity from 8%–16% over this time period (while cases of women with a Body Mass Index (BMI) of <18.5 fluctuated around the 5% figure (Heslehurst et al, 2010). This finding is unsurprising given that 24.4% of adult women

## Abstract

During pregnancy, the eating behaviour and body of childbearing women can become open to public scrutiny. It is important to gather the views of those who are pregnant and have an eating/weight issue to ensure that maternity services meet their needs and to reduce any stress and discomfort they may endure. However, prompting women to engage in research that would explore these issues in depth can prove difficult. This article outlines the experiences of a team of investigators who have tried to examine the phenomena of pregnancy among women who have an eating disorder or who are classed as obese. It focuses on the obstacles encountered while undertaking two qualitative projects and outlines lessons learnt from this work, which may prove helpful to others wishing to study these areas.

were estimated to be obese in England in 2007 (Health Improvement Analytical Team, 2009).

## Aims of the paper

The outline presented above highlights that women with an ED or who are obese are important groups for health professionals to monitor and assist, and for researchers to study. However, recruiting them to investigations can be problematic. This article provides a commentary on the authors' experiences of trying to find individuals to take part in two separate studies. Although EDs are a mental health problem, whereas obesity is not classed as such, both these projects focused on reaching people identified as eligible to participate because of issues relating to their eating/weight. From the outset it was anticipated that recruitment to these two investigations would be difficult owing to the stigma associated with such conditions. However, the authors believed that these were important areas to examine to ensure that women received appropriate care and that their needs were met by midwives. The article begins with a brief overview of what is known about recruitment and retention from the general EDs and obesity literature, followed by a description of the authors' endeavours to interview pregnant women with eating/weight issues. It will close by considering the implications of their experiences, which may be of use to others planning similar work in this area. The article's primary objective is to share prob-

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lems encountered when executing two separate projects targeting specific pregnant women, with eating/weight issues.

### An overview of recruitment issues in ED/obesity research

Previous authors have detailed the difficulties of recruiting and maintaining within studies individuals who have an ED (who are not pregnant), which can have an impact on the generalizability of findings (Moss and von Ranson, 2006). This is unsurprising given that withdrawal from

services appears common among this population (Button, et al, 1997; Kahn and Pike, 2001; Zeeck, 2005); average dropout from treatment for BN and AN has been estimated as high as 30% and 50% respectively (Mahon, 2000). Explanations for dropping out of treatment include:

- The valued nature of some aspects of EDs (e.g. control, low weight) (Vitousek et al, 1998)
- A sense of not making progress
- Dislike at disclosing personal information during therapy (Mahon, 2000)
- Concerns about a loss of control over behaviours
- Being unhappy about physical changes (e.g. weight gain) (Eivors et al, 2003).

People with an ED declining to participate in treatment may differ to those who do engage with services (Welch and Fairburn, 1994; Bell, 2003). For example, in a project conducted by Fairburn et al (1996), people with BN seeking professional care had a more severe condition and greater impairment in social functioning than those who did not. Likewise, in an investigation by Telch and Stice (1998), lower rates of comorbid psychiatric disorders were found in women with binge eating disorder (BED) who did not seek professional care. Wilfley et al (2001), exploring clinic and community participants with BED, also found the former had a more severe condition, but did not note any difference between the two groups in terms of comorbid complaints.

In one paper describing ED treatment studies, differences were reported in recruitment rates between those with BN and those with AN. For the latter, recruitment peaked during year two and then decreased to almost zero within year three, while for those with BN recruitment rates remained relatively consistent (McDermott et al, 2004). The authors had to change their recruitment goals because of the high number of withdrawals among those with AN; initially, women had to be amenorrheic to be included, a criterion that was dropped part way through to increase the pool of potential participants.

Those conducting EDs research often employ a range of recruitment routes to meet their sample requirements, including clinical services, schools, local media (radio and newspapers), flyers and advertisements in public locations (e.g. libraries) (Hewell et al, 2006). In addition, websites of organizations and ED information portals may be targeted (McDermott et al, 2004). In a study focused on childbearing women with an ED, gyms, supermarkets and sports centres were used as outlets for recruitment, although most participants were identified through NHS services (e.g. GP surgeries and antenatal clinics) (Stapleton et al, 2008).



*Some women continue to feel anxious about weight gain in pregnancy and over exercise*



Studies with obese individuals have not specifically highlighted difficulties with recruitment and maintaining participation. Research exploring the experiences of this group has successfully employed various strategies to recruit participants including advertisements inviting volunteers using local media (e.g. newspapers) (Merrill and Grassley, 2008; Thomas et al, 2008). Sending study invitation letters to those meeting appropriate inclusion criteria, based on their health records, has also been employed (Brown et al, 2006). Of the few intervention studies published to manage excessive weight gain in pregnancy with obese women, developing health problems such as gestational diabetes and preterm births have affected maintenance of study group numbers (Kinnunen et al, 2007; Asbee et al, 2009). Unacceptability of the randomization process may be another reason for withdrawal (Wolff et al, 2008).

The preceding overview has detailed some issues associated with recruiting to studies on the topics of ED and obesity. The next section discusses attempts to recruit to two projects focused on exploring the views of women with eating and/or weight issues about pregnancy experiences.

### Recruiting pregnant women with eating/weight issues to exploratory studies

A team of researchers from Manchester composed of individuals with an interest in EDs and midwifery specialists, embarked on a qualitative study looking at the experiences and views of pregnant women with an active or a history of an ED (results from which are being written up for publication). The initial intention was to recruit via a large acute hospital trust with approximately 10 500 births each year. Midwives were asked to give to all women coming to clinic 16 weeks or more into their pregnancy a letter outlining the study and a brief screening questionnaire. Women interested in taking part in a qualitative interview, who felt they had an eating problem, were invited to complete the questionnaire and to return it in a prepaid envelope. They were then contacted by one of the investigators to take part in an interview if identified as having a difficulty in this area via the screening questionnaire. The questionnaire consisted of two short tools, developed for use in general practice to spot potential EDs: the SCOFF (Morgan et al, 1999) and the Eating Disorder Screen for Primary Care (ESP) (Cotton et al, 2003).

Unfortunately, returns from this recruitment route were poor. In total, 28 women sent back a questionnaire, but only six had an eating problem

as suggested by their screening scores. This was 1.4% of the total number of women given a research pack ( $n=420$ ). Three of these six individuals could not be contacted. Attempts were made to speak to them via the mobile phone number they had supplied, without success. Another appeared keen to take part but cancelled one appointment, was not at home for the second and then failed to attend a scheduled time at a private university office to be interviewed. It was suggested by midwives that putting the onus on women to complete and return recruitment information from home could have been a barrier to some individuals' participation, even though a prepaid envelope was provided for this purpose. Midwives at the study site noted that they often struggled to obtain other paperwork from women (e.g. health in pregnancy grant information). Limited funding meant members of the research team were unable to maintain a regular presence at the study site to remind midwives about the project. In addition, the antenatal clinic manager retired during the project, which meant there was some degree of change and pressure on practitioners at the point of recruitment.

Owing to the lack of participants recruited via the method outlined above, the authors set out to find additional interviewees by posting information about the project on a national EDs organization's website (B-eat: [www.b-eat.co.uk/Home](http://www.b-eat.co.uk/Home)). This resulted in eight women contacting the research team expressing an interest and six further interviews being completed. Because of the geographical area covered by those who were recruited by this source, telephone interviews had to be conducted with five participants. Following data collection, these individuals were asked about their experiences of taking part in a telephone interview. Responses were positive, with women stating that they had liked the anonymity, as the following comments from two different interviewees highlight:

*'...if I'm honest I think I would have found it harder face to face because of the anticipation of the interview, anxiety levels probably would have been higher and I'd have been more likely to forget things ... Because I was on the phone I was able to feel more at ease and able to posture myself comfortably, sitting on my bed rather than on an uncomfortable chair.'*

*'I think the telephone interview worked well. I had initially thought it would*

“ Verbal discussions with clinic staff indicated that certain women said they were aware of being obese, or “fat” ... but did not want to talk about this. ”

*be much harder than face to face but in some ways it possibly was easier to be honest with someone “anonymous”. Sometimes it can be difficult to speak to someone face to face about something that I am ashamed of.’*

Specialist ED programmes were considered as an additional recruitment outlet for this work. However, personal communication with two such local services (one private, another NHS) suggested that relatively few women seen for treatment at these locations were pregnant.

### Obesity and pregnancy

Difficulties were experienced recruiting to a qualitative study that aimed to explore the psychosocial experiences of being obese and pregnant (Furber and McGowan, 2010). The study sample, recruited from an acute (hospital) trust in the north west of England, included obese women (BMI >35), pregnant with a singleton fetus, who could speak English fluently. Data were collected using face-to-face, semi-structured interviews in the third trimester of pregnancy and again shortly after the birth. Because of the higher risk of developing gestational diabetes when pregnant and obese (Joy et al, 2009), women in this category at the study site were offered serum glucose screening at 28 weeks of pregnancy. During attendance for serum glucose assessment, women who met the inclusion criteria were provided with written material about the study by the health professional in attendance. This information included a letter outlining the study and participants’ involvement if they agreed to take part, and a form to complete and return to the researcher with their contact details.

The study’s access and recruitment procedures were designed after consultation with the antenatal clinic manager. Each weekly clinic was managed by healthcare assistants who were provided with information about the research. They also attended a workshop where they were

trained in communication techniques suitable for introducing the study to potential participants. There were some changes to clinical staff during the course of the study, which meant that those who were originally involved in developing the study’s access and recruitment procedures were not always available. Nevertheless, the researcher maintained regular contact with staff to offer support in approaching women about the study and to maintain interest in this work.

Recruitment was slow, beginning in early November 2007 and ending in August 2008. During this period, 57 women received information about the study, 26 returned a form to the research team and 19 were subsequently recruited. Seventeen women were interviewed twice (before the birth and afterwards), one was interviewed after the birth only (this woman had a preterm birth and was initially contacted after the birth, but still wanted to take part) and another only interviewed in pregnancy (this woman could not be contacted after the birth). Of the seven women who did not take part but returned forms with their contact details, three declined to participate after discussion with the researcher and four provided telephone numbers that were unobtainable or not answered.

Discussions with healthcare assistants managing the screening tests indicated that many pregnant women who were obese were not happy to take away information about the study. In fact, some felt negatively about the research and were not keen to read further. Verbal discussions with clinic staff indicated that certain women said they were aware of being obese, or ‘fat’ as was often quoted, but did not want to talk about this. The unenthusiastic reception frequently received meant that healthcare assistants were reluctant to approach women.

### Discussion

Nutritional factors in pregnancy have undergone a wealth of exploration (Cox and Phelan, 2008; National Institute for Health and Clinical Excellence (NICE), 2008). In contrast, in-depth investigation of the experiences and views of women who are pregnant and have some degree of problematic eating is limited. As this article suggests, accessing these individuals to participate in research can be difficult. Women may be reluctant to contribute to such projects because of the stigma associated with EDs (Crisp, 2005; Stewart et al, 2008) and obesity (Friedman et al, 2008; Puhl and Heuer, 2009).

People with an ED may be secretive about or strive to conceal their behaviours (Weaver et al,

2005; Pettersen et al, 2008). When pregnant, they may refrain from opening up to health professionals because of a concern about being labelled as a risk to the child and social services becoming involved (Stapleton, 2007). Perfectionist tendencies associated with those who have such conditions (Cassin and von Ranson, 2005) may also hinder them from coming forward for fear of being negatively perceived by others and having to admit to potentially harmful behaviours. Shame has been noted to play a role in onset and maintenance of EDs (Goss and Gilbert, 2002). Individuals with such conditions are said to evaluate themselves as flawed, inadequate and inferior, believing that others perceive them as worthless, resulting in a heightened sense of rejection (Goss and Allan, 2009).

For those who are obese, being reminded of this fact by taking part in a study may act as a barrier to their involvement (Furber and McGowan, 2010). A fear of being judged by others for their eating and body shape may also be an obstacle. Taking part in an interview is possibly more threatening to women than completing a questionnaire because of the interaction and direct contact experienced with another person and concerns that the investigator may show disapproval and see them in a negative light because of their behaviours and/or physical status.

Certain practical issues transpired during data collection. For example, in some cases, even though individuals had provided their mobile phone number they could not be contacted. This may have been because of second thoughts about participation, especially if experiencing negative feelings associated with pregnancy (e.g. sickness, fatigue, stress, depression), or because the researcher's office number was displayed as a private number on their phone screen when a call was made. In addition, cultural behaviours in some groups can mean they commonly change SIM cards, making contact difficult (personal communication with midwives). In a study of poverty and pregnancy, Hunt (2004) found participants were hard to get hold of owing to phones being cut off or frequent changing of numbers.

In both investigations described above, researchers relied on the goodwill of midwives. Although these professionals showed a readiness to assist, staffing levels and absences may have meant distribution of research packs was low down in practitioners' priorities. Consequently, information may not have been given out as requested, especially if time with a pregnant woman was short. Clinic staff may not have appreciated the potential benefits of findings from the

investigations to their practice, feeling removed from the research and its relevance to their day-to-day role. In the ED project specifically, the midwives working with teenagers appeared to be particularly good at giving out packs, perhaps because they saw such conditions as a risk to their client group, although evidence suggests older women can also experience EDs (Cumella and Kelly, 2008; Scholtz et al, 2010).

### Lessons learnt

The authors have learnt the following from their endeavours to recruit to the two projects described above. It is hoped others considering research on similar topics will find this helpful:

- We may have had better success in recruiting if we had acquired funding to employ a researcher to focus on this task, who could remind staff about the project, could ensure that information was given to eligible women and who was on hand to talk to any potential participants about the study; women may have appreciated having someone connected to the research at clinic to speak to, rather than receiving a letter inviting them to take part. This may have been welcomed by health professionals who are already busy with clinical work; having to remember to talk to women about research studies may encroach on practitioners' primary caring role
- Women need to be asked to take part in research that broaches potentially sensitive topics at an appropriate time. Their first appointment at an antenatal clinic is a moment when they receive a wide range of written materials. Study information is at risk of being lost amid other paperwork. This may go some way to explaining the poor uptake in the ED investigation. Likewise, in the obesity project, women were asked when they came for serum glucose screening if they wished to take part. Undergoing such a procedure may be stressful enough, without being invited to participate in a piece of research at the same appointment
- The use of language may have had an impact on whether individuals were motivated to read about the projects. To overcome concerns women may have had about being negatively judged because of their eating/weight, participant information sheets may have benefited from addressing these anxieties in greater depth and from re-emphasizing that people would not be negatively evaluated by investigators for what they said as part of the research. It is important that sensitive words are used when communicating to women about research related to EDs

and obesity. For some women, their perceptions of their body image when pregnant may be distressing (Lavender, 2007). Being asked to take part in a research study that relates to their feelings about their size and weight may compound such concerns.

## Conclusion

Obtaining the views of pregnant women who have eating/weight issues is important to bring to light the difficulties and challenges they face and to ensure that services are tailored to meet their specific needs. However, recruiting such women may be hindered by characteristics associated with their particular eating issue and/or concerns about stigma. Obstacles faced by researchers who have tried to conduct such investigations on this topic have been highlighted. It is hoped that what has been learnt from these endeavours and shared in this article will prove helpful to others embarking on similar work.

**BJM**

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## Key points

- Recruitment to studies asking women to talk about their experiences of being pregnant with some form of eating/weight issue can be difficult.
- The potentially sensitive nature of this topic means investigators have to think carefully about approaching women to take part.
- The authors have learnt a number of lessons from their experiences of trying to conduct qualitative projects in this area, which may be helpful to others considering similar projects.

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# Using service-users' views to design a maternal obesity intervention

Obesity is a global problem and almost a quarter (22%) of pregnant women are expected to be classified as obese with a body mass index (BMI) over 30 in 2010 (Heslehurst et al, 2007). The prevalence of obesity in pregnancy has increased from 9–10% in the early 1990s to 16–19% in the 2000s (Kanagalingam et al, 2005; Heslehurst et al, 2007). By 2050, half the UK female population is predicted to be obese (Foresight, 2007).

Obesity in pregnancy is associated with an increased risk of medical complications such as pre-eclampsia, gestational diabetes, stillbirth and neonatal death (Sehire et al, 2001; Cedergren et al, 2004; Kristensen et al, 2005; Chu et al, 2007). Saving Mothers' Lives, published in 2007 by the Confidential Enquiry into Maternal and Child Health (CEMACH), found that 27% of the women who died from direct or indirect causes during pregnancy and childbirth were obese (Lewis, 2007). Maternal obesity is also a major risk factor for the development of childhood obesity.

Maternal obesity has become one of the most commonly occurring risk factors in obstetric practice. The National Institute for Health and Clinical Excellence (NICE) published guidance on maternal and child nutrition (NICE, 2008a) and antenatal care (NICE, 2008b) both of which provide evidence and recommendations for preventing and managing maternal obesity. Furthermore, the Centre for Maternal and Child Enquiries/Royal College of Obstetricians and gynaecologists (CMACE/RCOG) (Modder and Fitzsimons, 2010) joint guidelines provide key recommendations for the management of maternal obesity from pre-conception to post-partum. The guidelines, however, do not address areas such as gestational weight gain, dietary and exercise advice and postnatal contraception.

At a local level, Primary Care Trusts (PCTs) are expected to commission or develop services that assist with the identification and treatment of pregnant obese women.

While specific maternal obesity targets do not exist, a number of related public service agreement targets would benefit from interventions directed at reducing the prevalence of maternal

## Abstract

Obesity is increasingly a matter of concern in the general population, but maternal obesity has received limited emphasis compared to adult and childhood obesity. In addition there is a lack of evidence regarding service users' views.

A qualitative study was conducted to identify and understand the health-care needs of service users in Lambeth in south-east London. Semi-structured interviews were conducted with six obese pregnant women and three obese women trying to conceive.

The lack of awareness of obesity as well as the lack of existing services was acknowledged. The need to develop and implement evidence-based care pathways which focus on improving the identification and management of obesity and include a community-based multi-component, and culturally sensitive intervention was recommended.

This feasibility study has highlighted key issues raised by women given the limited evidence of effectiveness around interventions for this target group.

obesity; such as reducing the childhood obesity rate, increasing breastfeeding initiation rates, and reducing health inequalities to tackle infant mortality by optimising maternal nutrition.

Despite the plethora of literature on the effects of obesity on fertility, pregnancy, birth and the postnatal period, there is virtually no information about obese pregnant women's views. Specifically there was none for the Lambeth area, which is a London borough. This is of importance as Lambeth's population may be at higher risk of obesity—it is a deprived, ethnically diverse, and relatively young (and fertile) borough (Figure 1).

## Background

### Measuring obesity

Maternal obesity is measured using the standard BMI classification related to the woman's pre-pregnancy weight, or BMI at booking. BMI is calculated by the following formula:  $BMI = \text{weight (kg)} / \text{height (m}^2\text{)}$ . There are three different classes of obesity (NICE, 2006):

- BMI 30.0–34.9 (Class 1)
- BMI 35.0–39.9 (Class 2)
- BMI 40 and over (Class 3 or morbid obesity).

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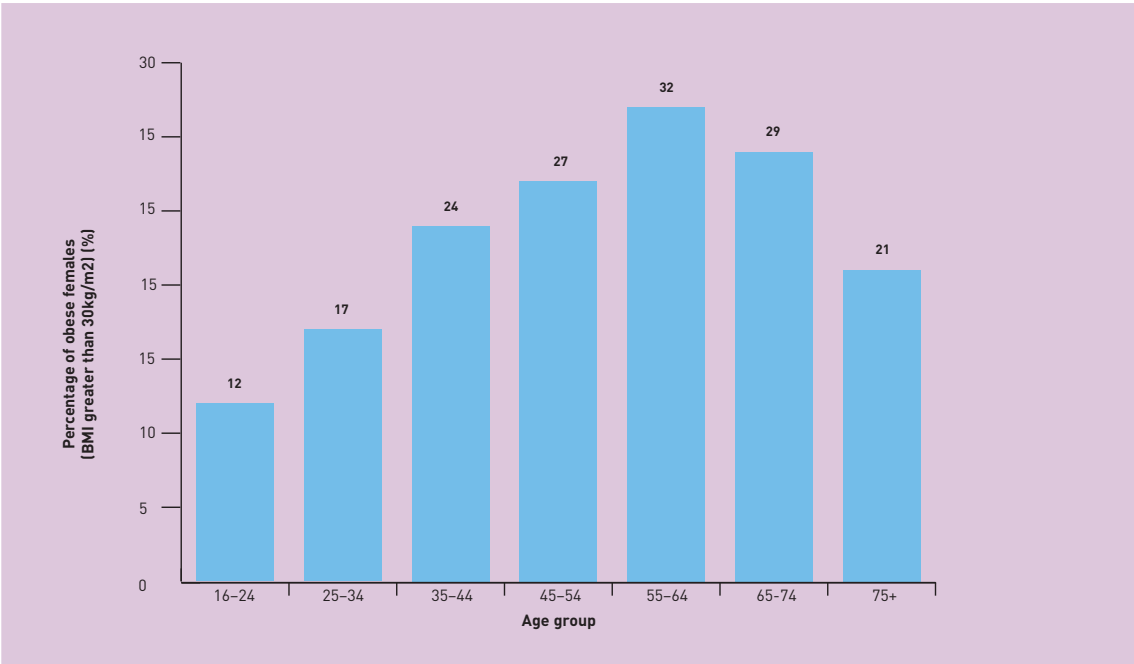


Figure 1. The predicted prevalence of obesity in women in Lambeth in 2008. Overall figure is approximately 14.195 (GLA, 2005)

Method

Service users/sample characteristics

A total of 12 women participated in the study. Six obese pregnant women (with a BMI of greater than 30) were identified on the postnatal ward at a hospital in Lambeth through purposive sampling to attempt to elicit views from different ethnic groups. Three obese pregnant women attended a focus group interview. Additionally, three obese women were recruited who attended an appointment at a nearby fertility treatment unit. This was to identify what women knew about obesity before becoming pregnant.

Semi-structured interviews were conducted with each of the women using an agreed topic guide with open-ended questions. The interviews took place face to face in a private consultation room and lasted approximately 45 minutes. They were not recorded but detailed notes were taken throughout the discussion.

The analysis of service-user interviews was performed using framework analysis: e.g. charting and collating the responses under headings and subheadings, followed by thorough analysis and mapping of the grids to allow interpretation of the data and identification of key themes.

Table 1. Summary of sample characteristics of the participants	
Pregnant obese women	Pregnancy
Participant 1	3rd
Participant 2	3rd (2 miscarriages)
Participant 3	1st
Participant 4	1st
Participant 5	1st (3 miscarriages) by IVF
Participant 6	1st
Participant	Stage of the pathway of treatment
Participant 1	1st visit to clinic and advised to lose weight in order to access IVF treatment
Participant 2	Number of appointments over 3 years. Had been discharged as had not lost enough weight to receive IVF treatment
Participant 3	Number of appointments over 1 year. Had been set target weight loss before able to receive IVF treatment

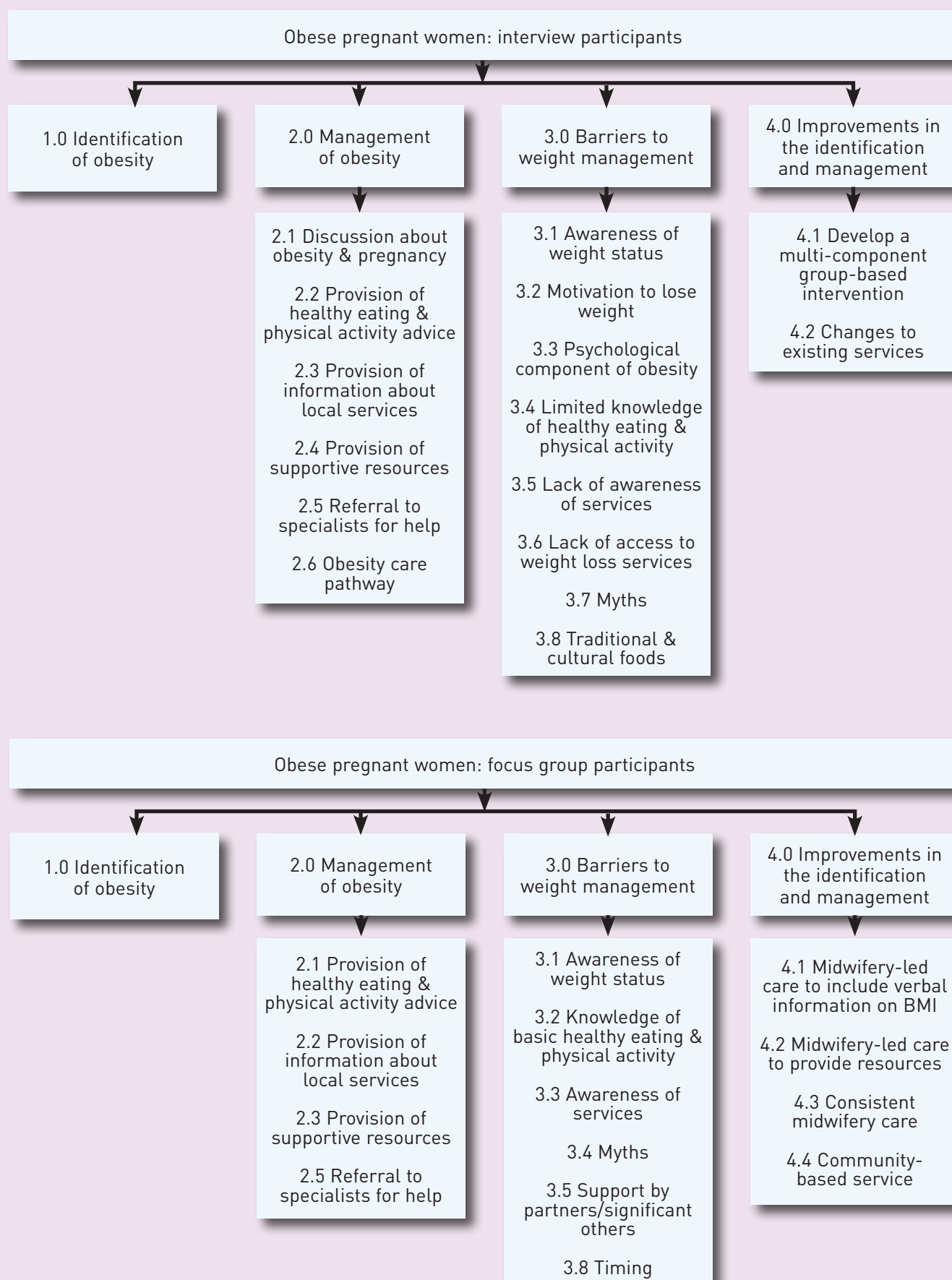


Figure 2. Qualitative themes from obese pregnant women



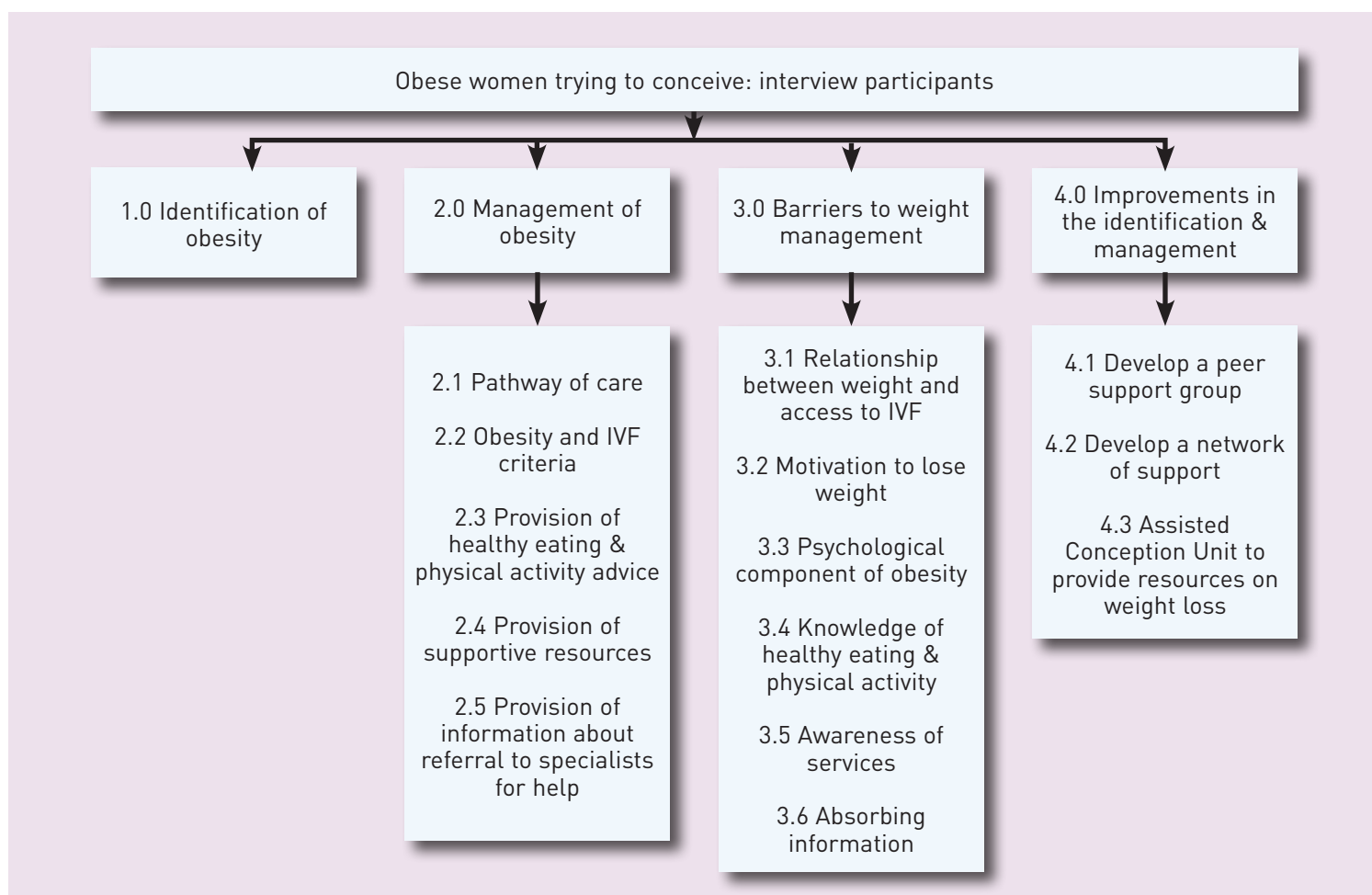


Figure 3. Qualitative themes from obese women trying to conceive

The confidentiality and anonymity of all participants was maintained throughout the project and final report. All women were approached and asked permission to take part in the service evaluation and given the option to withdraw at any time.

### Ethical approval

Ethical approval was obtained from the Hospital Research Ethics Committee for an exploratory cross-sectional qualitative study using semi-structured in-depth interviews.

### Results

A number of key themes were identified during the analysis phase. *Figures 2 and 3* provide a summary of qualitative analysis of obese pregnant women and the obese women trying to conceive.

#### Identification of obesity

Although all women had their height, weight and BMI recorded either by their GP or by a midwife at their first antenatal appointment, their understanding of BMI was limited. Most women did not understand that their BMI classified them as

obese. The health professionals completing the BMI measurements had not explained the concept of BMI nor the risk factors associated with a BMI greater than 30 kg/m<sup>2</sup>.

*'I don't think my BMI was explained well'.*

*'When you read the letter I thought, does that mean I'm a really fat lady?'*

*'So, does a BMI over 30 mean that you are fat?'*

#### Management of obesity

There was a wide variation of responses from women relating to the accuracy and comprehensiveness of the healthy eating and physical activity advice provided by health professionals. Women appeared to be confused by the term 'healthy eating'. Only one woman received information about local services available. None of the women received resources to support the verbal information provided by health professionals.

***'They do not explain what healthy food is.'***

***'Health visitor said lots of fruit and veg and walking and fresh air. She gave me quite good information my health visitor.'***

There is an existing referral pathway to dietetic and counselling services for obese women trying to conceive which is initiated by their named consultant. However, all three women trying to conceive initially chose to lose weight on their own without external support.

Obese pregnant women should also be referred to their consultant obstetricians in line with the local guidelines. Regarding referral to specialists for help, none of the women had been referred to see any consultant obstetricians owing to their high BMI. Only women with gestational diabetes had access to a specialist (e.g. dietician). Thus, there is conflicting information about whether all obese women are offered referrals to specialist services.

### Barriers to weight management

Women who were aware of being obese felt motivated and were ready to change, whereas women who were not aware of their obesity gave the view that they should be managing their weight. One woman who had been attending appointments at the clinic for approximately 3 years and had just been discharged, believed that obesity was not a serious enough or a 'death-threatening' disease and therefore felt unmotivated to lose weight.

The service users' views regarding barriers were classified into practical and personal. Practical barriers included limited knowledge of healthy eating, lack of awareness of local physical activity services, restricted access to specialist services for support and financial constraints. Personal barriers emerged and appeared far more complex. This was evident in relation to the motivation to lose weight and sustaining motivation, timing and weight loss.

***'I do not think that I have a problem with my weight as I eat healthy normal food e.g. fruit, fish and no takeaways.'***

***'... my weight is fine but just too much around the hips but that's not that much of a problem.'***

***'... fatty food is cheaper than vegetables and fruit.'***

The women's decision to change and feeling motivated varied; some women believed they were ready to change during the antenatal phase while others felt they would not reach the motivation to change until the postnatal period.

### Myths

A number of myths were identified and these were primarily associated with eating and exercising during pregnancy and the care of the mother and baby during the postnatal period.

In addition, the role of the partner had an impact on the actions taken by the obese women. In one case the personal beliefs of the partner had prevented the mother from exercising outdoors following the birth of her first child because her partner was worried about the health of the baby. This was illustrated by the quote below:

***'My partner said, "oh no, the baby will get cold."***

### Traditional and cultural foods

A number of women understood that their traditional food and cooking methods have a high fat content but mentioned that they:

***'cannot change from their traditional food as that is what they want to eat'.***

Furthermore, women explained that they have to cook traditional food for their partners.

### Psychological component of obesity

Obesity has been shown to be related to mental health concerns such as depression. One woman explained that she personally had low self esteem because of her weight.

Another woman trying to conceive explained that weight loss is more deeply rooted and requires more than simple dietary and exercise advice. In particular the woman described the emotions involved with trying to lose weight in order to receive fertility treatment. In particular, the woman described the emotions involved with trying to lose weight in order to receive fertility treatment, such as initially having the motivation to lose weight but then panicking, followed by becoming upset, followed by self-loathing, leading to increased consumption of food as comfort and consolation.

### Improvements in the identification and management of maternal obesity

All the women agreed that health professionals, in particular midwives, should provide informa-

tion on BMI and explain its impact on pregnancy outcomes. Continuity of care by a known midwife was also identified as preferable model of midwifery care by women. The following quotes demonstrate these points:

*'I think BMI needs to be explained. It's probably better in a book. Midwife to say read this but it's hard to sort yourself out half way through a pregnancy.'*

*'There is very little in the book that explains BMI'.*

*'One or two midwives deal with that same person'.*

### Developing a proposed new intervention

All of the obese women indicated that they would welcome either increased access to existing services (e.g. dietetics, counselling) or the development of a new service and they suggested the following for a potential new service.

#### Content

All of the women recommended providing interactive sessions combining healthy eating and physical activity supported by booklets and resources. Women also emphasized that the healthy eating sessions must cover all ethnic groups and incorporate traditional, culturally-based foods and other topics such as cooking on a budget, reading food labels and expert question and answer session to counteract myths.

*'There is very little in the book that explains BMI.'*

*'I think BMI needs to be explained. It's probably better in a book.'*

*'Midwife to say read this but it's hard to sort yourself out half way through a pregnancy.'*

#### Structure

Women preferred group-based sessions, compared to a one-to-one service provision. The rationale for favouring group-based sessions included: more enjoyable, allows the women to encourage and motivate each other, help build self-esteem and able to listen and learn from other women's experiences, opinions and ideas.

#### Staff

The women voiced positive views regarding the use

of non-health professionals to assist with undertaking any proposed interventions. A number of women felt that employing 'lay people' who have successfully been through a similar experience would motivate and inspire women. However the women raised the need for health professionals (e.g. midwives and dieticians) to also be involved.

#### Setting

All women suggested a community-based setting as the venue of choice. Reasons for this preference included: ease of access, usually a short distance to travel, ability to provide physical activity sessions and crèche facilities within a friendly environment. In comparison, an acute setting would not provide any of the above benefits and was associated with 'being ill' and 'not healthy'.

#### Frequency and timing of intervention

Women's views on the frequency of the service ranged from once a week to fortnightly. It was acknowledged that sessions that are held at the fixed time every week would encourage attendance.

#### Intervention period

The majority of women favoured an intervention in the postnatal period rather than during pregnancy. They argued that the antenatal period was a time associated with potential worries and complications surrounding the pregnancy therefore not an ideal time to consider weight management. Obese women trying to conceive were motivated to change immediately once they recognized that this would increase their chance of conceiving naturally and reducing their BMI to below 30 would allow them to access IVF treatment.

### Discussion

Despite the plethora of literature on the effects and risks of obesity on fertility and pregnancy, there appears to be little known on how to effectively manage those presenting to health care. The pregnant obese women interviewed were unaware of their weight status, had limited understanding of BMI, did not receive consistent healthy eating and physical activity advice, and were not provided with information about local initiatives that they are entitled to access. In addition, a number of myths during and after pregnancy prevented the women from exercising. This places a significant role on health professionals, particularly midwives, in ensuring that they measure BMI, as well as explain the risk factors associated with obesity and provide brief intervention on dietary and exercise advice. The verbal information should be supported by written resources. The findings,

however, have highlighted an issue with health professionals' lack of knowledge relating to obesity as well as their lack of awareness of the resources within their local community.

The need for psychological support was highlighted by both groups, however, the women trying to conceive emphasized the need more owing to complexities involved in their ability to conceive as well as the motivation to lose weight.

Although there is an existing referral pathway for obese women, both pregnant and those trying to conceive, there is conflicting information as to whether all obese women are offered referrals to their obstetric consultants, dieticians and counsellors. This may be linked to the fact that women may be unable to absorb the information provided to them as a result of overload of information provision and the sensitive nature of the topic raised. However, this highlighted the lack of comprehensive maternal obesity care pathway across the childbirth continuum. This further supports the recommendation for guidelines by CMACE/RCOG.

There was a consensus that any proposed new services should be established at a local, community-based setting and led by trained non-health professionals while being supported by midwives and health visitors. Monitoring and evaluation of any intended service should be included as part of the intervention to enable continuous improvements in the service to take place and to increase the currently limited evidence base on managing maternal obesity.

### Value of this study

A limited number of papers have been published on interventions that aim to tackle maternal obesity (Polly et al, 2002; Claesson, 2008). No studies were found that reported the thoughts, views and recommendations of service users. This study explores women's views from a range of ethnic minorities in Lambeth. In addition, there is currently no evidence to determine a cost-effective, easily accessible evidence-based programme with guidelines for frequency, intensity, duration of exercise and type of activity that will produce optimal outcomes for pregnant women at risk of a number of diseases and obesity. With both an increasing interest in, and questioning of, user involvement in health and social care, the findings of this study are important in providing a first step in ensuring that women's views, knowledge and challenges become part of the evidence base for obesity and potential solutions at a local level to tackle this public health challenge.

### Limitations of this study

Although a representative and relevant sample of service users were identified, the sample size was small. This was mainly because of difficulty engaging women as eight other women who agreed to participate did not attend the interviews. This could be explained by the different priorities women face. In addition, the lack of awareness of obesity, the sensitivities associated with the subject matter and its implications for pregnancy and birth may have contributed to women's lack of engagement in the process. Alternatively, obesity is a highly personal subject that women may not have wished to explore.

This highlights the need for more extensive research to gain women's views at different stages of pregnancy: pre-conception, antenatal and postnatal. In addition, the responses of the service users are specific to the London borough of Lambeth which limits the generalizability of the results.

### Conclusion

It is evident that obese pregnant women and those trying to conceive have unmet health-care needs. This was confirmed by service users' recognition and support for the design and implementation of a midwifery-led multi-component (healthy eating, physical activity and behaviour change) intervention to assist with tackling maternal obesity during both the antenatal and postnatal phases in a community setting. This study provides an insight into women's views while at the same time highlights the lack of evidence for this target group. Any future service addressing obesity should therefore seek to engage service users in its planning and implementation stage. **BJM**

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## Key points

- Maternal obesity is one of the most commonly occurring risk factors in pregnancy.
- Service users highlighted the lack of understanding regarding BMI and its implications for pregnancy and birth.
- Service users welcomed an intervention to manage obesity that should incorporate the cultural aspect of food as well as psychological impact.
- Any obesity intervention should be community based, interactive and multi-component: addressing physical activity, nutrition and behaviour.

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