1. Title Page

Obesity in Pregnancy: A Study of the Impact of Maternal Obesity on NHS Maternity Services.

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Short Headline: Maternal Obesity Impact on NHS Maternity Services

2. Abstract

Objective: To gain a detailed understanding of healthcare professionals' perceptions of the impact that caring for obese pregnant women has on maternity services.

Design: Qualitative interview study using purposeful sampling and face to face interviews.

Setting: 16 maternity units in NHS Trusts in the North East Government Office Region of England, UK.

Sample: 33 maternity and obstetric healthcare professionals with personal experience of managing the care of obese pregnant women.

Methods: Semi-structured interviews with healthcare professionals representing each maternity unit in the region. Transcripts were analysed using systematic content analysis.

Main Outcome Measures: Views on: the impact maternal obesity has on maternity services; the facilities required to care for obese mothers in pregnancy; and existing services directed toward maternal obesity.

Results: Five dominant themes relating to service delivery emerged; booking appointments, equipment, care requirements, complications and restrictions, and current and future management of care. Many of the issues identified were associated with managing the care of obese women in pregnancy safely, resources and cost issues to be able to do this, multidisciplinary care requirements due to co-existing morbidities when the mother is obese, and restricted care options and patient choice.

Conclusions: Health care professionals in the North East of England feel that maternal obesity has a major impact on services and resource, on the health of both the mother and child, and on the psychological wellbeing of the mother.

3. Main Body of Text

Introduction

The increasing prevalence of obesity in the UK general population is of major public health concern. The Health Survey for England ¹ showed that the prevalence of obesity is increasing, and that the North East region has consistently had a higher prevalence than the national average, making tackling obesity a public health priority in the North East.

International research has highlighted the fact that maternal obesity has implications for both the mother and her infant. There are increased risks to the mother throughout the pregnancy (including gestational diabetes, hypertensive disorders and thromboembolic complications), and to the infant (including macrosomia, shoulder dystocia, late fetal death, congenital abnormalities), and also increased complications during labour and the need for more frequent induced and operative deliveries ^{2 3}. Limited UK research has shown that these reported health risks and complications are also relevant to the UK population ^{4, 5, 6}, and the 2004 triennial report by the Confidential Enquiry into Maternal and Child Health (CEMACH) showed that 35% of all maternal deaths in 2000-2002 were in obese women (BMI $\geq$ 30 kg/m²); 50% more than in the general population.⁷

In addition to the increased health risks associated with obesity in women who become pregnant, there is also a demand for additional care and resource from health service providers. However there has been limited research addressing this factor as a measured outcome, internationally or in the UK. Two studies carried out in Montpellier, France ^{8, 9} addressed the cost implications of obesity in pregnancy, and reported the prenatal care cost to be 5.4-16.2 fold higher in overweight and obese women with a body mass index (BMI) of 25 to $<35\text{kg/m}^2$ compared with the prenatal care cost of normal weight women (BMI 18-24.9kg/m²). When both pre and postnatal care was considered, this cost was seen to rise further in women with a BMI $>29\text{kg/m}^2$, due to an increased duration of day and night

hospitalisation (an average of 4.43 days more than lean women). The percentage of infants requiring admission to neonatal intensive care was 3.5 times higher in mothers who were obese⁹.

One reason why the impact of maternal obesity on maternity services may not have been studied thoroughly in previous research could be the difficulty in quantifying many of these factors. Currently there is no national information strategy relating to the collection of maternal obesity data in the UK, therefore there is likely to be varied data collection practice between maternity units. Determining the impact of maternal obesity on service delivery and clinical practice using quantitative data may therefore misrepresent the true impact due to the reliance of routinely collected data within maternity units. The health care professionals that care for obese mothers and their infants were considered to be in the best position to holistically identify the impact of maternal obesity on service delivery and clinical practice; therefore a qualitative methodology was utilised.

This study reports the perceived impact of maternal obesity on maternity services identified by health care professionals caring for obese women in pregnancy in the North East region of England.

Methods

An information pack outlining the aims of the study was sent to the heads of midwifery at each maternity unit. Clinical members of staff within all maternity units in the North East region of England were invited to take part in the study. This included midwives, consultant obstetricians, specialist registrars, dietitians, physiotherapists, specialist nurses, clinical ward and service managers, and community practitioners. Any members of staff that had a specific interest in maternal obesity and who were involved in aspects of care specific to obesity were invited to take part in the study as a priority. Interviews were conducted with at least one clinical member of staff either on a one-to-one basis, in small group discussions, or

as part of a broader meeting within the department, depending on the request of the clinicians in the maternity units. Any members of staff that had an active interest in maternal obesity but who could not attend the interviews were encouraged to participate by emailing any relevant information, or to pass on topics for discussion via a member of staff who would be in attendance.

The semi-structured interviews were carried out between March and October 2005. The interviews utilised low structured questions encompassing broad subjects, which were used as prompts for discussion to allow clinical staff to elaborate on issues as required. All subjects for discussion were covered in each interview for consistency, however the sequence in which the subjects were discussed varied and was dependant on the natural progression of conversations with the interviewees. The interview questions were piloted in one of the maternity units; the topics addressed are shown in Box 1.

The researchers made detailed notes during each interview, which were always transcribed the same day by NH to ensure the validity of the data collected. These were then emailed to the interview participants to confirm that they were accurately represented. Any necessary amendments were made and final copies of the transcripts were returned to the interviewees at each unit for their record. Where the interviews took place with more than one person then two researchers were present (NH, RL) and, where possible, notes were taken. Both researchers checked the draft transcripts independently prior to them being sent to the participants for validation.

Interview transcripts were analysed using the recommendations made by Burnard for systematic thematic content analysis of semi structured interviews, which uses a category system and is adapted from the grounded theory approach ¹⁰. NH and RL developed category systems independently in order to enhance the validity of the findings and to remove the potential for researcher bias.

The two independently generated category systems were then compared, and following discussion a final category system was produced which both researchers accepted as being representative of the data. A third independent researcher who was not familiar with the project (JS) was also asked to develop a category system. The final category system was then adjusted where necessary as a result of the third independent researcher's results to ensure all themes were captured without bias.

Each transcript was coded using the final list of category headings against full statements. The coded transcripts were checked independently for any miscoded statements, and continuity of data interpretation. The coded statements were then grouped into the broader categories, which identified the recurring themes. Copies of the full transcripts were retained for the write up process to ensure that the key themes identified remained in context with the discussion of the findings.

A confirmatory focus group was carried out following the completion of the interviews to check that saturation of themes had occurred. This additional focus group included clinical representatives of specialities that were under-represented in the initial interviews.

Results

All maternity units in the region invited to take part in the study responded (n=16), and thirty-three healthcare professionals were recruited: five heads of midwifery, eleven clinical midwifery managers, eight midwives, five consultant obstetricians, one physiotherapist, one dietitian, one obstetrics specialist registrar, one diabetes nurse specialist (see table 1). The confirmatory focus group involved health care practitioners that did not take part in the initial interviews and included: one dietitian, one paediatrician, one general practitioner (GP), and one head of midwifery.

Five recurrent themes relating to maternal obesity were identified from the interviews; booking appointments, equipment, care requirements, complications and restrictions, and current and future management of care.

Theme 1: Booking Appointments

All the maternity units (n=16) stated that the location of the first antenatal visit when booking details were taken determined whether or not the maternal height and weight were directly measured or self reported. The general consensus was that if the booking appointment took place in an NHS location then the weights and heights were usually measured if equipment was present, whereas home bookings tended to rely on self reported weights and heights as community midwives do not have portable equipment to take accurate measurements. This issue was re-established in the confirmatory focus group where it was emphasised that bariatric equipment was available within hospitals and GP practices, however scales were not always available for home bookings.

“Weighed or self reported heights tend to be done ad hoc, there is a BMI reported for all women but whether it is measured depends on where the booking appointment takes place - the maternity unit has midwifery led care so many of the bookings are done at home. Home bookings are likely to be self reported unless the midwives utilise bathroom scales if they are available”

(Consultant Obstetrician, Maternity unit 12)

The location of the booking appointment was also considered to potentially influence responses from mothers to sensitive questions.

“If the booking appointment is in the home then there may be external influence due to other people being around at the time, whereas in a hospital booking there is more of an opportunity for one-to-one discussion and this may influence the data. For

example if there is something that the mother doesn't want to say in front of others then often this is updated/addressed at follow up hospital appointments.”

(Clinical Midwifery Manager, Maternity unit 6)

Theme 2: Equipment

The issue of having appropriate equipment for obese mothers was consistently raised; this subject was saturated at a very early stage in the initial interviews, and also re-addressed in the confirmatory focus group. Specific problems related to the requirement and availability of equipment with a maximum expansion or weight load, and equipment requirements in theatre for surgical deliveries. Theatre tables and scales were most frequently cited as examples of equipment that there were issues with.

“The theatre table can hold up to 27 stones. Occasionally the woman has had to have surgery on the general bed as opposed to the theatre bed, and there have been instances where this is not enough and the women have had to go to main theatre for surgery.”

(Midwife, Maternity unit 16)

“Occasions where women have had to be sent to the medical ward to be weighed as the maternity scales have a maximum weight limit of 125kg.”

(Consultant Obstetrician, Maternity unit 10)

Other examples of additional equipment requirements were given, most of which have significant financial implications per item such as delivery beds. However, costs associated with less expensive equipment which is required routinely for obese women, could have significant cumulative costs.

“Equipment mainly couches, chairs... Wheelchairs for excess of 300kg are available in the hospital but not in maternity unit although if required can be obtained from elsewhere. Chairs in the waiting room in the maternity units are not changed yet but

they are in the process. There are theatre tables that hold an excess of 300kg but the units want a permanent one so they are not being moved around all the time. There are issues around the trolleys used to transport women to theatre - they take the weight but not the girth.”

(Head of Midwifery, Maternity unit 8)

“Also less expensive equipment (than the beds etc) is required that adds up the cost, such as longer length needles for spinal anaesthesia, the need to open additional equipment to hold fat back during caesarean section.”

(Head of Midwifery, Maternity unit 13)

Theme 3: Care Requirements

All maternity units (n=16) have policies for routine referrals for consultant led care when the mother is obese. Some maternity units also carry out precautionary anaesthetic assessments in case a caesarean delivery is required (n=12). The need for this level of high dependency care in relation to maternal obesity was based on the mothers' BMI in all maternity units, but the BMI cut off point that determines routine referrals varied between maternity units; from BMI 30kg/m² to 50kg/m². Six maternity units stated that they have had to change their policy for referring obese women for consultant led care: they had previously referred women with a BMI>30kg/m², but as the caseload was too great it was increased to BMI>35kg/m² (n=5 units) and BMI>40 kg/m² (n=1 unit). The need to increase BMI cut off points due to difficulties in meeting the demand for services was also discussed in the confirmatory focus group in relation to precautionary anaesthetic referrals.

All maternity units stated that obese mothers had individual care plans made when referred for consultant led care. The individual care plans made at this time often determined the frequency of follow up, referrals to dietetics and referrals to physiotherapy. Maternal co-existing morbidities were also described as determining the level of high dependency care

required. It was stated that there are generally more existing and developing morbidities when the mothers are obese, and that this impacts on the antenatal care requirements.

A number of additional procedures were identified as being required in the care of obese women. Two maternity units stated that obese mothers required glucose tolerance tests at the start of pregnancy and towards the end of pregnancy. Additional scans were also deemed necessary for obese mothers by some maternity units (n=6), as it was more difficult to see the fetus, and to determine the fetal size and presentation. Some maternity units identified the risk of misdiagnosing conditions when the mothers are obese, such as high blood pressure due to blood pressure cuffs being too tight, or difficulty in determining fetal size resulting in not diagnosing macrosomia or intra-uterine growth retardation (IUGR). These issues were all re-iterated in the confirmatory focus group. Carrying out unnecessary procedures and needing to use alternative monitoring methods were identified as being additional care requirements for obese mothers (n=8 units). These related to fetal scalp electrodes sometimes being used to get a direct ECG when it is difficult to hear the baby's heartbeat during delivery, the need for intra uterine pressure catheters to monitor contractions, and difficulty in determining the presentation which has implication if it is not a normal vertex presentation.

“The excess layers of fat also make it more difficult to palpate to determine fetal lie when the mother is obese, and there are difficulties when doing ultrasound scans and listening to the fetal heart. During labour it is more difficult to pick up the contractions and fetal heart rate, and this can lead to misinterpretation of what is being picked up, which determines the outcome. For example the labour might be misinterpreted as being abnormal which could lead to an unnecessary change in the plan of action, caesarean etc.”

(Clinical Midwifery Manager, Maternity unit 6)

“There isn't a way round monitors, because you can't always get a good pick up of the heart rate, and you have a co-existing problem because you might want to put a

scalp electrode on but the internal passages have adipose tissue as well so it makes that more difficult”

(Head of Midwifery, Confirmatory Focus Group)

When discussing the service requirements relating to maternal obesity the need for Multi Disciplinary Care (MDC) was highlighted. The majority of existing MDC within maternity units relates to diabetes care, and many maternity units have joint clinics that are attended by a number of different clinical specialities required when caring for diabetic mothers. Dietetic and physiotherapy support was also discussed as a care requirement of obese mothers. Maternity specific physiotherapists were available at some maternity units, whereas other units referred to the physiotherapy department as and when needed. Dietetic support in the maternity units also varied. All the maternity units had some form of dietetic service, however the vast majority did not have a specific dietetic service relating to maternity (n=14), in comparison to those units that did (n=2).

A number of factors highlighted in the care requirements of obese mothers have an impact on maternity services’ waiting lists, and other departments’ resources; such as loaning equipment and utilising theatre lists for elective and emergency surgery.

“The lack of an operating table large enough for elective caesareans means that these women are booked in on the gynae theatre list which disrupts the list and has implications on the waiting times for the women who need surgery for gynae problems, this happens approximately twice a month. The gynae theatre table is also required when an emergency caesarean is required which disrupts the theatre list and impacts on the waiting times as well.”

(Head of Midwifery, Maternity unit 14)

There is a need for additional staff in theatre, and for consultant theatre staff rather than a registrar. There is more demand for one-to-one care, and the overall length of stay was deemed to be longer, which has an impact on both waiting lists and staff resource.

“Following surgery there are more complications with wound healing and wound infections, the length of stay is also increased, especially if pre-eclampsia develops, usually a five day stay with pre-eclampsia. There is additional cost of the medications required as well, and the medication for pre-eclampsia means that one-to-one care is required from the midwife as they are high dependency.”

(Midwife, Maternity unit 16)

Theme 4: Complications and Restrictions

Many of the complications and restrictions addressed by the clinicians caring for obese women were significant throughout the entire pregnancy and included the antenatal period, labour, and post delivery. The overall consensus was that obese women are more likely to develop co-morbidities throughout the antenatal period. Examples given were pressure sores, deep vein thromboses (DVT), symphysis pubis, incontinence, diabetes, and pre-eclampsia. Reduced mobility was highlighted as an added risk factor for DVT, but this also poses moving and handling issues for the staff. The need for increased pain relief was also identified as an effect of reduced mobility during labour, there was more difficulty in siting and administering analgesia, and failed administration leading to the need for general anaesthesia which is more of a risk when the mothers are obese. Other issues raised by staff related to difficulties in accessing body sites; the main issue for physiotherapy was difficult access to the joints, bones, and peritoneum for assessment and administering treatment.

“Overall the main issues in physiotherapy are access to joints, bone, and peritoneum, which causes difficulties in manipulating as you would like to.”

(Physiotherapist, Maternity unit 10)

Nine maternity units highlighted reduced patient choice, with method of delivery being the main issue when the mothers were obese. There are restrictions for pool births, not due to the maximum weight restriction of the pool, but the lifting and handling issues for staff, and the potential for requiring emergency interventions such as an emergency caesarean delivery. Home births were addressed by two maternity units which stated that although obese mothers would be discouraged from having a home birth due to the high risk, they could not refuse them if that was the patient's choice. Reduced choice for midwifery led care and limited choice for pain relief due to difficulties with citing epidurals were also discussed, and these factors were supported by the confirmatory focus group.

"There are restricted options for deliveries - mothers with a BMI over 30 or weighing more than 90kg are not able to use the birthing pools due to the increased risk of shoulder dystocia and subsequent emergency and additional procedures being required, also the lifting and handling issues and physically being able to get the women out of the pool, for example in the case of collapse."

(Clinical Midwifery Manager, Maternity unit 7)

Postnatal complications and restrictions were also identified. Three units highlighted that there is increased support required for breastfeeding whilst most units (n=11) stated that the main issue was a higher rate of infection and slower wound healing in obese women which is uncomfortable for the mother, but also requires additional drugs, dressings, and hospitalisation.

Patient dignity and embarrassment was raised by some of the clinicians. Two units stated that the psychological issues relating to maternal obesity often varied between the mothers. Some women tend to be embarrassed about their weight, whereas others do not see it as a problem during their pregnancy and this point was raised in the confirmatory focus group with discussion around the normalisation of being overweight and obese making some women not see it as an issue.

“One problem is non recognition of the fact that they are overweight, and that’s quite often the younger end of the age group as their peers are the same.”

(Head of Midwifery, Confirmatory Focus Group)

Three units stated that they thought there was a general lack of awareness about the effects of being obese when pregnant: of the complications it causes, the restrictions to care, and the potential effects on the outcome of pregnancy.

“It is embarrassing having to find extra large theatre P.J's for the fathers who are often obese when the mothers are obese as well, and how to word and approach the issues as a member of staff, how to handle the situation without making the mother feel uncomfortable - it's difficult to get a balance. Some women in the past have chosen to deliver elsewhere as this unit has tried to broach the subject and other unit has not – the women felt victimised... There is a lack of awareness of the mothers pre-conceptually and during pregnancy of the outcomes and complications when women are obese, unaware that the overall management is different due to the mothers weight... there is difficulty in getting scan pictures and not being able to see the baby due to fat mass - consequences for care providers but also the parents can't see anything on the picture.”

(Clinical Midwifery Manager, Maternity unit 7)

Theme 5: Current and Future Management of Care

In most units, study participants thought patient information was an issue (n=14). The NHS patient information booklet was the only form of dietary patient information in the majority of maternity units (n=11). This booklet generally addresses healthy and safe eating rather than weight gain or specific dietary requirements related to BMI. With regard to information about diet and weight gain, some maternity units stated that the advice was likely to be inconsistent and ad hoc (n=7), and of the maternity units that discussed weight gain recommendations in the context of policy (n=12), none had a policy or guideline on recommended weight gain

during pregnancy. Weight stability rather than weight gain was recommended in obese women in four units. Five maternity units mentioned that a new policy for maternal obesity/nutrition was under development.

“There are maternal nutrition guidelines being developed - previously combined maternal and infant nutrition guidelines but they are now being split. These only advise on healthy eating and "do's and don'ts" relating to soft cheese etc, they don't include weight gain recommendations but do include weight gain indications of what is normal weight gain.”

(Head of Midwifery, Maternity unit 8)

A number of factors were suggested on how to manage maternal obesity. Improved links with dietetics and weight management groups for pregnant mothers in the maternity units were suggested as measures to tackle obesity in pregnant women. Increased dietetic involvement was also discussed in the confirmatory focus group, however there are resource issues that might make this difficult to achieve. Community interventions were also considered to be important, as it was viewed to be too late by the time mothers attend a maternity unit as they are already pregnant and weight loss couldn't be advised.

“There could be improved links with dietetics; it would be good to have weight attendance classes or something like that. [2 named midwives] are in the early stages of discussing the possibility of starting some healthy eating classes. Every midwife discusses the diet at booking and gives the woman appropriate dietary leaflets, it would be nice to perhaps have more time to go into more detail with certain things. Time at booking with the midwives is very limited as they only have 45mins - 1hr with each woman and there is a lot of information to get through.”

(Midwife, Maternity unit 16)

“It's about patient education, making them aware of the risks to themselves and the baby”

(GP, Confirmatory Focus Group)

“The referrals we get tend to come from the combined clinic, women with impaired glucose tolerance. I think it would be very valuable to do it [set up a referral service for women based on their BMI] because often you find they are more motivated when they’re pregnant, and also to ensure you pick them up post delivery. With the impaired glucose tolerance ones we do but there are other women who may have equal weight problems but they are not referred through because they don’t meet the criteria”

(Dietitian, Confirmatory Focus Group)

“They [public health interventions] focus on obesity, the bit that’s missing is ‘do you realise your baby is at risk if you become pregnant?’ that bit doesn’t seem to be there. They can get that from the midwives when they come in but it doesn’t seem to be out there beforehand, apart from those who maybe have a co morbidity and go to say the preconception clinics for diabetes”

(Head of Midwifery, Confirmatory Focus Group)

The question of where does the responsibility of maternal body weight during pregnancy lie was raised. This was considered to be a major factor for service delivery in one unit. Delivering a balance of information to the mothers was deemed important, but recognised to be difficult.

“There needs to be a balance when making women aware of the issues: for example not being blunt and trying to be kind - but by doing this we’re perhaps not giving enough information - difficult to get the balance.”

(Head of Midwifery, Maternity unit 13)

“Women do not like to be told they are overweight, when you are going through the risks to them and the baby they really don’t want to take it on board that often but you have to because if you don’t tell them what the risks are you then get problems later on and they come back and say they weren’t told. But when we get them they’re

already pregnant and we can't take the pregnancy away, so there has to be something done before they get to that stage to control the weight"

(Head of Midwifery, Confirmatory Focus Group)

Discussion

The health care practitioners interviewed described maternal obesity as having a major impact on service, specifically in relation to the level of care required, the cost and resource implications, complications and risk to the mother and infant, and existing or developing morbidities related to maternal weight. The psychological issues for the parents when obesity is a part of pregnancy are also deemed to be important. The lack of general awareness of the implications of maternal obesity for parents, and the difficulty for staff in getting the balance of information across is something that needs to be addressed for future management of care.

Saturation of certain themes was obvious at an early stage in the study due to much repetition of the same issues throughout the interviews; this was most evident when discussing equipment requirements for the safe care of obese women in pregnancy, and the confirmatory focus group confirmed that saturation of themes had occurred. Despite this, the interviews continued to incorporate discussions around the same subject headings to allow all maternity units an opportunity to identify their issues. This was considered to be important to allow staff from clinical specialities under represented at early interviews to have an opportunity to discuss issues specifically related to them.

The regional nature of the study encompassed variations in population groups attending the maternity units in terms of socio economic status, ethnic background, the maternity units being in a rural or urban setting, the size of the units and whether they were midwife or consultant led, which also could have potentially led to differences in issues raised. Despite utilising the same low structured questions for discussion, early interviews may still have

influenced later interviews in terms of the interviewers incorporating examples given by other maternity units in instances where clarification of questions was required; however this was rare due to the low structure of the questions being open to various points for discussion.

Published international research supports a number of the themes identified. Studies relating to labour progression and interventions required particularly support the concerns of the regional health care professionals. The need for induction of labour and caesarean deliveries when the mother is obese or morbidly obese has been reported by numerous studies^{5,11,12,13,14,15,16,17,18,19}. Vahratian et al²⁰ discuss the need for more frequent administering of oxytocin to stimulate contractions during labour, and a significant increase in emergency caesarean deliveries in the obese mother. Rode et al²¹ also address a significant increase in emergency caesarean delivery rates, as well as overall caesarean rates, and elective caesareans. Cedergren et al²² reports an increase in both caesarean and instrumental deliveries in the moderately obese, severely obese, and morbidly obese mothers, whereas Weiss et al¹⁸ only found a significant association with instrumental deliveries when the mother was morbidly obese.

Other issues relating to maternal obesity that were identified in the interviews and are supported by published evidence relate to a higher incidence of shoulder dystocia^{5, 22}, longer duration of labour²⁰, postoperative maternal morbidities such as wound infections and urinary tract infections^{15,5}, length of stay and frequency of contact/level of care required due to coexisting and developing comorbidities^{15,8}, and complications with the infant during delivery and neonatally such as fetal distress, birth trauma, and feeding difficulties^{5,19,16,22}.

A number of issues raised in the interviews are not supported by published research; this may be due to the reliance of the majority of published studies on quantitative methodology and addressing specific biomedical impacts of maternal obesity, in particular relating to the outcome of pregnancy. To the authors knowledge no other published studies look at the

impact of maternal obesity on service using qualitative methodology. This methodology has allowed for a richer data source than a quantitative study could obtain. This is most evident in discussions relating to the health care professionals' perceptions of managing maternal obesity and their view on the emotions that are related to this subject; in particular relating to the psychological impacts of maternal obesity and the difficulties faced by health care practitioners when caring for obese women in pregnancy. There is an absence of studies addressing the psychological impact of maternal obesity, which is an important issue, especially if maternal health is to be viewed not in biomedical terms of absence of disease, but in the positive view of health as being a state of *'complete physical, mental and social well-being and not merely the absence of disease or infirmity'*²³.

The general feeling of not knowing how to handle the subject of obesity with the mothers or how to get a balance of information across without having a detrimental effect is something that requires further study. While the healthcare professionals understand the risks of being obese and pregnant, it was repeatedly stated that the mothers were unaware of the issues. With staff not knowing how to broach the subject, and feeling blame for victimising the mothers when they do raise the issue, this then becomes a vicious circle and the message does not get across to the mothers.

Some of the healthcare professionals discussed maternal obesity as a public health issue. However, they recognised that obesity related initiatives in the public health arena tended to focus on associated morbidities, and neglected family planning as an issue. Nankervis et al²⁴ discuss how the attention on the health burden of obesity has focused on all-cause mortality, and neglected the effects on the reproductive system and outcomes of pregnancy. They stated that solutions to the problem are inevitably going to be multi-faceted and costly, but suggest that as part of general public health effort to tackle obesity, pre-pregnancy counselling should be carried out for all women, and every effort to intervene should be made in those women who are overweight or obese prior to the pregnancy being

established. As the majority of women are highly motivated to have healthy babies, this could be very beneficial and a key factor in the success of public health interventions in this field.

Maternity unit staff also suggested some practical changes to practice that could potentially have a positive impact on the issue. The suggestion was made that improved links with dietetics could potentially help to improve things. However, it was also stated that the majority of maternity units did not have maternity specific dietitians, that there was an issue with the dietitians' waiting lists, and that some women refused referrals when they were offered. The suggestion of implementing weight management groups within the maternity unit was also raised. Although this will not help to prevent maternal obesity in the first instance, it could potentially be a good way to help make sure that the mothers gain a healthy amount of weight during pregnancy, and be the start of preconception counselling for any subsequent pregnancies. However, with an absence of national guidelines or published research in the UK relating to appropriate weight gain during pregnancy when obese, this could also potentially increase the level of inconsistent advice given to mothers.

While the analysis of the data in this study adhered to a stringent methodology in order to eliminate potential author bias and to ensure validity of the findings, there is a potential for bias to encroach into other aspects of this study.

The interviews were not tape recorded in an attempt to make the environment as natural as possible for the participants, especially with the potential for clinical hierarchy making some interviewees less confident about putting their views across. Steps taken to limit the potential for recall bias or misinterpretation of the data by the researcher were that the interviews were always transcribed the same day by a researcher present at the interview, the second researcher (if more than one present at the interviews) also checked the interview transcripts for any inaccuracies, as did the interview participants. Changes to the transcripts were made

in any instances when the interviewee thought that there were inaccuracies or misinterpretation of the discussions.

There is also some potential for participant bias as the recruitment was carried out by an “insider” at each maternity unit, leaving this open to be determined by established working relationships and potentially clinical hierarchy. The decision to utilise this methodology was to reduce the risk of carrying out the interviews with members of staff who are not in the best position to discuss the content of the study. The varied clinical specialities that attended the interviews suggest that the recruitment as not biased, although there was a lack of interviews with dietitians, physiotherapists, GP’s, and paediatricians. These under represented clinical specialities were included in the confirmatory focus group, with the exception of a physiotherapist where there was a lack of interest from this speciality. This lack of interest is not surprising considering the earlier interviews highlighted an absence of physiotherapists that were specifically involved in maternity care. The inclusion of the additional specialities did not lead to the development of different key themes in relation to this study’s focus of the impact of maternal obesity on NHS maternity services, confirming that saturation had occurred.

The confirmatory focus group did include discussions around additional themes that were not directly relevant to this study; however these issues are considered to be important and warrant further investigation. In particular, issues were raised relating to the motivation to lose weight and change lifestyles. From a dietetic perspective it was considered that women attending diabetes preconception clinics, or infertility clinics in order to lose weight to conceive, are more highly motivated than under circumstances where the only outcome is weight loss. The role of the media was also considered to be a motivational factor for some parents to take their children to see a dietitian, as was a member of the family developing diabetes or some other morbidity related to obesity. From a paediatric perspective motivation was said to be a difficult for the child as an individual unless the situation was addressed

from a family perspective, as children don't tend to think of the long term risks of being overweight; however it was considered that children who were being bullied tended to be more motivated to lose weight.

Conclusions

Health care professionals caring for women in pregnancy feel that maternal obesity has major implications for service delivery. The impact relates to resources and cost implications, additional care requirements due to the complications that arise and the impact on the health of the mother and her infant, the restrictions in care options for the women, difficulties in carrying out certain procedures, and the impact on the psychological health of the mother. Some health care professionals feel that maternal obesity is a public health issue, and there is concern relating to the lack of national guidance on which to base local policy for the care of obese women in pregnancy.

Some of the issues raised in this study warrant further research. The non quantifiable outcomes of patient dignity, the psychological health of the mother, and the difficulties encountered by some health care professionals in addressing issues with obese pregnant women have not been addressed by previous published studies, yet are highly important issues. Future research into the quantifiable factors relating to service delivery should also account for the cost to the NHS as this is also an unexplored topic in the UK.

4. Ethics

Public Health Observatories (PHOs) were set up in 2000 and are funded by the Department of Health. There are nine public health observatories in England. They have a remit to make better use of routinely available information and to identify gaps in information which need to be filled. PHOs are authorised to hold confidential data on hospital activity by the Department of Health's Security and Confidentiality Advisory Group. In the North East, the handling of confidential data is overseen by a Caldicott Guardian.

This investigation was carried out by the Regional Maternity Survey's Office (RMSO) which is formally a part of the PHO as part of its ongoing work to improve the routine information collected in relation to pregnancy and infant health. The work of the RMSO is overseen by the Region's MREC. This piece of work was therefore carried out as part of the routine work of the PHO and the RMSO. All confidential data was handled in the confines of the PHO 'safe haven'. In addition, the University of Teesside's ethics committee also approved the work.

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6. Competing Interests

The North East Public Health Observatory provided funding for this study; there are no competing interests from any of the authors or organisations involved.

7. Contribution to Authorship

All authors contributed to the design of the study. NH and RL carried out the data collection and analysis. NH, RL, JR, JW, and CS contributed to paper writing.

8. Duplicate Publications The results from this piece of research have not been published elsewhere in a peer reviewed journal.

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