A multi-perspective examination of women's engagement with weight management behaviours and services during pregnancy

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Abstract

This portfolio presents a unique and significant body of research which together provides a substantial, original description and analysis of women’s engagement with weight management behaviours and services during pregnancy. This body of research examines this topic from multiple perspectives, concluding with a detailed interpretative study which sheds light on the deep-rooted determinants of women’s weight-related behaviours during pregnancy. All outputs are articles published in peer-reviewed scientific journals:

Article one describes an evaluation of the acceptability of an individual, home-based perinatal weight management service, based on a qualitative examination of the experiences of obese women who used the service during pregnancy. The findings showed that women valued the support they received from the service, and highlighted home visits, personalised advice and regular weight monitoring as beneficial, while suggesting that more frequent appointments and practical support with target behaviours would enhance the service.

Article two describes a qualitative study of the views and experiences of obese women who had declined or disengaged from the service evaluated in article one. The study identified the referral experience as key to women’s decisions to decline participation, highlighting the need for midwives and other health professionals to have detailed knowledge of the service and training on how to sensitively offer this additional support. Findings also demonstrated that some obese women lacked the confidence or capability to successfully change weight-related behaviours, even with support, leading them to disengage from the service.

Article three compares and combines qualitative data obtained from two sets of midwives, each referring women to either a one to one, home-based weight management service, or a group, community-based weight management service, to explore how midwives approach the referral with obese and overweight women, and their views of women’s responses to being offered a referral. Findings highlighted the important role midwives play as gatekeepers to weight management services and raised questions regarding how midwives approach the referral process.
within the wider context of the maternal obesity issue. The findings also suggest that services might improve uptake through addressing pragmatic and motivational barriers, and through better communication with their referral agents.

Article four describes analysis of qualitative data collected from women who declined a referral to a group, community-based weight management service during their pregnancy, specifically exploring their views on being referred to the service by their midwife. In contrast to the findings described in article two, women in this study reported finding the referral acceptable, and that they expected to receive information about such services from their midwife. The more positive response of these women could be attributed to a number of potential factors, including; an increase in women’s awareness of the risks of maternal obesity, an increase in midwives’ confidence and skill to raise the issue of weight in the time elapsed between the two studies, or a different approach to making the referral between the two services.

Article five reports the findings of a qualitative study using Interpretive Phenomenological Analysis (IPA) which sought to explore in detail the lived experience of a first pregnancy and the process of making decisions about diet and physical activity during this time. The article aimed to further illuminate the multiple and significant barriers to adopting positive dietary and physical activity behaviours during pregnancy, and to challenge the commonly cited belief that ‘pregnancy is a good time for behaviour change’ by examining women’s experiences with specific reference to the model of ‘Teachable Moments’ (McBride, Emmons, & Lipkus 2003). While partially supporting the model, the results also indicated that women with healthy, uncomplicated conception and pregnancy experiences base their diet and physical activity choices primarily on automatic judgements, physical sensations and perceptions of what pregnant women are supposed to do, which in turn suggests limited opportunity for antenatal health professionals to intervene and subsequently influence behaviour.

These accumulated findings suggest that there is much that can be done to increase obese women’s engagement with maternal weight management behaviours and services. Service providers and commissioners could draw on these findings to
design services which better meet the needs of many obese women, such as receiving personalised support, at a time and location convenient for them, and providing regular weight monitoring. There are also implications for health professionals’ education and clinical practice, with findings indicating that midwives would benefit from further training and better information about the weight management services they are asked to refer to, in order to make referrals more evidence-based and increase their confidence to advocate for the service to women who might benefit. Finally, the work presented in this portfolio further informs our understanding of the psychosocial determinants of women’s weight-related behaviour during pregnancy. It suggests that researchers and practitioners should consider how to tackle the largely socially learned, sub-optimal behaviour patterns that are often established in early pregnancy and how to activate more reflective decision-making in relation to diet, physical activity and weight management.

The portfolio also includes critical reflection on each of the outputs and the contribution of each unique study to the development of the author into an independent and expert researcher, and concludes with suggestions for future research.
Acknowledgements

Grateful thanks and appreciation go to Professor David French, who provided inestimable guidance and supervision throughout my PhD journey, and to Dr Wendy Clyne for supporting me through to completion. Many colleagues and friends have also provided invaluable support and counsel which has sustained and encouraged me through the years. These include Dr Ellinor Olander, Dr Stefanie Williams, Dr Naomi Bartle, Kubra Anwar, Isher Kehal and Kayleigh Kwah, among many others. Of course, this PhD would not have been possible without the contribution of my co-authors, funders and research participants, for which I am deeply grateful. Final thanks go to my husband Ian, and to my parents, Jane and Mike, for their unconditional support and infinite belief in me.
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Autobiographical Context

I have been employed as a full time researcher by the Faculty of Health & Life Sciences at Coventry University since February 2008. The majority of this time was spent working within the Applied Research Centre for Health & Lifestyle Interventions (ARC-HLI), and I currently work as a Senior Researcher in the Centre for Applied Biological and Exercise Sciences (ABES), within the Physical Activity, Exercise & Obesity theme. Throughout my time at Coventry University I have pursued my research interests in the influences on behaviours related to obesity and weight management, and the application of this understanding to the development and evaluation of behaviour change interventions. This body of work has included a wide variety of published studies, within a range of populations and contexts (see Appendices 1-4). However, the work detailed within this portfolio has been selected to demonstrate the specific research I have led in the area of maternal obesity and weight management during pregnancy. The outputs presented here aim to represent my unique contribution to, and advancement of, scientific knowledge in this field of study.

My interest in these areas began when I joined ARC-HLI in 2008 and began working with the Physical Activity & Obesity Interventions Team (POINT), under the leadership of Professor David French and Dr Jemma Edmunds. Prof French was at this time conducting innovative research to identify effective behaviour change techniques and apply these to interventions in primary care, while Dr Edmunds was initiating novel, exploratory research into maternal obesity. Having worked as a research assistant on a number of Prof French and Dr Edmunds’ studies, I developed my own interests in the area of behaviour change during pregnancy, particularly around physical activity and weight management. The experience and knowledge gained in my first 18 months in POINT enabled me to propose and lead my first funded maternal obesity study. At this time Dr Ellinor Olander joined POINT and, sharing my interests in perinatal lifestyle change, we worked together very productively for a number of years to build POINT’s track record in this field, while
also developing our own individual expertise and research outputs. Working so closely together with another researcher in my field undoubtedly enhanced my thinking and research outputs, as we were able to discuss key topics and questions, support and challenge each other. In recent years I have instigated a number of external collaborations and developed enduring partnerships with charities, public health teams and health professionals, in order to further progress my research into obesity and physical activity, both in maternity and in infancy/childhood.

Nature of the problem

Rising levels of obesity globally have led to an increase in obesity among women of reproductive age. It has been estimated that 15.6% of women in England have a Body Mass Index (BMI) $\geq 30$kg/m$^2$ when they become pregnant, with women from deprived backgrounds being more at risk of maternal obesity (Heslehurst, Rankin, Wilkinson et al. 2010). Entering pregnancy with obesity significantly increases the risk of experiencing serious maternal and fetal complications, including gestational diabetes mellitus, pre-eclampsia, stillbirth and macrosomia (Abenhaim, Kinch, Morin et al. 2006). Additionally, women with obesity are twice as likely to die during the perinatal period as those with a healthy weight (Lewis 2007). The costs of caring for obese women during pregnancy and childbirth are also significant (Morgan, Rahman, Macey et al. 2014). Obese women require more specialist obstetric care during pregnancy (Heslehurst, Simpson, Ells et al. 2008), are more likely to experience an assisted delivery (Athukorala, Rumbold, Willson et al. 2010), have a higher number of maternal and neonatal hospital admissions (Denison, Norwood, Bhattacharya et al. 2014), and are likely to have a longer stay in hospital (Galtier-Dereure, Boegner, & Bringer 2000).

There is also an established link between maternal BMI and risk of childhood obesity (Griffiths, Hawkins, Cole et al. 2010; Pirkola, Pouta, Bloigu et al. 2010). Additionally, regardless of pre-pregnancy BMI, gaining excess weight during pregnancy is associated with post-natal weight retention (Siega-Riz, Evenson, & Dole 2004; Rooney & Schaubberger 2002) making this a major risk factor for long term obesity.
As a result of the significant risks to mother and baby of maternal obesity and excess gestational weight gain, public health guidance in the UK advocates promoting healthy lifestyle behaviour change during pregnancy (NICE 2010, 2011).

Background to the research

This portfolio describes research conducted between 2010 and 2014. At the commencement of this body of research, it was apparent that urgent action was required to tackle the maternal obesity issue. Yet, at this time there was a paucity of evidence for what types of interventions would be most effective and what services might be welcomed by or acceptable to women. A number of randomised trials and systematic reviews have been published since 2010 which have begun to develop a knowledge base regarding the efficacy of interventions to limit gestational weight gain and improve maternal and fetal outcomes (Sagedal, Øverby, Bere et al. 2016; Dodd, Cramp, Zhixian et al. 2014; Poston, Briley, Barr et al. 2013; Muktabhant, Lawrie Theresa, Lumbiganon et al. 2015; Hill, Skouteris, & Fuller-Tysziewicz 2013; Thangaratinam, Rogozińska, Jolly et al. 2012; Tanentsapf, Heitmann, & Adegboye 2011). However, outside of research trials, recruiting women to services which support weight management behaviours during pregnancy has proved difficult (Knight & Wyatt 2010). These difficulties in engaging women in weight management interventions were not necessarily anticipated, as several models of behaviour change suggest that major life events may act as a cue to action for health behaviour change (Leventhal, Brissette, & Leventhal 2003; McBride, Emmons, & Lipkus 2003; Janz & Becker 1984) and therefore pregnancy may be an opportune time to offer health-related advice and support. Hence, while evidence regarding the efficacy of interventions is vital, this has little or no value if women do not engage with services once implemented into antenatal care pathways.

Research specifically into weight management and healthy eating during pregnancy was extremely limited at the commencement of the presented body of work, although one study had documented a range of physical (e.g. nausea, cravings, heartburn) social and emotional (e.g. anxiety, bereavement, boredom) and environmental and financial barriers (e.g. restricted income, cooking facilities) to eating a healthy diet during
pregnancy (Tuffery & Scriven 2005). More research evidence existed regarding barriers to physical activity in pregnancy. Barriers identified included practical issues such as lack of facilities, transport and childcare, and physical barriers such as lack of energy and medical complications (Evenson, Moos, Carrier et al. 2009). Additionally, women expressed concern about harming their baby, and although they reported increased motivation for physical activity, including as a means to limit weight gain, this motivation was often insufficient to produce behaviour change (Evenson, Moos, Carrier et al. 2009; Weir, Bush, Robson et al. 2010).

Initial exploratory work conducted by my colleagues and I had also provided some insight into the determinants of women’s diet and physical activity behaviour during pregnancy, and the type of support women would want to help them manage their weight while pregnant (Atkinson & Edmunds 2009; Olander, Atkinson, Edmunds et al. 2011, 2012). These initial studies indicated that women were often unconcerned with weight gain during pregnancy and were reluctant to monitor their weight during a time when it was more socially acceptable to gain weight (Olander, Atkinson, Edmunds et al. 2011). This lack of concern was reinforced by the lack of weight monitoring and advice on weight management by their antenatal healthcare professionals, which indicated to women that weight gain was unimportant. Women also expected to lose weight post-natally, aided by breastfeeding (Olander, Atkinson, Edmunds et al. 2011). Women indicated a preference for detailed information and practical support for diet and physical activity, including services to help with preparing healthy meals, details of safe exercises, and cooking and exercise classes specifically for pregnant women, led by women who had been pregnant themselves (Atkinson & Edmunds 2009; Olander, Atkinson, Edmunds et al. 2012). The role of health professionals was also highlighted, with women stating that they wanted more advice on diet and physical activity from midwives, and wanted midwives to signpost them to local services (Atkinson & Edmunds 2009; Olander, Atkinson, Edmunds et al. 2012).

Thus it was apparent that the needs of women who might benefit from a weight management service were complex and often specific to a short and unique life stage. This lead to the conclusion that research was needed to inform intervention
development and further our understanding of the psychosocial influences on women’s weight-related behaviour during pregnancy. Additionally, as initial attempts were made to provide weight management support services to obese women, this provided the first opportunities to assess the acceptability of such interventions, as advocated by the Medical Research Council’s framework for the systematic development and evaluation of behaviour change interventions (Craig, Dieppe, Macintyre et al. 2008).

Research Objectives
The overall objective of this research was to identify factors which influence pregnant women’s engagement with weight management services, and weight management-related behaviours, by in-depth examination of the issue from multiple perspectives, including; women who have used a service, women who have declined or disengaged from a service, and the antenatal healthcare professionals who facilitate access to services.

Additionally, the research aimed to investigate whether women experience pregnancy as a ‘teachable moment’ for weight-related behaviour change, in order to inform future intervention strategies and advance theoretical thinking regarding behaviour change linked to significant life events.
Introduction to the portfolio of evidence

The portfolio consists of five journal articles, published between 2013 and 2016. The figure below demonstrates the timeline of the research projects from which the publications originate. The articles are presented within the portfolio according to the timeline of when the research was conducted, in order to better illustrate the linkage between studies, the development of understanding, and progression of research questions.

Article 1

Article 2
Atkinson, L., Olander, E. K., & French, D. P. (2013). Why don’t many obese pregnant and post-natal women engage with a weight management service?

Article 3

Article 4

Article 5
Maternal & Early Years Healthy Weight Service (MAEYS) Evaluation

This project was commissioned by NHS West Midlands’ Investing in Health fund to conduct a detailed, qualitative evaluation of MAEYS, at the end of the one year pilot of the service. MAEYS was an individual, home-based service aimed at preventing childhood obesity through supporting obese women with healthy gestational weight gain, post-natal weight loss, infant feeding and the establishment of a healthy family lifestyle.

Just4Mums Service Evaluation

This project was commissioned by Coventry City Council to conduct a mixed methods evaluation of the Just4Mums service, over a period of two years. Just4Mums was a group, community-based service for obese (and latterly overweight) women, aimed at preventing excess gestational weight gain through six, weekly sessions which combined advice on healthy eating and physical activity with instructor-led exercises.

Interpretive phenomenological study of women’s experiences of diet and physical activity behaviour change during their first pregnancy

This project was conceptualised and designed specifically with this PhD portfolio in mind, to investigate some of the issues raised by my prior health services research. It was partially funded by Warwickshire Public Health, as a means to inform the maternal obesity care pathway in Warwickshire.
Article One

Origin and overview

This article presents selected findings from an extensive qualitative service evaluation of the Maternal and Early Years Healthy Weight Service (MAEYS). MAEYS was one of the first evidence-based weight management services for obese pregnant and post-natal women implemented into primary care in the UK. The service was designed as a one to one service, delivered in the woman’s home, from early pregnancy to two years post-natal, providing tailored lifestyle advice and support. The aim of MAEYS was to facilitate dietary and physical activity behaviour change in order to achieve recommended gestational weight gain and promote post-natal weight loss. During a one year pilot of the service across six primary care trusts in the West Midlands, I led on the submission of a tender to conduct a multi-component qualitative evaluation of the service to assess the acceptability to the target population, and identify areas for improvement. We were successful in securing the commission to conduct the evaluation, and as Principal Investigator I managed a team of six researchers over six months to complete the project. The project funding was £35,000 and involved qualitative data collection with 57 participants.

This article reports on the analysis of data collected from 20 women who experienced the service, primarily during pregnancy. Using semi-structured interviews and thematic analysis, the study aimed to provide insight into what the women hoped to gain from using the service, which elements they found most appealing and how they felt the service could be enhanced.

The journal Maternal and Child Health [Impact Factor 1.917, Q1 in Obstetrics & Gynecology, Pediatrics, Perinatology & Child Health, and Public Health, Environmental & Occupational Health] was chosen for submission as the findings were likely to be of broad interest, with implications for designers and commissioners of perinatal weight management services, antenatal and post-natal healthcare providers, and maternal obesity researchers.
Originality and Contribution

In 2010 maternal weight management interventions were in their infancy, with no significant evidence available regarding optimal structure, content and delivery. MAEYS was one of the first evidence-based interventions which reflected the NICE guidelines on perinatal weight management (NICE 2010) to be implemented into the antenatal care pathway, and was specifically informed by some of my early research into women’s needs for a maternal weight management service (Atkinson & Edmunds, 2009). As such MAEYS provided an excellent opportunity to examine in detail women’s experiences of participating in a weight management service as an addition to their usual care.

The evaluation of MAEYS has made a unique contribution to the evidence base on maternal weight management services as the service itself was novel and unique in several ways. Firstly, the service was delivered by non-clinical staff, in the form of health trainers with specialist training in healthy lifestyles during pregnancy, the post-natal period and for infants up to two years old. Other services and trials running at the time were delivered by specialist or research midwives (West 2010; Smith, Taylor, Whitworth et al. 2015). While midwives have several advantages as delivery agents of maternal weight management services, they are a limited and relatively expensive resource. Hence it was of interest to understand whether women would find it acceptable to be supported by a healthy weight advisor without clinical training or experience. Secondly, MAEYS was then, and remains, the only service in the UK to be delivered in the woman’s home. Given the prior research findings which identified significant practical barriers to undertaking weight management/physical activities, the MAEYS evaluation provided an opportunity to explore whether a home-based service would overcome some of the anticipated barriers to engagement with a weight management service, such as lack of transport and childcare. Finally, the duration of the service, and its continuity of support from ante-natal to post-natal and until the infant was two years of age, far exceeded that of any other service, which were mostly limited to either pregnancy or the post-natal period of up to around one year. Although the short duration of the MAEYS pilot (one year) limited the opportunities to assess the impact of this extended and
consistent support, the evaluation was able to explore how this aspect affected the appeal of, and women’s engagement with the service. To date there have been no published evaluations of similar interventions, with the majority of services and trials that have been evaluated delivering group- or clinic-based interventions. Similarly, the majority of published evaluations have utilised mostly quantitative methods in their evaluations (Dodd, Cramp, Zhixian et al. 2014; Poston, Briley, Barr et al. 2013). Hence the present paper not only confirms that ‘one size does not fit all’ but provides information on the potential advantages of the MAEYS service for those seeking to provide an alternative to the group- and clinic-based format.

Author Contributions
As the Principal Investigator (PI) for the MAEYS service evaluation I conceptualised the studies which formed the evaluation, including developing the methodology and data collection tools. I then led a team of researchers in conducting the research. For the present paper I also contributed directly to data collection by conducting a significant number of interviews with service users and undertaking data analysis. I produced the final themes for the present paper and drafted all versions of the manuscript. Professor David French provided oversight and support for the evaluation project, helped to shape the manuscript and commented on all drafts. Dr Olander also contributed to data analysis and commented on all drafts of the manuscript.

Critical reflection and development as a researcher
This evaluation project denotes a significant transition within my research journey, from a Research Assistant contributing to other’s projects, to an independent researcher leading my own studies (which was recognised with promotion to Senior Researcher). I relished the opportunity to devise the study methodology and take responsibility for the complete research cycle. I had to employ considerable project management skills to complete the project within tight timescales, including co-ordinating several researchers, keeping the commissioner updated on progress and resolving problems as they arose, such as issues with data protection and participant recruitment. Conducting the service user study enabled me to further develop my qualitative research skills, both in conducting interviews and focus groups, and
completing thematic analysis. Above all, examining these women’s experiences stimulated my thinking on the wider issue of how to support women to manage their weight in pregnancy and beyond. For example, the results indicated that while women were often motivated towards healthy eating and physical activity during pregnancy, they required the detailed, personalised and sustained support they received from MAEYS to generate strategies and take action. Results also demonstrated that health behaviours related to weight management were not always the biggest concern for pregnant women, and often competed with other demands such as quitting smoking, or managing the physical and psychological effects of pregnancy. I later explored some of these issues in my study investigating the determinants of women’s diet and physical activity behaviour change in pregnancy, reported in Article Five.
Article Two

Origin and overview

This paper reports on another element of the multi-component MAEYS evaluation; the experiences of eligible women who decided not to engage with the MAEYS service, either refusing a referral or prematurely ceasing the service. This study was included within the MAEYS evaluation as most service evaluations typically only reflect the views and experiences of the people who have utilised them, and subsequently may fail to present a balanced assessment of the acceptability of the service to all those who may potentially benefit. At the halfway point of the one year pilot of MAEYS, when the qualitative evaluation was initiated, it was clear that only around half of women offered the service participated in at least one session, and of the women who initially engaged with the service, a significant proportion failed to participate in at least 75% of the planned sessions. As such, the present study sought to explore the reasons behind women’s decisions not to accept a referral to the service, or to cease use of the service, in order to identify possible changes to MAEYS which would increase uptake and maintain engagement for the duration of the planned service.

The Journal of Reproductive and Infant Psychology [Impact Factor 0.886, Q2 in Psychology (misc), Reproductive Medicine, and Obstetrics & Gynaecology] was chosen for publication as the findings revealed that women’s decisions were based less on the service itself and more on their attitudes towards being offered such a service, and their motivation towards and beliefs about weight management during pregnancy and beyond. As such, the psychological elements of the present paper would likely be of interest to this journal’s readership.

Originality and Contribution

As stated above, service evaluations rarely include the views and experiences of those who chose not to engage with that service. While my colleagues and I had investigated what women said they wanted from a weight management service (Olander, Atkinson, Edmunds et al. 2012; Atkinson & Edmunds 2009), this study provided an opportunity to investigate whether these findings were reflected when
women were actually offered a service which was designed with consideration of these expressed preferences. The findings from the present study reflected that some of the pragmatic barriers to engaging with a pre- and post-natal weight management service were relevant to MAEYS. These included a lack of time, particularly due to family commitments, and a lack of willpower to carry out behaviour change. Positively, barriers such as lack of transport or childcare were not identified within this study, demonstrating that a home-based service was able to overcome at least some of the obstacles to participation.

Often, where data is collected regarding reasons for refusing the offer of a service, this is limited to a single multiple choice question, and therefore provides limited insight into the decision-making process and the relative influence of multiple factors on an individual’s choices. By utilising qualitative methodology, we were able to give participants the time and opportunity to fully describe their experience of being offered or using the service, and to explore and explain their reasons for declining or ceasing the service. As a result, this innovative study revealed significant barriers to uptake which were not evident from any other source, and in many cases had not been anticipated. Of particular interest were the findings around the impact of the referral experience, which revealed that some women had declined the service due to the way the service was introduced, rather than considering whether participation might be beneficial to them. This is vital information for service designers and professionals who might be asked to refer to or introduce a weight management service to potential users. The referral process is relatively easy to improve, or get right from the start, compared to overcoming some of the other barriers to using the service, such as lack of time or a preference for a different format. As such, these findings provide invaluable information for current and future intervention providers around the need for referrers to approach the subject sensitively, and to have and be able to communicate sufficient information about the service to potential users. Addressing these areas could significantly increase service uptake and retention.

This study provided a unique insight into obese women’s psychological and emotional responses to being referred to a weight management service, as well as
again highlighting that some women do not want or feel able to focus on weight management during pregnancy. To date the only other similar study of women who had declined or disengaged from a pre- or post-natal weight management service has been conducted by my colleagues and I (Olander & Atkinson 2013).

Author Contributions
As previously mentioned, I was the Principal Investigator (PI) for all the studies which formed the MAEYS evaluation. I therefore developed the methodology and data collection tools for this study, and led the team of researchers who conducted data collection and analysis, including my co-author Dr Ellinor Olander. For the present paper I contributed directly to data collection by conducting a significant number of interviews with women who had declined or disengaged from the service, and I also undertook analysis of the collected data. I produced the final themes for the present paper and drafted all versions of the manuscript. Professor David French provided oversight and support for the evaluation project, helped to shape the manuscript and commented on all drafts. Dr Olander also contributed to data analysis and commented on all drafts of the manuscript.

Critical reflection and development as a researcher
This study was particularly challenging due to the nature of the participants’ relationship with the service being evaluated. Potential participants had to be approached sensitively and assured of both the independent nature of the research team, and the value of their contribution. While I had anticipated that recruitment would be difficult, this certainly proved to be the case, with only around 18 participants recruited across both samples, against a target of 24. This gave me valuable insight into recruiting hard to reach groups, which has proved useful in other studies. Additionally, the interview schedule had to be carefully designed, with little a priori knowledge of women’s experiences, and interviewers had to employ significant skill in conducting the interview to elicit information without appearing to be critical of the women’s choices. For this reason, I personally conducted the initial interviews for these samples in order to test the schedule and guide others in the
research team. While I also conducted many of the later interviews, I likewise felt confident to ask other researchers to collect data for this study, an important step towards becoming a research leader. After initial examination of the data I decided to combine the datasets from both samples for final analysis and presentation, as I felt there were interesting contrasts and similarities between the two groups’ experiences. The acceptance for publication of the present paper in this format reassured me that this was a good decision.

As with Article One, the present study further informed my thinking on weight management in pregnancy and beyond. Particularly, the findings further highlighted to me the important role of health professionals in engaging obese women not only with services, but with the issue of weight management as a whole. Additionally, the present results reinforced the finding that many women feel unmotivated towards weight management during pregnancy, and led to questions regarding the underlying reasons for this, which I would attempt to answer in future studies.
Article Three

Origin and overview

When designing both the MAEYS and Just4Mums service evaluations it was clear that midwives, as primary antenatal care-givers and referral agents for antenatal services, not only played a pivotal role in the operation of these services but were also likely to be an invaluable source of information regarding how women responded to the offer of weight management support. Although continuity of care in midwifery is an ongoing issue due to resource limitations, community midwives strive to build and maintain a relationship with the women in their care over the course of their pregnancy and into the early post-natal period, and so also have the potential to report on women’s experiences of weight management services they attend. Therefore, interviews with referring midwives were included as an integral part of the evaluation of both services.

The aims of these elements of the service evaluations were twofold. Firstly, to evaluate the referral process, understand midwives’ views of the service and assess whether improvements could be made to either. We considered this important as our previous work had suggested that women’s weight management beliefs and behaviour are greatly influenced by their midwife’s advice and behaviour, i.e. if women are not weighed by their midwife and the topic isn’t discussed at their antenatal appointments then it must not be important (Olander et al., 2012). Therefore, it is vital to understand how midwives introduced the topic, how they described the service and if and how they encouraged eligible women to attend. Secondly, these studies aimed to elicit an overview of women’s responses to the offer of the service, and the unique insight midwives have into women’s reasons for engaging, or not, with these services. It was anticipated that not only would these midwives be discussing the services with a larger number of women than the research team would be able to include in the evaluation, they would be speaking with women who would not be inclined to participate in the service evaluation. As such, it was hoped these studies would provide additional insights into women’s views and experiences of weight management services that would not be revealed by other elements of their respective evaluations.
The present paper combines and contrasts the results of both studies. Having reported these studies separately within the relevant research reports, I was already aware of some similarities and differences. I subsequently presented the combined results at the Society of Reproductive and Infant Psychology Annual Conference in 2013, and found that when taken together these findings had important implications for both designers of weight management services and midwifery teams. I therefore combined the results for a paper in the journal Midwifery [Impact Factor 1.861, Q1 in Maternity & Midwifery, Q2 in Obstetrics & Gynaecology]. This journal was chosen as it is both practitioner-focused and a well-respected source for researchers and commissioners of maternity services.

Originality and Contribution
As previously mentioned within this critical overview, few evaluations of weight management services delivered within a usual antenatal care setting have been conducted and the studies upon which the present article reports are the only studies of midwives’ views and experiences of referring women to such services in the UK. Intervention trials such as UPBEAT (Poston, Briley, Barr et al. 2013) and The Lifestyle Course (Smith, Taylor, Whitworth et al. 2015) have used research midwives to recruit women into the trials and have not investigated how midwives would incorporate referral to a local weight management service into their practice. The present paper is also unique in comparing two very different services, revealing both unique and universal barriers to referral. Hence the present article provides designers and providers of similar services with vital information to inform their referral processes, helping them to both build positive partnerships with midwives and maximise uptake of their service.

Additionally, the present paper adds to the more general literature around midwives’ attitudes towards obesity and weight management within antenatal care. Several studies have reported that midwives believe that obesity and weight management are sensitive topics and they have significant concerns regarding raising the issue with obese women (Heslehurst, Russell, McCormack et al. 2013; Macleod, Gregor, Barnett et al. 2013). These concerns centre around the possibility of offending women and damaging the woman-midwife relationship, as well as
increasing the risk that women will not attend antenatal appointments if offended, which will in turn reduce the midwife’s ability to support that woman and reduce the risk of negative outcomes for that pregnancy. Midwives often report that these concerns are exacerbated if they are overweight or obese themselves, and also express apprehension regarding the psychological impact on women of focusing on weight during pregnancy. Hence the present article highlights how these concerns impact on midwives’ practice when asked to refer women to a weight management service. Finally, the present article highlights an issue not limited to referral to weight management services, that of how midwives view and approach informing women of risk factors and services designed to provide support to reduce those specific risks. The fact that the research was carried out between 2010 and 2013 and accepted for publication in 2016 suggests that the findings are still unique and relevant.

Author Contributions
As previously mentioned, I was the Principal Investigator (PI) for all the studies which formed the MAEYS evaluation. I therefore developed the methodology and data collection tools for this study, conducted many of the interviews and analysed the data collected from midwives. Within the Just4Mums evaluation, as well as contributing to the overall evaluation design and conduct, I was personally responsible for the study of midwives’ experiences of the service. I designed the data collection tools, conducted all the interviews and the focus group, and analysed the data. For the present paper I combined and re-analysed the two datasets, producing the final themes and drafting all versions of the manuscript. Professor David French provided oversight and support for both the evaluation projects, helped to shape the manuscript and commented on all drafts. Dr Ellinor Olander contributed to data analysis for both projects and commented on all drafts of the manuscript. Diane Ménage is a registered midwife and midwifery educator and researcher at Coventry University and I asked her to contribute her extensive knowledge and experience to the present paper. Ms Ménage reviewed and contributed to the final themes and commented on all versions of the manuscript.
Critical reflection and development as a researcher

In the UK, midwives are such an integral element of antenatal healthcare and have the potential to significantly influence the beliefs, norms and behaviour of all parents, that I considered it to be vital to include evidence from midwives when attempting to understand weight management behaviour in pregnancy. While previous studies had revealed midwives’ general apprehension at raising the issue of obesity and suggested they would welcome the option to refer women to specialized support, the two studies which form the present article were excellent opportunities to explore in some depth how midwives approach the issue of the risks associated with weight management when they have a real service to offer women. The insight that midwives were able to provide through their accumulated experience of discussing weight management and services with large numbers of women of different body compositions, backgrounds and cultures is invaluable in generating a full picture of the barriers and facilitators of engaging with weight management during pregnancy.

Personally these studies also offered me the opportunity to gain further experience of conducting qualitative research with health professionals, which requires subtly different approaches to recruitment, data collection and analysis. In particular, this entailed adapting the data collection methods to work around midwives’ busy, mobile and often unpredictable working environments, plus reflecting on their views and behaviour in the context of clinical guidance, policy and resource restrictions as well as their own professional experience and judgements.

Finally, the findings from these studies further informed my thinking regarding the potential determinants of women’s engagement with weight management and weight management services. Specifically, midwives often mentioned that they were more likely to raise the issue of weight management and/or offer a service to women experiencing their first pregnancy. This was explained as being because women in their second or third pregnancy were likely to replicate their behaviour from previous pregnancies (regardless of the positive or negative outcomes experienced), and were perceived to be less open to advice. I was therefore interested in understanding how women in their first pregnancy experienced advice
on weight management and healthy lifestyles, and what other influences there were on their decision-making regarding their lifestyle during that first pregnancy. Both women and midwives reported that there was good awareness of the benefits of a healthy diet, and to a lesser extent physical activity, during pregnancy, yet both groups also reported a lack of motivation towards making changes to these behaviours. I was therefore interested to investigate whether there existed a genuine lack of motivation, or whether there were other psychosocial factors that reduced their engagement with weight management and associated behaviours.
Article Four

Origin and overview

The study described in this short report was included in the Just4Mums service evaluation as a direct response to the findings of the MAEYS evaluation described in Article Two. Many of the women who had declined or disengaged from MAEYS had described a negative experience of being referred to the service and cited this as a key reason for not engaging with it. While conducting the Just4Mums evaluation, we observed that high numbers of women had been referred but only a small percentage of these had gone on to attend the service. The aim of the present study was to examine women’s referral experiences and establish whether these had influenced their decision not to attend Just4Mums. The present study formed part of a wider study of women’s reasons for declining the Just4Mums service, which replicated the study reported in Article Two (Olander & Atkinson 2013). Hence, data specifically relating to the referral experience was extracted from transcripts of interviews for the wider study, and analysed thematically.

The resulting paper was submitted to the journal Sexual and Reproductive Healthcare [Impact Factor 1.211, Q1 in Maternity & Midwifery, Q2 in Obstetrics & Gynecology]. This journal was chosen as its target audience includes clinicians, practitioners, social scientists and policy-makers. Additionally, one of our previous studies had been published within it, and had been well-cited since publication.

Originality and Contribution

This small, focused study was conducted with the aim of providing additional evidence on pregnant women’s experience of referral to weight management services. By replicating the study described in Article Two we were able to investigate whether the negative experiences reported by women in the original study were unique to the MAEYS service. Our findings showed that the women who declined Just4Mums were not only not offended or upset by the referral, they were pleased to have been made aware of the service by their midwife. These findings demonstrated that it is possible to create a positive or neutral referral experience when offering pregnant women a weight management service, thereby enabling
service providers to focus on removing other barriers to engagement, such as pragmatic issues like timing and location, and low motivation. When combined with the findings from Article Three, which compared midwives’ approach to referral, it is possible to identify potential factors which might influence women’s positive or negative response to being offered a weight management service. These include the level of detail midwives are able to provide when describing the service, which as a standardised and more traditional service would have been easier for midwives referring to Just4Mums. It is also apparent that many women declined the Just4Mums service based purely on the difficulties of attending a daytime, weekly programme at a community location, and therefore they likely did not enter into detailed discussion with their midwife regarding the service. As many of these practical barriers did not exist for MAEYS, women may have more carefully considered the reasons for the referral, generating a deeper emotional response.

Finally, as the studies took place over two years apart, it is also likely that midwives had acquired further knowledge regarding the issue of maternal obesity, and had more experience in sensitively raising the issue with women, thereby improving their competence in referring to weight management services.

The consistent inclusion of non-participants within service evaluation has become a feature of my research, and the value of the data obtained through these studies is clear. This paper, along with others which report on reasons for declining or disengaging from services (Olander & Atkinson 2013; Atkinson, Olander, & French 2013), enable distinct recommendations to be made for future service provision. Such studies also provide unique insight into the psychological factors that influence decision-making when offered a weight management service. Subsequent study and consideration of these factors can make a significant contribution to improving uptake and impact of such services.

Author Contributions
Although Dr Ellinor Olander was the PI for most of the Just4Mums evaluation, the methods for the present study closely mirrored those devised for the MAEYS evaluation. Chloe Patel was a student on the MSc Health Psychology course at Coventry University in 2013 and completed an internship with me and Dr Olander,
working on various maternal obesity-related projects. Ms Patel took the lead on data analysis for this study and wrote the initial drafts of the manuscript, under the supervision of Dr Olander and myself. Dr Olander and I provided guidance on how to conduct thematic analysis and agreed the final themes. Following initial peer review of the submitted manuscript, having concluded her Masters Degree and found employment, Ms Patel did not have capacity to re-draft the paper. I therefore made final revisions and re-submitted to the journal.

Critical reflection and development as a researcher

Although the present article is a relatively small piece of work, it is included in the portfolio as demonstration of both the progression of my research, and my progression as a researcher. Formerly, the replication of my previous work within the present study demonstrates the value of this methodology and of evaluating a service from multiple perspectives. Latterly, my supervision and guidance of a junior researcher to achieve not only the production of a valuable piece of research evidence but a short report published in a good quality, peer-reviewed journal, demonstrates my growing confidence and expertise as an independent researcher.
Article Five

Origin and overview

The final article in this portfolio describes an in-depth, exploratory qualitative study which was conceptualised as a direct result of reflection on the results of the MAEYS and Just4Mums evaluation, as well as additional quantitative research I conducted on women’s physical activity behaviour during pregnancy [Supplementary Articles 1 and 2: (Atkinson, Parsons, & Jackson 2014; Atkinson, Jackson, & Hodges 2014)]. The evidence accumulated through this prior work suggested multiple and significant barriers to adopting positive dietary and physical activity behaviours during pregnancy, which appeared to challenge the commonly cited belief that pregnancy is a good time for behaviour change. As a result, I wanted to investigate in detail whether the proposed conditions to create a “teachable moment” for health behaviour change (McBride, Emmons, & Lipkus 2003) were actually experienced during pregnancy, as was often asserted (Phelan 2010) such as an increase in motivation towards health and regular contact with health professionals who can provide relevant advice. Even where these conditions did exist, my previous findings suggested that other factors may exert a more powerful influence on women’s behaviour. Midwives had already reported that many women pay ‘lip service’ to the offer of a weight management service, through a desire to be seen as a good mother, but they actually had limited intention to attempt behaviour change that would contribute to healthy weight management (Atkinson, French, Ménage et al. In press).

Hence, I decided it would be important to choose a methodology that would facilitate a deep exploration of women’s thoughts, perceptions and choices, and that it would be best to approach the question of teachable moments indirectly. I chose to use Interpretative Phenomenological Analysis (IPA) as the methodological framework to support these aims. Additionally, as previous findings had suggested that women in their second or subsequent pregnancy would already have established behaviour patterns for pregnancy, I decided to focus only on women experiencing pregnancy for the first time, thereby reducing the influence of past experience and habitual behaviour. Thus, the present study sought to explore in
detail the lived experience of a first pregnancy and the process of making decisions about diet and physical activity during this time, including how women sought and responded to a variety of information sources.

I chose to submit the present article to the British Journal of Health Psychology [Impact Factor 2.895, Q1 in Applied Psychology] as I considered the findings to be a valuable addition to the evidence for the theorized determinants of health behaviour, and be of significant interest to psychologists and researchers.

Originality and Contribution
As the most in-depth study published to date of the phenomenon of diet and physical activity decision-making and behaviour during a first pregnancy, the present article describes significant new findings. While partially supporting the Teachable Moments model, the results also indicated that women with healthy, uncomplicated conception and pregnancy experiences may base their diet and physical activity choices primarily on automatic judgements, physical sensations and perceptions of what pregnant women are supposed to do. In turn, this suggests limited opportunity for health professionals to intervene and subsequently influence behaviour, and may provide some explanation for a lack of engagement in weight management services.

As discussed within the article, the evidence for reliance on impulsive processes is novel but may be explained by a number of factors relevant to a first pregnancy, including depleted self-regulation resources, high cognitive load and the positive mood generated by excitement of impending parenthood combined with the lack of complications. The paper concludes that further research is needed to establish why women might rely on primarily non-reflective decision-making at this time.

Additionally, if the findings are generalizable to other women with uncomplicated pregnancies, this has significant implications for intervention development. For example, interventions would need to include strategies to either create the necessary conditions to enable women to access their reflective processes, or to influence the impulsive precursors to behaviour, such as the pre-learned association between pregnancy and certain behaviours.
Finally, the article also notes the evidence for a strong social influence on the women’s behaviour. In contrast to the stigma associated with smoking and alcohol use during pregnancy, women faced no social pressure to follow a healthy diet or be physically active, and subsequently allowed themselves to relax their usual healthy lifestyle, despite understanding at least some of the potential benefits to themselves and their baby of maintaining a healthy diet and regular activity. It is therefore likely that to increase women’s engagement with weight management behaviours and services, significant efforts will need to be made at a population level to address social norms around diet and physical activity during pregnancy.

The present article challenges much of our previous understanding of around behaviour change in pregnancy and has implications beyond the realm of weight management. Findings also add to our understanding of the concept of teachable moments for health behaviour change, and how this can be applied to the unique life stage of pregnancy.

Author Contributions

Having formulated the overall aim and research question for this study, and chosen IPA as the most appropriate methodology, I approached Dr Rachel Shaw to collaborate with me. Dr Shaw is a recognised expert in the application of IPA, with experience of conducting research in the perinatal period. Based on the ideas and questions described above, I refined the research questions and overall study design with input from Dr Shaw and Professor David French. Dr Shaw later contributed to the data collection methods and provided guidance on the analysis process. I completed all of the interviews and data analysis independently. Draft themes were then discussed with Dr Shaw and Prof French separately and I then decided on the final themes. I drafted all versions of the manuscript, incorporating comments from Dr Shaw and Prof French with each subsequent version. Following peer review I completed final revisions, with additional input from both co-authors, and submitted the accepted version of the article.
Critical reflection and development as a researcher

The present study was by far the most challenging I had undertaken to date. I invested significant time in familiarizing myself and becoming confident with the IPA methodology. This included reading key texts and articles on similar studies, attending workshops, and discussions with other IPA researchers. The nature of IPA necessarily requires the researcher to interpret participants’ accounts and I initially struggled to trust my explanations of participants’ motivations, beliefs and actions. However, with practice (and reassurance from Dr Shaw) I began to recognize that my years of experience in qualitative research with pregnant women, knowledge of the wider literature and understanding of the theoretical determinants of health behaviour, enabled me to make reasoned, informed interpretations. Although both the analysis and write-up process were lengthy and demanding, I am extremely proud of the resulting article and believe it provides genuinely new and important insight.

In addition to mastering a new qualitative methodological framework, this study also afforded me an opportunity to formally examine a model of behaviour change, in relation to the phenomenon of weight-related behaviour change in pregnancy. By relating my findings to the Teachable Moments model I was able to break down my results and reflect on the potential influences on women’s decisions and behaviour. This in turn added credibility to my arguments and conclusions. Although IPA is not typically used to explicitly investigate theoretical ideas, for this study it was a very effective methodology. Here IPA facilitated exploration of the underpinning motivations and influences on behaviour, by removing a priori assumptions and as much as possible bypassing social desirability, by not asking women directly about the concept of teachable moments or pregnancy as a cue to action. I was then able to view the women’s experiences through the lens of the Teachable Moments model during analysis. Once my analysis was completed I was also able to draw on another model, the reflective-impulsive model of social behaviour proposed by Strack & Deutsch (2004) to further explicate my results. Whereas my research to this point had been informed by several widely used models of behaviour change, such as
social cognition models, the present study marks a progression in the direct use of specific theoretical models to inform both study design and data analysis.
Conclusions and Future Work

The work presented within this portfolio makes a significant contribution to the evidence base on weight management in pregnancy, in a number of ways. Firstly, it provides valuable information for designers and providers of maternal weight management interventions. Articles relating to the MAEYS evaluation demonstrated that a novel home-based, tailored service was welcomed by obese women. Importantly, this work demonstrated that the unique MAEYS design was able to overcome commonly reported barriers to engagement in weight management services in pregnancy, and hence provides an alternative model to the group-based community interventions and specialist midwifery clinics that have been trialled or implemented in recent times. Although a full assessment of the cost-effectiveness and efficacy of MAEYS is lacking (and would be extremely valuable), figures from the quantitative evaluation of the MAEYS pilot suggested that obese women who used the service limited their gestational weight gain to levels which would reduce the risks of developing serious complications (Baker 2011). Additionally, the direct costs of providing the service were estimated at £256 per client (Baker 2011). This compares favourably with a midwife-led one to one service in Sweden, where direct costs were estimated at around £1093 (de Keyser, Josefsson, Monfils et al. 2011). The increased healthcare costs associated with pregnancy and childbirth for an obese woman compared to a woman with a healthy BMI have been estimated to be between £202-£350 (Denison, Norwood, Bhattacharya et al. 2014), and £1171 (Morgan, Rahman, Macey et al. 2014), and it has been estimated that increased healthcare utilisation by infants born to obese mothers could equate to a cost of £1138 in their first year (Morgan, Rahman, Hill et al. 2015). Hence, while one to one interventions are often discounted by commissioners on the basis of costs, the MAEYS service model has the potential to produce significant return on investment.

Even if the MAEYS model is not adopted in its entirety, there are still valuable lessons to be learned from the work in this portfolio. This includes the need to very carefully consider how women are introduced to the service, which in turn is likely to require training and ongoing engagement with midwives and other referring professionals. This should ensure that women’s information needs are met and that
referral agents are confident to recommend services, based on reliable evidence of efficacy. The work currently being conducted by Nicola Heslehurst and colleagues to develop theory-based midwife training on maternal obesity and weight management (Heslehurst, Crowe, Robalino et al. 2014; Heslehurst, Russell, McCormack et al. 2013) should contribute greatly to the ongoing development of midwife education. However, the article within this portfolio on midwives’ views and experiences of referring to weight management services has highlighted some wider questions around midwifery practice, and the role of the midwife in promoting supplementary, lifestyle-related services. Undoubtedly, further close collaboration between the researchers of behaviour change in pregnancy, the commissioners and providers of weight management services, and midwives, is necessary to identify how midwives can be further supported to effectively communicate the potential benefits of weight management, within the context of woman-centred care.

Additionally, the preferences of both women who used MAEYS and those who did not, suggest that regular weight monitoring would be a valuable element of any weight management service. As those women who declined to use a weight management service likewise expressed a desire to have their weight monitored, this may also be a beneficial addition to standard antenatal care. UK clinical guidance in place since 2010 (NICE 2010) does not recommend routine weight monitoring during pregnancy for most healthy weight or obese women, and concerns about deleterious consequences of focusing on weight gain during pregnancy (such as the development of disordered eating) have been voiced. However, a recent pilot of routine weight monitoring and feedback by community midwives during usual antenatal care appointments demonstrated good acceptability to both midwives and women, and indicated potentially significant reductions in excess gestational weight gain (Daley, Jolly, Jebb et al. 2016). Importantly, women who participated in the pilot demonstrated no evidence of a negative impact of weight monitoring on their psychological well-being.

One theme that runs through all of the work in this portfolio, and is most illuminated by the final article, is the low levels of intention to follow a healthy diet, be physically active, and in turn manage gestational weight gain. While midwives reported ‘lack of
motivation’ in many women, the studies with women indicate a more complex picture. In fact, many of the women in our studies reported wanting to eat healthily, linked to a belief that this would be beneficial for their unborn baby, and a desire to stay active as a means of not gaining too much weight. However, the studies within this portfolio have demonstrated that this motivation alone is often insufficient for women to action their intentions, or even to form distinct intentions. For example, the women in our IPA study struggled to recall or articulate specific examples of making dietary or physical activity choices. Instead their actions were a replication of what they perceived was good or normal for a pregnant woman, with no reasoned assessment of pros and cons, and no detailed planning of how to perform a desired behaviour. Where intentions were formed towards a specific behaviour, these were easily diverted by external drivers such as bodily signals. Research into the determinants of behaviour change consistently indicates a strong relationship between intentions and behaviour (Hagger, Chatzisarantis, & Biddle 2002; McDermott, Oliver, Simnadir et al. 2015), and that behaviour change attempts are more likely to be successful where detailed plans are made regarding how to achieve the desired behavioural goal (Scholz, Schüz, Ziegelmann et al. 2008; Reuter, Ziegelmann, Wiedemann et al. 2008). Hence, rather than assuming that pregnancy is a good time for behaviour change, based on increased motivation towards health, this portfolio has highlighted the need to examine the multitude of other factors which influence women’s behaviour during this unique life stage. A recent article I co-authored, partially inspired by discussion of the results of our IPA study, has used the COM-B model to exemplify the multiple factors which may need to be addressed to facilitate behaviour change during pregnancy [Supplementary Article Three (Olander, Darwin, Atkinson et al. 2016)].

Policy context

There have been significant political and economic changes throughout the timespan of the present body of research. The Health and Social Care Act 2012 led to the transition of responsibility for commissioning most public health services from the NHS to local authorities, alongside the establishment of Public Health England as an executive agency of the Department of Health. Both the anticipation of these
changes, and the initial bedding-in period of public health teams into local and county councils, resulted in significant uncertainty and hesitation around the commissioning of weight management and healthy lifestyle services. While Health and Wellbeing Boards and Strategies were established some services were reduced, while others were unable to develop or expand. This contributed to the failure to capitalise on the early promise of MAEYS, as public health teams were unable to secure long term funding. These changes also restricted the options available to the commissioners of Just4Mums, meaning that learning from earlier research (such as the MAEYS evaluation) could not be fully incorporated into this new service. This highlights the challenge of translating evidence into practice in a period of upheaval and uncertainty.

Concurrently, austerity measures introduced in the newly elected coalition government’s spending review of 2010 have had far-reaching implications for spending on public services, with local authorities under pressure to achieve year on year savings through efficiencies and more creative and targeted commissioning. While assessments of the impact of austerity since 2010 (Joseph Rowntree Foundation 2015; The Kings Fund 2015) suggest that local authorities have been fairly successful in protecting vital services, they also highlight several negative effects of spending cuts which are relevant to the maternal obesity issue. For example, services have become more narrow in scope and more targeted towards those in most need, usually those living with the highest levels of deprivation. While there is a clear link between obesity and deprivation (Heslehurst et al. 2007; McLaren 2007), the lack of universal services to support healthy lifestyles and weight management in pregnancy reduces the opportunities to create the significant shift in both beliefs and behaviour necessary to improve outcomes across the whole population. Similarly, the pressure to reduce spending has shifted the focus away from long term preventive measures, to short term cost savings. As the most significant benefits of successful weight management in pregnancy will only be evident in the reduced risk of obesity and associated ill health in the offspring, this makes it challenging to make a case for investment in maternal weight management services.
Finally, the increasing strain on midwives in recent years must also be acknowledged when considering the findings summarised in this portfolio. Along with local authorities the NHS employers of midwives have been placed under pressure to make extensive cost savings since 2010, while facing increasing demands on midwifery services resulting from the changing demographic of childbearing women in the UK (Royal College of Midwives 2015), including rising obesity levels. Additionally, most trusts are failing to meet the recommended staffing levels for midwives, and this situation is likely to be exacerbated by the imminent retirement of a large proportion of the current midwifery workforce (RCM, 2015). These constraints on midwifery resources represent an important barrier to large scale behaviour change.

Critical reflections on the portfolio

In bringing together this body of work I have endeavoured to critically reflect on the progression of ideas and research studies, and consider whether I would approach the investigation of these topics differently. My early work in this field was very much focused on developing behaviour change interventions for obese pregnant women and building an evidence base to inform weight management services. Consideration of these early studies with the benefit of hindsight reveals that they were very much premised on the assumptions that a) women may be unaware of the risks of excessive gestational weight gain and/or appropriate behavioural strategies to manage their weight effectively during pregnancy, and b) that making women aware of the risks and providing advice and support on weight management would both increase women’s intentions towards weight management and facilitate behaviour change. While these assumptions were supported by a number of established models of health behaviour, such as Protection Motivation Theory (Rogers, 1983) and the Common Sense Self-regulatory Model (Leventhal, Brissette, & Leventhal 2003), the research in this portfolio suggests that weight management in pregnancy is extremely complex. For example, women who chose not to use MAEYS were often aware of the benefits of a healthy lifestyle, while those that did were not always able to achieve significant behaviour change, despite receiving advice and support. Therefore, while my service evaluation work rightly focused on
acceptability, this was perhaps a missed opportunity to investigate the factors which influenced women’s intentions to pursue weight management strategies. If I were to repeat these studies in 2016, I would likely employ elements of the Behaviour Change Wheel approach (Michie, van Stralen, & West 2011), a theoretical framework which would facilitate a more comprehensive evaluation. This would include specifically investigating how the women’s perceptions of their capability, opportunity and motivation (COM-B: Michie, van Stralen, & West 2011) towards weight management-related behaviours influenced both their decision to engage with the service, and their behaviour change attempts or lack thereof. Similarly, I would attempt to unearth which specific behaviour change techniques (BCTs) resonated with service users, for example using taxonomies of recognised BCTs e.g. BCTT v.1 (Michie, Richardson, Johnston et al. 2013), as I have developed expertise in such methods in recent years.

Similarly, if I were to repeat my investigation of the referral of women to weight management services, having identified the varied approaches taken by midwives, a number of additional methods could be employed to further illuminate the role of both midwives and the referral experience in women’s engagement with weight management behaviours and services. For example, observations of the appointment where referrals are made, and interviewing women directly after the appointment to gather their perceptions of the midwife’s behaviour and how this influenced their decisions.

Future directions

While the work presented in this portfolio has illuminated several aspects of weight management and behaviour change in pregnancy, it has also raised many questions and indicated several areas which warrant future investigation.

Firstly, it would be valuable to develop our understanding of the proposed causes of women’s reliance on impulsive processes, e.g. depleted self-regulation resources, high cognitive load, positive mood, etc. in order to identify ways to activate reflective processes with regard to weight management and lifestyle behaviours. This is likely to require detailed cognitive and experimental research, but without the
capacity to tap into these reasoned processes, our ability to develop effective behaviour change interventions is severely limited.

Secondly, the work detailed in this portfolio indicates a strong and multi-faceted social influence on women’s behaviour during pregnancy, which also needs to be better understood and addressed. In the general population, gaining a lot of weight, eating unhealthy food and reducing or avoiding physical activity are all viewed as undesirable, and may be associated with negative personality traits such as laziness. Yet these are all far more socially acceptable during pregnancy, despite proven health implications for mother and baby. Additionally, the reticence of health professionals to raise the subject of weight management is rooted in the social stigma of overweight and obesity (Bombak, McPhail & Ward 2016). This includes the potential for women to feel judged or offended, and the concern that the health professionals’ own excess weight will reduce their credibility to provide or refer to weight management support (Heslehurst et al. 2013). Finally, it seems that much behaviour during pregnancy is socially learned (Atkinson, Shaw & French, 2016). As such, without intervention, future generations are likely to replicate much of the negative behaviour we see today. Detailed investigation of the origins and relative influence of these societal factors on women’s behaviour during pregnancy would provide the necessary knowledge to effectively target interventions at a societal level. This may include raising awareness of the negative consequences of maternal obesity and excess gestational weight gain, mirroring the shift in knowledge and attitudes towards smoking in pregnancy in recent years. Normalising weight monitoring and weight management during pregnancy for women of all weight categories would likely reduce the chances of causing offence, and subsequently increase health professionals’ confidence to provide or refer to weight management support. However, it is important that any work to change social norms and attitudes towards weight management does not have unintended consequences, such as increasing stigma and discrimination towards overweight and obese women.

Finally, my work combined with that of other researchers has now provided a thorough understanding of the acceptability of perinatal weight management services, and the important considerations for service designers and providers.
Future research should focus on identifying and evaluating innovative solutions to overcoming the established pragmatic barriers to engagement in these services, ideally using a framework such as the Behaviour Change Wheel approach. This might include the use of technology to make the service more convenient, or integrating add-on weight management support into the antenatal care pathway. Additionally, we need to move beyond acceptability and use the evidence we have accumulated to date to inform further studies which will unveil the most fruitful BCTs for this very unique and important population.
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NICE. (2011). *NICE Weight management before, during and after pregnancy (CMG36)*. London: NICE.


*Applied Psychology, 57,* 194-207.


Appendix One – Portfolio outputs in numerical order

Article One


Article Two


Article Three


Article Four


Article Five

Appendix Two – Supplementary outputs


Appendix Three – Additional research outputs relevant to the portfolio

Articles in peer-reviewed journals


Atkinson, L., Olander, E.K. & Smith, D.M. (2013) Review of a Division of Health Psychology funded research seminar: ‘Weight is the new challenge’: how can health psychology help maternity care professionals to support women to have a healthy weight and lifestyle in pregnancy? Health Psychology Update, 22(2), 27-30


Presentations at national and international scientific conferences


presentation at the International Society of Behavioural Nutrition & Physical Activity Annual Conference, Edinburgh, Scotland.


Acceptability of a Weight Management Intervention for Pregnant and Postpartum Women with BMI ≥30 kg/m²: A Qualitative Evaluation of an Individualized, Home-Based Service

Lou Atkinson · Ellinor K. Olander · David P. French

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Why don’t many obese pregnant and post-natal women engage with a weight management service?

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Midwives’ experiences of referring obese women to either a community or home-based antenatal weight management service: Implications for service providers and midwifery practice

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Short communication

An exploration of obese pregnant women’s views of being referred by their midwife to a weight management service

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Abstract

Midwives have previously reported concerns about discussing and referring obese pregnant women to weight management services, with some women stating that this referral can be upsetting. The current study interviewed obese women who had declined a weight management service during pregnancy to explore if it was the referral process that made them decline the service. Fifteen women participated and reported that being informed about and referred to a service by their midwife was acceptable to them. Participants also mentioned they would expect this information from their midwife. No participants reported being upset by this referral.

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Is pregnancy a teachable moment for diet and physical activity behaviour change? An interpretative phenomenological analysis of the experiences of women during their first pregnancy

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