

**What works for whom and in which circumstances?**

**A realist evaluation of a complex intervention for pregnant  
women with obesity**

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## **Certificate of original authorship**

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Jane Raymond

10 May 2016

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## Conference Presentations

**Raymond, J.** (2008). *Layers of Evidence: a Contemporary Debate on Obesity in Pregnancy*  
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**Raymond, J.** Homer, C (2009). *Maternal Obesity: an Opportunity for Promoting Normal Birth*. Normal Labour and Birth 4<sup>th</sup> Research Conference, University of Central Lancashire, UK

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# **Abstract**

## **Background**

Maternal obesity ( $\text{BMI} \geq 30 \text{ kg/m}^2$ ) is a global public health concern, impacting negatively on the health of women and their babies. Women who are obese are more likely than women of normal weight ( $\text{BMI} < 25 \text{ kg/m}^2$ ) to gain excessive weight during pregnancy, increasing their risk of adverse outcomes. Evidence supports the view that gestational weight gain can be influenced through lifestyle intervention, but few antenatal services with this specific aim exist in Australia. This study describes a realist evaluation of a complex healthcare intervention designed to support obese women to achieve a healthy weight gain during pregnancy.

## **Setting**

The intervention was introduced simultaneously in 2 locations in Sydney, Australia and these provided comparative case studies for the evaluation. Antenatal care was provided in a group setting, and focussed on supporting obese pregnant women to achieve a 'healthy' gestational weight during pregnancy, according to the Institute of Medicine gestational weight gain guidelines.

## **Design**

A theory-driven evaluation approach, employing the realist evaluation framework, was used to develop theory around what worked for whom and in which circumstances, for clinicians, managers and women who participated in the intervention. The intervention strategies were supported by initial theory (self-efficacy), described by Context-Mechanism-Outcome (CMO) configurations. These configurations were examined and refined during analysis, enabling the development of middle range theory.

## **Methods**

A mixed method approach was utilised, employing both quantitative and qualitative data. The analysis involved a two-phase sequential process; comparative analysis followed by thematic analysis.

## **Findings**

The findings highlighted that context has a strong influence on outcomes, and that unseen mechanisms can act as both barriers and enablers. Self-efficacy does play an important part in predicting positive gestational weight gain behaviour, for both clinicians and obese pregnant women. However, the refined theory underpinning the intervention was more complex than originally hypothesised. A theoretical model was developed to describe the interplay between intention, ability and opportunity in predicting individuals' response to the intervention and the possibility of change. The Theory of Planned Behaviour and Social Learning Theory are the middle range theories underpinning this model.

## **Implications for practice**

Group antenatal care designed to support women to achieve a healthy gestational weight gain has not previously been identified as an intervention to address the risks presented by maternal obesity. The theoretical model developed through the process of realist evaluation highlights key features that would enable a similar intervention to 'work' in an alternative setting.

# CHAPTER 1 - INTRODUCTION

Worldwide prevalence of obesity almost doubled between 1980 and 2008 , posing one of the greatest public health challenges of the 21st century (Australian Government Preventative Health Taskforce 2009). The combination of obesity and pregnancy intensifies the issue, both through the adverse impact on the health of the next generation, and the challenge that obesity presents to the provision of maternity services.

Obesity during pregnancy compromises the health of both mother and baby, potentially leading to major complications during childbirth, and increasing the likelihood of chronic illness and childhood obesity. Almost one in five women in Australia is obese at the outset of pregnancy, and over 50% of these women are estimated to gain excessive weight during pregnancy (gestational weight gain), often resulting in weight retention and cumulative weight gain during the childbearing years.

Most women are motivated to have a healthy pregnancy, and gestational weight gain is potentially modifiable through lifestyle interventions. The Institute of Medicine, responsible for publishing and recently reviewing the gestational weight gain guidelines in the United States of America (USA), has recommended that interventions are needed to assist obese women to meet the gestational weight gain goals (Institute of Medicine and National Research Council 2009). However, guidance is lacking on safe and effective interventions. To date, no interventions have reported universal success, and are generally under-reported and inadequately evaluated.

Evaluation measures in healthcare have become increasingly important in recent years, where there is pressure to demonstrate improvements in delivery and outcomes. Evaluation in the 'real' world of healthcare where impact and outcomes are difficult to define and measure is particularly valuable, but presents challenges due to the inherent



complexity. The necessity for this type of evaluation has increased international interest in the field and driven the development of theory-based evaluation methodologies.

This thesis describes a theory-based realist evaluation of a complex healthcare intervention designed to assist obese women to achieve a healthy weight gain during pregnancy, which aims to investigate what worked or did not work, how, for whom and why. Realist approaches assume that nothing works everywhere or for everyone, and that the context in which an intervention is introduced will affect the outcomes. In every intervention, however, there are a number of key features that need to operate in order to effect change. A theoretical model for predicting the likelihood of individuals (both women and health professionals) engaging in behaviour that positively influences gestational weight management has been developed to illustrate the key features relevant to this work.

Chapter 1 presents an overview of the study. The intervention that is the focus of the study is briefly described, followed by an examination of my motivation for undertaking the work. The context into which the intervention was introduced, the aims and objectives of the research and an explanation of the organisation of the thesis are then provided in this introductory chapter.

## **1.1 The intervention**

*‘An intervention is an action on, or an attempt to change a person, group, community or organisation’* (Lazenbatt 2002, p. 32). The intervention that is the focus of this study took the form of peer support through group antenatal care, for women with a pre-pregnancy body mass index (BMI) of equal to or more than ( $\geq$ )30kg/m<sup>2</sup><sup>1</sup>. The aim of the intervention

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<sup>1</sup> The Body Mass Index (BMI) is a measure of body fat based on height and weight that applies to adult men and women. It is calculated by dividing an individual’s weight by height squared. BMI categories range from underweight (BMI<18.5 kg/m<sup>2</sup>), normal weight ( $\geq$ 18.5-24.9 kg/m<sup>2</sup>), overweight ( $\geq$ 25-29.9 kg/m<sup>2</sup>), and obese ( $\geq$ 30 kg/m<sup>2</sup>).

was to provide a collaborative, midwife-led antenatal model of care that supported obese women to achieve a healthy weight gain during pregnancy (as identified by Australian clinical practice guidelines), that was acceptable to both women and healthcare providers, and had the potential to influence lifestyle change in women and subsequently their families. The intervention was introduced on two sites in Sydney, Australia, in 2010 and will be further described in Chapter 4.

## **1.2 My motivation for undertaking this study**

During my midwifery career I have developed a professional, and later, a research interest, in the potential role of the midwife in improving the health of women and their families. In my professional career in the United Kingdom (UK) I was responsible for developing antenatal services within Children's Centres in West London to meet the needs and improve the health of disadvantaged and vulnerable groups of women. The knowledge gained from this work provided me with an insight into the impact of chronic health problems associated with lifestyle factors such as obesity, and the challenges of creating long term behavioural change.

As a midwife working within the New South Wales (NSW) public hospital system (the most populous state in Australia), my interest in obesity and weight management during pregnancy developed from an awareness of the impact of rising rates of obesity in NSW on the maternity services. In clinical practice I have experienced difficulty in meeting the particular needs of obese women in terms of appropriate referral, written information and choices for antenatal care. The literature, to be discussed later in detail, identifies that maternity care providers in Australia lack adequate knowledge in relation to obesity, demonstrate a reluctance to broach the subject of weight with women, and provide antenatal care for women who are obese mainly through 'high risk' antenatal clinics. These factors often result in inaccurate and inconsistent professional advice in relation to appropriate gestational weight gain during pregnancy.

In my current position as a NSW government-employed policy analyst in maternal, child and family health, my work revolves around the development and review of programs, policies and resources in relation to population health. In this context I am involved in the development of programs for families to support the NSW Healthy Eating and Active Living Strategy (NSW Health 2013), including an enhancement to the NSW 'Get Healthy' service, incorporating information and telephone coaching support for healthy eating and activity during pregnancy. This project has necessitated a close examination of various international interventions designed to reduce gestational weight gain. My interest in evaluation methodology has subsequently grown through the need to support programs and services to demonstrate best practice and improved outcomes in order to secure future funding.

Demonstrating short and long term gains in complex health interventions is often challenging, presenting a barrier to ongoing service provision. The opportunity to focus on the evaluation of a complex intervention came in 2010, when I was professionally involved with a multi-disciplinary team at a local level in a number of hospitals in NSW in the design and implementation stages of an intervention which aimed to support obese women to achieve a healthy weight gain. At this time, there was little Australian evidence in relation to specific models of care for obese pregnant women, and no guidance for Australian health professionals regarding gestational weight gain.

My PhD study, which focuses on an evaluation of this intervention, developed from the understanding that the outcomes of a complex intervention alone cannot explain how the intervention works or reveal sufficient information about its future potential. For this reason, my study deliberately employed a theory-driven evaluation methodology, the realist evaluation framework, in an attempt to discover more broadly what worked, for whom and in which circumstances. By applying this evaluation methodology, my study aimed to create a deeper understanding of the factors impacting on an intervention

operating in the context of the 'real world', and to provide guidance on the necessary ingredients, or key factors, for the implementation of similar programs elsewhere in NSW. The next section outlines the context for the study.

## **1.3 The context for the study**

This section provides a brief overview of the organisational, policy and professional context into which the intervention was introduced and the subsequent evaluation took place. The impact of obesity on pregnancy, the professional response to obesity, the concept of gestational weight gain as a key factor in the rising rates of obesity, and the need for well-evaluated practical strategies to support women to manage weight gain effectively during pregnancy are introduced.

### **1.3.1 Obesity and gestational weight gain**

#### **Obesity**

In Australia, the prevalence of obesity has been steadily increasing for the past 30 years, and in 2011, more than 25% of adults were classified as obese (Australian Bureau of Statistics 2012). A proportion of these are pregnant women. Obesity carries a risk to health, contributing to long term chronic health conditions, and impacting negatively on the health of women and their babies during pregnancy.

The availability of data on maternal obesity across Australia is not consistent. NSW for example, is the most populous states in Australia, having a population of 7.6 million (Australian Bureau of Statistics 2015), but not does centrally report maternal Body Mass Index (BMI). Of the six Australian states and two mainland territories, data was available for women who gave birth in 2013 from Victoria, Queensland, Western Australia, South Australia, Tasmania and the Australian Capital Territory (Australian Institute of Health and Welfare 2015). These data included approximately two-thirds of all women in the country. Of these women, almost 1 in 5 (19%) were obese and almost 1 in 4 (24%) were

overweight. Less than 50% (46%) were in the normal weight range. Indications are that the rate of adult obesity overall in Australia is continuing to rise (The National Preventative Health Taskforce 2008). It is estimated, based on past trends, that 75% of women over 20 years old in Australia will be overweight or obese by 2025 (Haby et al. 2012).

Despite this understanding, there are few services in NSW that are specifically designed for women who are obese at the outset of pregnancy. Action during antenatal care is primarily focussed on addressing medical conditions that arise as a direct result of obesity during pregnancy such as hypertension and gestational diabetes, rather than addressing the underlying cause that is obesity. This reactive approach may be due to a number of factors; increasing rates of acuity necessitating immediate management and short term solutions, the normalisation of overweight and obesity in contemporary society, the perception that weight management is a personal responsibility and is beyond the boundaries of healthcare, or because until recently, pregnancy has not been considered an opportune time to address obesity issues.

### **Gestational weight gain**

It is well understood that pre-pregnancy body mass index is independently associated with pregnancy outcome, but the amount of weight gained during pregnancy is also a contributing factor (Nohr et al. 2008; Viswanathan et al. 2008). Data in Australia are not widely available, but international studies suggest that a large proportion of pregnant women gain excessive weight during pregnancy, especially those who are already overweight or obese (Rasmussen & Yaktine 2009).

Excessive weight gain during pregnancy increases the risk of adverse outcomes for both women and babies. These risks include large-for-gestational-age babies (DeVader et al. 2007; Siega-Riz et al. 2009) and caesarean birth (Bodnar et al. 2010; Nohr et al. 2008; Viswanathan et al. 2008). Excessive weight gain is also associated with hypertension

(Crane et al. 2009) and pre-eclampsia (DeVader et al. 2007). These issues will be discussed in more detail in Chapter 2.

Weight gain before, during, and after pregnancy not only affects the current pregnancy but may also contribute to future weight retention in the form of overweight and obesity (Nohr et al. 2008). Weight gain monitoring during pregnancy has not been considered clinically meaningful in Australia for the past 20-25 years and is rarely undertaken as part of routine antenatal care (Australian Health Ministers' Advisory Council 2012). However, research during the last decade focusing on clinical outcomes in relation to weight gain, and on interventions designed to support healthy weight gain has now conferred renewed importance to this issue. These issues are discussed in more detail in Chapter 2.

The local policy context dictates to a large extent how obesity is measured, monitored and managed. The next section describes the clinical policy context in Australia in relation to obesity.

### **1.3.2 The clinical policy context in Australia in relation to obesity**

Addressing obesity in Australia is articulated through a number of national policies and guidelines that demonstrate a recent focus on preventative health, and reflect an urgent concern in relation to the rapidly escalating rates of overweight and obesity. The report *Australia: the Healthiest Country by 2020* (The National Preventative Health Taskforce 2008) sets an action plan for tackling obesity in Australia through a multi-agency response. In terms of health, the report advocates for the development of evidence-based clinical guidelines, communication training for health professionals and the funding of programs in primary care settings for overweight individuals that provide education regarding healthy eating and increased activity. Specific to improving maternal and child health outcomes, the report suggests the development of healthy lifestyle programs during pregnancy that focus on healthy weight gain.

Clinical practice in Australia in relation to overweight and obesity is guided by the *Clinical Practice Guidelines for the Management of Overweight and Obesity in Adults, Adolescents and Children in Australia* (National Health and Medical Research Council 2010), and the *Australian Dietary Guidelines* (National Health and Medical Research Council 2013a). In terms of professional responsibility, the primary healthcare team<sup>2</sup> are strongly encouraged to take a lead in weight management in the recently published *Summary Guide for the Management of Overweight and Obesity in Primary Care* (National Health and Medical Research Council 2013b).

In relation to pregnant women, the Dietary Guidelines, the national *Clinical Practice Guidelines – Antenatal Care Module I* (Australian Health Ministers' Advisory Council 2012), and the Royal Australian and New Zealand College of Obstetricians and Gynaecologists' *Management of Obesity in Pregnancy* (2013) provide guidance in relation to achieving a healthy weight prior to pregnancy and a healthy weight gain in relation to Body Mass Index (BMI) during pregnancy. The impact of the policy context on the organisation of maternity care for women who are obese is discussed in more detail in Chapter 2.

### **1.3.3 The professional context of maternity care in Australia in relation to obesity**

Tackling obesity requires a multi-agency and a multi-disciplinary response. In terms of a woman's lifetime weight gain, significant impacts can be achieved by focussing the efforts of relevant health professionals, such as midwives, at key transition points, such as pregnancy. Pregnancy presents a short window of opportunity for influencing lifestyle change in terms of a woman's lifetime, but is a critical time when women are motivated to make changes that will have an impact on the health of their baby.

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<sup>2</sup> In Australia, the primary healthcare team is usually comprised of a general practitioner (GP), a practice nurse or nurse practitioner, midwife and other healthcare professionals providing a first point of contact and working in the community such as a physiotherapist, occupational therapist and dietitian.

Midwives in Australia are educated to fulfil the International Confederation of Midwives' (ICM) international definition of the midwife (2011). According to this definition, the midwife has responsibilities in terms of preventative health, health counselling and promotion with women, families and within communities. The role of the midwife in promoting health is therefore clearly defined, and midwives have a potentially important role to play in supporting women to make positive lifestyle change by promoting healthy eating, exercise and weight management.

As noted in the previous section, the promotion of health, including weight management, is best positioned in primary care<sup>3</sup>, as it underpins the prevention of chronic disease. The midwife's role in primary healthcare is described by the *National Competency Standards for Midwives*, which identify four key domains that describe the competencies required of midwives in Australia (Australian Nursing and Midwifery Accreditation Council (ANMAC) 2006). One of these four domains is 'Midwifery as Primary Health Care'. This domain encompasses the importance of the midwife's role in public health, promoting 'wellness' for the woman, her family and the community and acknowledging the impact of social, economic and psychological factors on women's lives.

As rates of overweight and obesity in women rise, the need for collaborative models of maternity care that not only manage the medical conditions associated with obesity, but also promote health in its widest sense, become more urgent. A 'model of care' in this context broadly defines the way services are delivered; ensuring that women get the right care, at the right time, by the right team and in the right place. Midwifery may offer a solution to this need for pregnant women through the development of models of care that provide continuity of carer and encourage relationship building, promote weight management by focusing on the basic tenants of a healthy lifestyle, and coordinate

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<sup>3</sup> Primary care in Australia provides a first contact and a principal point of continuing care for patients, and is usually provided by healthcare professionals in the community. Primary care coordinates with specialist care and may involve referral for secondary or tertiary care. Maternity care in Australia may be 'shared' between primary care and hospital maternity care providers.



multidisciplinary referrals throughout pregnancy. The intervention described in my thesis is an example of this form of care and is described in detail in Chapter 4.

### **1.3.4 Complex interventions and the nature of evaluation**

A healthcare intervention, such as that explored in this thesis, is described as complex when it includes multiple components or interdependent parts, typically those that involve changing behaviours in health service organisation and delivery (Blackwood 2006; Oakley et al. 2006). Craig et al. (2008) maintain that few interventions are truly simple, but it is often the combination of components and range of effects that increase the complexity. Highly complex interventions, such as the UK Sure Start intervention to support families with young children in deprived communities, may comprise a set of individually complex interventions in the one program. This combination of different components enables the intervention to become 'more than the sum of its parts' (Hawe, Shiell & Riley 2004, p1561). The nature of complex interventions is discussed further in Chapter 4.

Evaluation measures have become increasingly important to policy makers and financiers of health services in recent years (Lazenbatt 2002), driven by a necessity to demonstrate that such change has occurred, accompanied by an improvement in practice and service delivery (Redfern, Christian & Norman 2003).

In terms of evaluating complex evaluations, a key question is whether they are effective in everyday practice (Haynes 1999). Focusing solely on outcomes however, is unlikely to reveal sufficient information about how they work or their future potential. 'Process evaluation', first described by Patton (1987), is increasingly used to explore the various components that impact on the outcomes of a complex intervention. Exploring process in addition to outcome increases the likelihood of revealing the key components responsible for the success or failure of an intervention.

Over the past two decades, process evaluation has become increasingly analytical in examining how interventions work, for whom and in which circumstances. The ‘theory-based’ approach, sometimes referred to as ‘theory-driven’ approach is a conceptual framework that takes into account the theory underpinning the intervention, or what ultimately makes the intervention work. The realist evaluation framework is a method of applying theory-driven evaluation to identify how and why an intervention works in particular circumstances. This framework was the chosen methodology for my study and is described fully in Chapter 3. The methodology closely guided a review of the evidence, the collection and analysis of the data and the development of the subsequent theory.

## **1.4 The research aim and objectives**

### **1.4.1 Aim**

The aim of the study was to identify what works, for whom and in which circumstances, and to develop a theory to explain why, in relation to a complex healthcare intervention designed to support obese women to achieve a healthy weight gain during pregnancy.

### **1.4.2 Objectives**

The objectives of the study were to investigate the mechanisms that brought about change during the intervention, and to understand the key features that enabled the intervention to work, or not work, in this context.

These aims and objectives were achieved by the following process:

- Use of a theory-driven evaluation framework
- Development of initial theory about how the intervention will work
- Testing of the theory through analysis of qualitative and quantitative data
- Refinement of the theory to provide explanations for the outcomes of the healthcare intervention

The next section provides an overview of the organisation of the thesis.

## 1.5 Organisation of the thesis

The thesis consists of nine chapters.

**Chapter 1** presents the motivation to undertake this work, the context in which the study took place; the research aims and objectives; and an overview of the thesis.

**Chapter 2** reviews the evidence underpinning the study in four sections: obesity and weight gain in pregnancy, published interventions and strategies designed to influence gestational weight gain, and the knowledge and attitudes of key stakeholders (maternity care providers and women) in relation to the intervention.

**Chapter 3** traces the development of theory-driven approaches, introduces realist evaluation and its theoretical underpinning of critical realism, and describes the use of the realist evaluation framework in practice.

**Chapter 4** introduces the intervention that was the focus of the realist evaluation, and describes in detail the context into which the intervention was introduced. The two locations in which the intervention was introduced are examined in terms of their demographic differences and similarities. Using the realist evaluation framework methodology, the evidence supporting group-based antenatal care is explored, and the initial theory of self-efficacy underpinning the design of the intervention is described.

**Chapter 5** describes the realist evaluation design, ethical considerations, data sources, data collection, integration and analysis methods. In accordance with the realist evaluation framework, the hypothesised relationships between context (C), mechanism (M) and outcome (O) are described as conjectured Context-Mechanism-Outcome (CMO) configurations.

**Chapter 6** presents the findings of the study in four sections: the women, the midwives from the antenatal clinics, the group facilitators and additional stakeholders. Within each section, the findings are compared to the conjectured CMOs.

**Chapter 7** is presented in two distinct sections; the first section describes the refined CMO configurations based on the findings of the study, and the second presents a theoretical model developed to describe and explain these findings and support future antenatal weight management interventions.

**Chapter 8** discusses the findings of the study within the context of the model and related published research, based on the elements of the two middle range theories unpinning the model: the Theory of Planned Behaviour and the Social Learning Theory. Recommendations for future practice and research are proposed to add to the body of knowledge about this topic.

**Chapter 9** describes my experience of using the realist evaluation methodology. The strengths and challenges of the methodology are discussed in relation to my own and other researchers' experiences, the wider limitations of my study are described, and recommendations made for the future potential of the methodology.

## **1.6 Chapter summary**

This chapter has provided an introduction to this study through an overview of the motivation to undertake this study, an explanation of the context, the research aims and objectives, and organisation of the thesis. The next chapter, Chapter 2, reviews the evidence that informed the development of the intervention; the relationship between gestational weight gain and obesity and the impact on maternal and fetal health, the response of the maternity service, the experience of pregnant women, and the role of maternity care providers.

## **CHAPTER 2 - EXPLORING THE EVIDENCE**

### **2.1 Introduction**

This chapter explores the evidence in relation to gestational weight gain; the relationship between gestational weight gain and obesity and the impact on maternal and fetal health, the response of the maternity service, the experience of pregnant women, and the role of maternity care providers. The realist evaluation framework methodology closely guided this review of the evidence. The purpose of the evidence review was to identify the context; social, cultural, professional and organisational, into which the intervention was to be introduced. Through this means, existing barriers and enablers were highlighted, facilitating the development of initial theory to unpin the planned strategies of the intervention.

The chapter is presented in four sections: the first section commences with an overview of obesity and gestational weight gain, and examines how these factors are related. Challenges to the understanding of gestational weight gain in Australia are explored. The second section explores and summarises the evidence in relation to published interventions and strategies designed to influence gestational weight gain. Finally, the third and fourth sections examine the knowledge and attitudes of key stakeholders in relation to the intervention; overweight and obese women and maternity care providers.

### **2.2 Method**

An intensive review of the evidence was initially undertaken prior to 2010 to inform the local development of the intervention. The evidence was reviewed and updated in 2013 for this chapter before the analysis of the study data. Apart from a review of two recent large randomised controlled trials published in 2014 and 2015, relevant literature published since 2013 has been incorporated in the Discussion Chapter (Chapter 8), where it is considered in relation to the findings of the study.

The review searched for relevant material using the following key terms: *obesity, overweight, gestational, weight gain*, combined with *pregnancy, childbirth or intervention*, using online databases including CINAHL, ProQuest Central, Embase, Maternity and Infant Care and The Cochrane Library. Criteria for the review included literature published since 1990, in order to capture the evolving research interest in gestational weight gain after the initial publication of the Institute of Medicine Guidelines (IOM 1990). The literature in relation to obesity and gestational weight gain is vast and evidence was only included in this review if it was published in the English language, considered informative to the context of the intervention, and likely to assist with the realist evaluation framework design.

## **2.3 Obesity and gestational weight gain – an overview**

### **2.3.1 Obesity**

The intervention on which this study was based was designed for obese pregnant women, and therefore an initial understanding of obesity and the impact on women during pregnancy and childbirth is relevant, prior to an exploration of the evidence in relation to gestational weight gain. This section briefly defines obesity, reviews international rates of obesity, and outlines the association of obesity with adverse outcomes in pregnancy and childbirth.

#### **Definition and measurement of obesity**

Obesity is defined as an excess accumulation of body fat. It is often a chronic or long term condition that correlates with ill health in both adults and children, resulting from energy intake exceeding energy expenditure for prolonged periods (Cope, Fernandez & Allison 2004).

The prevalence of obesity is most often measured by means of the body mass index (BMI) or Quetelet index (Ockenden 2007). The BMI is calculated by dividing weight by the square of height;  $\text{weight(kg)}/\text{height(m)}^2$ . According to definitions from the World Health Organization (WHO) (2000), BMI categories range from less than  $18.5\text{kg/m}^2$  (underweight) to more than  $40\text{kg/m}^2$  (Obese Class III) (see Table 1 below).

**Table 1: World Health Organization BMI categories**

Category	BMI range - $\text{Kg/m}^2$
Underweight	$<18.50$
Normal	$\geq 18.5 - 24.99$
Overweight	$\geq 25 - 29.99$
Obese Class I	$\geq 30 - 34.99$
Obese Class II	$\geq 35 - 39.99$
Obese Class III	$\geq 40$

(WHO 2000)

Despite its general popularity, BMI was never designed for pregnancy, and therefore can only offer limited individual accuracy once a woman becomes pregnant (Baker et al. 2007). Nevertheless, routinely measuring women's height and weight and calculating BMI at the outset of pregnancy is recommended in the UK (CMACE & RCOG 2010; National Institute for Health and Clinical Excellence 2008), the USA (Institute of Medicine and National Research Council 2009), Canada (AOM 2010; SOGC 2010) and Australia (Australian Health Ministers' Advisory Council 2012), in order to plan appropriate care. This is particularly important where transfer for birth across large distances may be necessary, such as for women living in rural and remote areas of Australia (Dodd et al. 2011).

## **Current and projected rates of obesity**

Rates of overweight and obesity have risen sharply in the past 30 years in both high income and developing nations. The World Health Organization (WHO 2008) estimate that more than 1 billion adults are now overweight, with at least 300 million of these clinically obese. Current obesity levels range from below 5% in China and Japan to over 75% in Urban Samoa. In Australia, 63% of adults were classified as overweight or obese in 2013, and 1: 4 of the population were obese (Australian Institute of Health and Welfare 2010). A review of 52 studies from 25 countries, carried out between 1999 and 2010, suggested that since 1999 there has been some 'levelling off' (Rokholm, Baker & Sørensen 2010, p. 841) of obesity rates in children and adolescents in the USA, Australia and Europe, and some stability in adult rates in the USA. The authors caution against complacency however, maintaining that increases in rates of adult obesity during this time period were still evident in Europe and some Asian countries, particularly amongst lower socio-economic groups, and that previous stable phases have been followed by further increases.

Some groups appear to be experiencing a higher escalation of obesity than others. Young women in Australia are gaining weight at a faster rate than older women, and obesity is more commonly occurring at a relatively young age (Australian Government Preventative Health Taskforce 2009; Haby et al. 2012). In relation to women of child bearing age in New South Wales (NSW), Australia, in 2013 only 4.6% of women aged 16-24 years were obese, but this rose sharply; to 13.7% in the 25-34 year age group and 17.7% in the 35-44 years age group (Centre for Epidemiology and Evidence 2013). These findings demonstrate very rapidly rising rates of obesity amongst women of child bearing age in NSW; as they grow older they are growing heavier. This finding is replicated in many countries worldwide. In the USA, where information regarding BMI in relation to pregnancy is available from the Pregnancy Risk Assessment Monitoring System, data from nine US states also demonstrated a 70% increase over the past decade in the proportion of women who are obese at the outset of pregnancy (Kim et al. 2007).



The report *Tackling Obesities: Future Choices Project*, in the UK (Foresight 2007), predicted that if no action is taken, 50% of women will be obese in the UK by 2050. Despite some positive evidence of a stabilisation in the rates of obesity globally, it has been estimated that rising rates in Australia have a similar potential (Haby et al. 2012), increasing the likelihood of short and long term morbidity for obese women and their babies, and increasing pressure on health services.

### **Determinants of obesity**

An understanding of the determinants of obesity is helpful in identifying some of the challenges that may be experienced by women who are obese in relation to weight gain during pregnancy. Simply expressed, energy balance is ultimately determined by calorie intake and physical activity (Chagnon et al. 2003). Increasingly sedentary lifestyles, easy access to energy-dense, cheaper foods that need little time to prepare, and a poor understanding of the relationship between energy intake and expenditure have all been blamed for the current rates of overweight and obesity.

In high-income countries, such as Australia, lower socio-economic status is associated with overweight, both in terms of individuals and whole families (ABS 2007; Howard et al. 2008; Leather 2003). In one Australian study, Sutherland et al. (2013) examined the social factors that were associated with pre-pregnancy overweight and obesity by means of a survey of 4,366 women in two states, Victoria and South Australia, six months after the birth of their babies. The results demonstrated a socio-economic gradient for household income and education; decreasing levels of household income and education were associated with increasing odds of obesity. Increased parity and being Australian-born were also associated with a higher likelihood of obesity in this study.

Buckroyd and Rother (2007) found that psychological issues are a critical factor in chronic obesity. These authors base their findings on their experience in a group-based program in

the UK, designed to change the relationship that obese women maintain with food. These authors claim that women in the group-based program described eating as a reliable focus for comfort, and a way of managing their emotional lives. The authors describe the coincidence of a 'toxic environment' (Buckroyd & Rother 2007 pxviii) of energy-rich food with a breakdown of family and community support networks.

Pregnancy appears to be an independent risk factor for obesity. Evidence suggests that there are two important factors that contribute to the long term development of overweight and obesity in women; excess weight gain during pregnancy and failure to lose weight after pregnancy (Fraser et al. 2011; Gould Rothberg et al. 2010; Nehring et al. 2011). In the USA, it has been demonstrated that the increased prevalence of obesity has been accompanied by an increase in the average weight gained during pregnancy (Rasmussen & Yaktine 2009). Weight gain during pregnancy is discussed in greater detail in the next section.

The influence of the intrauterine environment is increasingly thought to play a part in making individuals susceptible to obesity in later life. It is understood that the child of a mother who is obese is more likely to become obese, compared to a child whose mother is of normal weight (Whitaker 2004). A review of the evidence has suggested that maternal obesity, specifically the maternal diet, may be the most common health risk for the developing fetus in terms of 'over-nutrition' and metabolic programming for obesity before birth (Heerwagen et al. 2010). Animal studies have demonstrated that exposure to a high fat maternal diet in utero influences behaviour in terms of appetite (Levin 2008) and a preference for high-fat 'junk food' in the offspring (Bayol, Farrington & Stickland 2007). Although the mechanism responsible for this association is not yet well understood, early research suggests that the quality of the food eaten in pregnancy is an important determinant of subsequent overweight and obesity in children.

## **Pregnancy outcomes related to obesity**

Reviews of maternal obesity and pregnancy outcomes over the last decade (Dodd et al. 2011; Hall & Neubert 2005; Sarwer et al. 2006) have concluded that obesity is independently associated with an increased risk of pregnancy associated complications, and risk rises in line with pre-pregnancy BMI. Antenatally, these complications include hypertension and preeclampsia, gestational diabetes, and venous thromboembolism (Abenhaim et al. 2007; Cedergren 2004; James et al. 2006; La Coursiere et al. 2005). In terms of labour, women who are obese are more likely to experience induction of labour, caesarean birth and stillbirth (Callaway 2006; Doherty et al. 2006; Homer et al. 2011). Postnatally, complications include postpartum infection, thromboembolism, postpartum haemorrhage (Bhattacharya et al. 2007) and breastfeeding difficulties (Amir & Donath 2007).

Babies born to obese mothers are more likely to be large for gestational age (LGA), or greater than the 90<sup>th</sup> centile for birth weight, predisposing them to complications at birth. A large systematic review and meta-analysis to test an association between pre-pregnancy BMI and infant birth weight was conducted by Yu et al (2013). In total, 45 studies of medium to high quality were extracted from three databases. The results demonstrated that compared to normal weight, pre-pregnancy maternal overweight and obesity increases the risk of large for gestational age, high birth weight, and macrosomia. Babies of obese mothers are also more likely to experience morbidities such as birth defects, lower Apgar scores and admission to a special care nursery unit, and to be obese in childhood when compared to those born to normal weight women (Hedderson et al. 2006; Minsart et al. 2013; Stotland et al. 2006).

In the UK, rising rates of maternal mortality have been linked to obesity. The eighth report of the Confidential Enquiries into Maternal Deaths in the UK and Child Health (Centre for Maternal and Child Enquiries (CEMACE) 2011) reported that 27% of all women who died between 2006-2008 were obese. Perinatal complications rise in line with BMI, and

therefore women who are overweight are also at risk, albeit at a lower level. Of particular note in the report is that 78% of the women who died from thromboembolism, and 61% who died from cardiac disease were either overweight or obese.

Obesity is now considered one of the greatest challenges to maternity services due to the impact that preventing and managing potential complications has on planning, organisation, delivery of care, and the practice of maternity care providers (Heslehurst et al. 2012).

### **Obesity - summary**

Rates of obesity in relation to women of childbearing age continue to rise in Australia and worldwide. This rise has been linked to sedentary lifestyles, easier access to high-fat convenience foods, lower socio-economic status, psychological factors, excess weight gain in pregnancy, and intra-uterine metabolic programming of the fetus related to maternal diet in pregnancy. Risks for perinatal morbidity and mortality rise in line with pre-pregnancy BMI and can present significant complications for both mother and baby. The next section explores the relationship between obesity and weight gain in pregnancy; gestational weight gain.

### **2.3.2 Gestational weight gain and impact on outcomes**

This section defines gestational weight gain, explores the influence on pregnancy outcomes and considers optimal limits in relation to maternal and neonatal health. The topical nature of gestational weight gain is reflected by the large number of recently published research studies and clinical practice guidelines.

Gestational weight gain, for the purpose of this study, refers to total weight gain, from just before conception to just before birth of the baby (Institute of Medicine and National Research Council 2009). Gaining inadequate or excessive weight during pregnancy is associated with a number of poor maternal and neonatal health consequences. Women

who are obese are more likely to gain weight excessively rather than inadequately during pregnancy and therefore in line with the aims of my study, this evidence review will only consider excessive gestational weight gain.

### **Optimal gestational weight gain**

Weight gain in pregnancy has long been associated with satisfactory pregnancy outcomes, and health and research bodies have attempted for many years to define the most appropriate amount of weight gain in order to achieve optimum maternal and neonatal benefit. During the early part of the twentieth century the belief that excessive weight gain during pregnancy caused oedema and hypertension necessitated advice for a severely restricted weight gain (Ellison and Holliday, 1997). It was not until the 1960s that low birth weight was definitively associated with poor maternal weight gain (Eastman and Jackson, 1968) and the practice of severely restricting weight gain ceased. However, measuring weight gain throughout pregnancy continued for several decades longer in the UK and Australia, until its use as a sensitive or specific screening test for any clinical condition was largely discredited, and the practice was largely discontinued (Dawes and Grudzinskas, 1991; Ellison, Harris and Holliday, 1997; Jensen and Larsen, 1991).

Until recently, guidance in New South Wales (NSW) for women and maternity care providers has suggested that approximately 12kg is an 'average' weight gain during pregnancy (NSW Health 2006). There is however, no universal agreement about the amount of weight that women should gain in pregnancy, or that official gestational weight gain guidelines should exist (National Institute for Health and Clinical Excellence 2010). A review by Alavi et al. (2013) compared international gestational weight gain and energy intake guidelines across various countries, in addition to the rationale or evidence on which they were based. The review revealed that gestational weight gain guidelines exist in 13 countries, but there is a marked variation in international approaches. Of countries where guidelines exist, 31% (including Canada, Finland and parts of Australia) are using

the Institute of Medicine (IOM) guidelines, developed in the USA. These guidelines are based on pre-conception BMI, and were originally published in 1990 (IOM 1990).

The initial driver behind the original (1990) IOM guidelines was to effectively reduce the incidence of low birth weight, in part attributed to poor weight gain. However, the original publication coincided with rapidly rising rates of obesity in developed countries, alongside a trend for greater numbers of macrosomic babies (Kramer et al. 2002). Soon after publication, the guidelines were criticised for providing inadequate weight gain advice to obese women (Schieve, Cogswell & Scanlon 1998; Stotland et al. 2006) and for contributing to the obesity epidemic (Feig & Naylor 1998; Kiel et al. 2007). The IOM guidelines have subsequently been re-examined and were re-published in 2009, recommending lower levels of weight gain for obese women (Rasmussen & Yaktine 2009) (Table 2). The updated guidelines have been endorsed by the American College of Obstetricians and Gynecologists (ACOG) (ACOG 2013a, 2013b) and are considered the ‘defacto’ standard of care in the USA (Viswanathan et al. 2008).

**Table 2: Institute of Medicine guidelines for gestational weight gain**

Pre-pregnancy BMI	Recommended total weight gain (kg)*	Recommended mean weight gain in 2 <sup>nd</sup> and 3 <sup>rd</sup> trimester (kg)
Low BMI <18.5	12.5 – 18.0	0.51 kg/week
Normal BMI 18.5 – 24.9	11.5 – 16	0.41 kg/week
High BMI >25.0 - 29.9	7 - 11.5	0.28 kg/week
Obese women ≥30	5 – 9	0.22 Kg/week

Adapted from Rasmussen and Yaktine (2009)

\* adjusted from measurement in pounds to the nearest 0.5kg

The IOM guidelines have been informed by observational data and demonstrate the range of weight gain associated with the least risk of adverse perinatal outcomes (Rasmussen & Yaktine 2009). The guidelines recommend a relatively narrow 5-9kg range for all obese women, stating there is insufficient evidence to specify separate weight gain recommendations for women in Obesity Classes I, II, or III. Other researchers challenge

this view, maintaining that lower levels of weight gain improve perinatal outcomes in heavier women, for example those categorised as Obesity Class III (Bodnar et al. 2010; Crane et al. 2009; Kiel et al. 2007). In one large population-based study of over 120,000 women in the USA, Kiel et al. (2007) calculated a range of weight gains associated with minimal risk in terms of preeclampsia, caesarean birth, large- and small-for-gestational-age for women in each Obesity Class: 4.5-11kg for Class I, 0-4kg for Class II and a loss of 0-4kg for women in Class III.

Despite this controversy, the IOM guidelines remain the most commonly adopted gestational weight gain recommendations in the absence of country-specific guidelines (Willcox et al. 2012), and the most commonly used as target weight gains in research study designs for weight gain interventions. The IOM guidelines (Rasmussen & Yaktine 2009) are predominantly based on data from the USA, and are therefore not intended for use in other countries or ethnic backgrounds where women are substantially shorter or thinner.

In Australia, the IOM guidelines have been endorsed for use by maternity care providers in Queensland (Queensland Government 2010), and more recently in a College Statement by the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (2013). The guidelines have also been cited, but due to the lack of conclusive evidence were not endorsed, in national antenatal guidelines in Australia (Australian Health Ministers' Advisory Council 2012), in the Australian Dietary Guidelines (National Health and Medical Research Council 2013a) and consumer resources in NSW (NSW Health 2012).

There is therefore a growing consensus within Australia in relation to appropriate weight gain in pregnancy, but there is little guidance on how to help women to achieve these goals. Current Australian clinical practice guidelines for the management of overweight and obesity in adults (National Health and Medical Research Council 2010) for example, makes little reference to pregnancy, identifying it as a life-stage that increases the risk of

weight gain, and as a contraindication for clinical obesity treatment. This situation creates uncertainty for both maternity care providers and for pregnant women, which is further explored in sections 2.4 and 2.5 of this chapter.

### **Outcomes related to excessive gestational weight gain**

‘Excessive’ gestational weight gain throughout this thesis refers to weight gained in excess of that recommended by the IOM guidelines, based on pre-pregnancy BMI (Table 2).

Evidence on the health effects of excessive gestational weight gain has been largely obtained from observational cohorts and longitudinal studies. The maternal and neonatal outcomes assessed in these studies mainly focuses on infant birthweight and fetal growth, delivery complications and post-partum weight retention. For all maternal outcomes, less gestational weight gain is advantageous (Herring & Oken 2010). In contrast, greater gestational weight gain may be associated with some improved infant health outcomes such as a reduced risk of preterm birth, but increased risk for others such as large-for-gestational-age, low Apgar scores (Nohr et al. 2008) and childhood obesity (Ludwig & Currie 2010), independent of pre-pregnancy BMI.

According to a comprehensive systematic review of maternal weight gain, conducted for the Agency for Health Quality Research (AHQR) in the USA (Viswanathan et al. 2008), the clearest risk for women of all BMIs who gain excessive gestational weight gain is postpartum weight retention and non-elective caesarean section. Weight gained in pregnancy and retained between pregnancies can be cumulative, so that women are at risk of becoming progressively heavier during their childbearing years (Nohr et al. 2008; Viswanathan et al. 2008). In relation to Australian women, data from the Mater Misericordiae Mothers' Hospital-University of Queensland Study of Pregnancy (MUSP) were used to examine a sample of 2026 mother-infant pairs, where data on pre-pregnancy BMI, weight gain during pregnancy and measured BMI at 21 year follow up were available (Mamun et al. 2010). The study found that those women who gained



excessive weight in pregnancy were at a greater risk of being overweight or obese 21 years later, particularly if they had a high pre-pregnancy BMI.

The risk for caesarean section rises with excessive maternal weight gain, independent of infant birthweight, particularly amongst women already overweight or obese (Stotland, Hopkins & Caughey 2004). A population based study of over 6,660 Australian women in Queensland found that women with excessive weight gain had greater risk of experiencing caesarean birth, estimated at 9% greater risk for each 0.1kg/week increase above the IOM weight gain recommendations (Mamun et al. 2011).

The relationship between pre-pregnancy BMI and both gestational diabetes mellitus (GDM) (Rasmussen & Yaktine 2009) and hypertensive disorders (Sibai et al. 1995) is well understood. However, the specific relationship between these disorders and gestational weight gain is not well established. It is suggested that the rate of weight gain in relation to the trimester of pregnancy, rather than the total weight gain, may have more significance in terms of maternal and infant outcomes than was previously thought (Carreno et al. 2012; Viswanathan et al. 2008). Recent evidence suggests that gaining excessive weight in the first trimester appears to make the development of some perinatal complications more likely (Gaillard et al. 2013). In terms of GDM for example, Carreno et al. (2012) examined gestational weight gain data on 7985 women in the USA and found that among women with a healthy pre-pregnancy BMI, GDM was associated with early excessive weight gain in the first 15-18 weeks of pregnancy.

### **Prevalence of excessive gestational weight gain**

Despite the potential for a positive association with improved pregnancy outcomes, evidence suggests that most pregnant women do not achieve weight gain in line with the IOM recommendations (Kiel et al. 2007; Olafsdottir et al. 2006; Stotland et al. 2006). The prevalence of excess gestational weight gain in developed countries has been reported in

population-based studies to be approximately 50%, varying between 40% and 70% dependent on the woman's pre-pregnancy BMI (Chu et al. 2009; Park et al. 2011).

Various studies have demonstrated that women who are overweight or obese before pregnancy are 2-6 times more likely to gain excessive weight during pregnancy than women of normal weight (Brawarsky et al. 2005; Chasan-Taber et al. 2008; Wells et al. 2006). However, it should be acknowledged that although 'excessive' according to the IOM guidelines, the mean total weight gain during pregnancy tends to be actually less for those women who enter pregnancy overweight or obese. For example, in an Australian study by de Jersey et al (2012) involving over 660 women in all BMI categories, weight gains were  $11.6 \pm 8.1$  kg for overweight women versus  $14.2 \pm 5.3$  kg for healthy weight women.

Gestational weight gain data is only available from countries where routine weighing of women is a component of antenatal care. There are however, a small number of single studies conducted at various locations within Australia that offer a limited understanding of the prevalence of excessive gestational weight gain in this country. Mamun et al. (2011) undertook a population based study using data from the records of 6632 women who gave birth in Brisbane, Australia between 1981 and 1983, when weight was routinely recorded at each antenatal visit. The study findings demonstrated that the women who gained excessive weight during pregnancy were more likely to have a lower educational attainment, be of Aboriginal or Islander origin, never smoked and abstained from alcohol prior to pregnancy. It should be acknowledged however, that lifestyles have changed considerably in the past 30 years, and these findings may not have relevancy to the lifestyle behaviours of pregnant women today.

A more recent study, involving 664 pregnant women in Queensland, claims to be the first to prospectively measure and describe gestational weight gain in an Australian obstetric population (de Jersey et al. 2012). Between 2010 and 2011, participating women were

weighed at 16 weeks and at 36 weeks of pregnancy. The study found that 56% of overweight women gained in excess of the guidelines, compared to 30% of those who started with a healthy weight. Similar findings have been noted in a multicentre international study, involving 1950 women of all BMI categories from Ireland (n=1211), New Zealand (n=264) and Australia (n=475) (Chung et al. 2013). The women were weighed at 14-16 weeks and again at the end of pregnancy, similar to the study by de Jersey et al. The results demonstrated that 74% overall had excessive gestational weight gain. In common with the de Jersey et al. study and consistent with other published studies (Viswanathan et al. 2008) is the finding that overweight and obese women were the most likely to gain excessive weight according to the IOM guidelines.

Overall, patterns of gestational weight gain across Australia are poorly understood, effectively preventing an examination of gestational weight gain trends over time. However, it can be surmised that excessive gestational weight gain is contributing to rapidly rising rates of overweight and obesity in Australia, in much the same way as in other high-income countries such as the UK and the USA, and in middle income countries such as Samoa and Tonga.

### **Gestational weight gain - summary**

The literature reviewed in this section has demonstrated that excessive weight gain during pregnancy has a negative impact on maternal and neonatal health outcomes. Early weight gain during pregnancy appears to be associated with increased risk of particular complications, such as GDM, supporting early intervention to reduce the likelihood of excessive weight gain. Women who are already overweight or obese prior to pregnancy are more likely to gain excessive weight than women who are underweight or of normal weight, which increases their risk of cumulative weight gain and impacts on their overall health. Recording weight gain during pregnancy is no longer routine practice during pregnancy and therefore data in relation to gestational weight gain in Australia is sparse.

However, a resurgence of concern in relation to gestational weight gain has resulted in the recent publication of clinical guidance from a variety of sources.

The next section explores the potential for influencing gestational weight gain through lifestyle interventions during pregnancy.

## **2.4 Interventions designed to influence gestational weight gain**

While it is unknown which strategies assist women who are obese to manage their weight gain most effectively during pregnancy, it is generally accepted that intervening can have some benefit (de Jersey et al. 2012). This section reviews the evidence for various strategies.

### **2.4.1 Interventions – an overview**

A total of 14 systematic reviews were published by Australian and international authors between 2010 and 2012 that examined lifestyle intervention studies aimed at preventing excessive gestational weight gain. Each review included between four and 34 individual studies, dependent on the review criteria. Lifestyle interventions include strategies such as dietary, physical activity and weight monitoring (Streuling et al. 2011), attitudinal changes through education (Gardner et al. 2011), and psychological and motivational strategies (Skouteris et al. 2010). This number of reviews highlights the intensive research interest in this topic at the time. It is interesting to note that an earlier systematic review of randomised controlled trials of weight-management interventions for pregnant or postpartum women to assess whether effective weight-management interventions existed for these populations (Kuhlmann et al. 2008), found only one study for pregnant women at this time that fitted this criteria.

There are few studies of interventions that focus solely on overweight and obese women, and only a small number of systematic reviews that focus on these studies alone (Dodd et

al. 2010; Oteng-Ntim et al. 2012; Quinlivan, Julania & Lam 2011; Sui, Grivell & Dodd 2012). The primary outcome in studies that aim to prevent excessive weight gain is total weight gain during pregnancy. Few studies have reported changes in maternal or neonatal health outcomes. Those studies that do include these outcomes, demonstrate that lifestyle interventions can reduce post-partum weight retention and the incidence of caesarean section and pre-eclampsia in line with a reduction in gestational weight gain (Tanentsapf, Heitmann & Adegboye 2011; Thangaratinam et al. 2012).

Reviews of weight management interventions in pregnancy have reported mixed results in terms of total weight gain during pregnancy; some interventions are only successful in selected population groups, such as women of normal weight (Polley, Wing & Sims 2002) or those in low income groups (Olson, Strawderman & Roberta 2004), and most interventions demonstrate only small reductions in gestational weight gain.

Thangaratinam et al. (2012) reviewed randomised controlled trials only, involving a total of 7278 women. The review categorised the intervention studies which provided an additional level of analysis: those that utilised diet, physical activity or a mixed approach. The conclusions of the review were that those interventions based on dietary change were most effective in reducing weight gain, and were also associated with improved obstetric outcomes.

All published reviews of gestational weight management interventions note that the lack of well-designed studies of strong methodological quality has prevented the development of evidence-based recommendations for practice. Studies have demonstrated that changes in dietary and physical activity can result in lower gestational weight gain, but the mechanism by which this occurs is not clear (Ronnberg & Nilsson 2010). Differences in intervention design, content, delivery and evaluation, combined with under-reporting of the intervention and failure to evaluate behaviour change, mean that the 'active intervention ingredients' are very hard to define (Gardner et al. 2011).

#### **2.4.2 Strategies that have been shown to be helpful**

Despite the methodological differences, a number of published reviews of interventions have attempted to identify the key factors that influence weight management in pregnancy. Simple strategies such as giving women advice regarding about a target gestational weight gain (Cogswell et al. 1999) and encouraging women to self-weigh during pregnancy (Jeffries et al. 2009) appear to be effective in some groups, but not all. As in the non-pregnant population, intensive initiatives appear to produce the most effective results, particularly for obese women (Phelan, Jankovitz, et al. 2011). Intensive strategies include structured meal plans (Mottola et al. 2010), monitoring intake with food diaries (Quinlivan, Lam & Fisher 2011), weekly contact (Claesson, Sydsjo, et al. 2008) and counselling combined with weight monitoring (Streuling et al. 2011).

In relation to physical activity, intensive programs that are supervised or monitored (using pedometers or diaries), rather than simply counselling for increased activity have been shown to contribute to a small reduction in gestational weight gain (Muktabhant et al. 2012). In Queensland, Australia, de Jersey et al (2011) delivered an antenatal care program to obese pregnant women which involved one group education session accompanied by written information on recommendations for dietary and physical activity. By the end of the pregnancy, only 16% of the women who received the intervention recalled being spoken to about gestational weight gain, suggesting that a one-off session is insufficient even to raise awareness.

Two Australian reviews by Skouteris et al. (2010) and Dodd et al. (2010) reported that the evidence for particular strategies was unclear. In a review of 10 individual studies of international origin, conducted between 2000 and 2010, Skouteris et al. noted that many of the interventions reviewed used the provision of education or advice as a strategy to change behaviour, but did not focus on psychological factors which might have influenced the way the information was received. It is well known that giving women information is not enough to change behaviour (World Health Organization 2003); in a large cohort of

non-pregnant women, only a small proportion of women planning a pregnancy followed recommendations for a healthier lifestyle when this was given as advice alone (Inskip et al. 2009).

Skouteris et al. (2010) maintained that adoption of new behaviours is more likely when behavioural and psychological interventions are combined with patient education and monitoring, enabling women to set personal goals. One lifestyle intervention undertaken in Belgium with over 200 obese women was shown to achieve lower levels of anxiety in addition to significantly lower levels of gestational weight gain. The women in this study were randomised to one of three groups; a normal care group, a 'brochure' group who received written information on a healthy lifestyle, and a group assigned to four additional face to face lifestyle sessions that used the principles of motivational interviewing. The women in the face to face groups showed lower levels of measured anxiety than in the normal care or brochure groups, which the authors suggest may assist in the long term with weight reduction (Bogaerts, Devlieger, et al. 2013).

In the non-pregnant population, weight management in group settings is provided commercially with successful outcomes. Heshka et al. (2003) demonstrated that a multi-component commercial program (Weight Watchers) was more effective in terms of weight loss and weight control over a two year period, than individual or self-help programs. Recommendations for action in the updated IOM guidelines in the USA (Rasmussen & Yaktine 2009), suggested trialling weight management in groups during pregnancy.

To date, there are few published studies of group interventions during pregnancy that target either dietary or physical activity, and those that exist show mixed results. In one study designed to prevent excessive gestational weight gain amongst obese women, aqua-aerobic group sessions were shown to be enjoyed by women as an opportunity for social interaction (Claesson, Josefsson, et al. 2008). In other studies, recruitment to weight

management group sessions during pregnancy has been reported as challenging by health professionals (West 2010) and declined by approximately 50% pregnant women when offered in addition to regular antenatal visits (Olander & Atkinson 2013; Poston et al. 2013). The literature suggests that reasons for non-attendance to the small number of Australian weight management groups during pregnancy have included access (location, parking, poor transport links), childcare, work commitments, tiredness, and disinterest in weight management during pregnancy (Davis et al. 2012; Lee et al. 2012).

### **2.4.3 Recent intervention studies**

Two recent large randomised controlled trials are examined in this section. Firstly, the South Australian LIMIT trial (Dodd et al. 2014), and secondly the UPBEAT study (Poston et al. 2015) conducted in the UK. These trials were underway at the same time as my study, and have been highlighted in this review because they demonstrate a number of challenges associated with introducing interventions designed to change lifestyle at a population level.

The authors of both trials acknowledge that interventions to date have shown some success in limiting weight gain in pregnancy, but the maternal and neonatal outcomes associated with limiting maternal weight gain has been under-reported. A primary outcome in both trials included the incidence of babies born large for gestational age (over the 90<sup>th</sup> centile for sex and gestation). In addition, the incidence of gestational diabetes was a primary outcome in the UPBEAT and a secondary outcome in the LIMIT trial.

The LIMIT trial was conducted between 2008 and 2011 in three South Australian hospitals. Women with a BMI  $\geq 25\text{kg/m}^2$  (overweight or obese) were allocated to either intervention or standard care. The intervention was a series of six antenatal contacts by a research dietitian or research assistants, three face to face and three by telephone, consisting of healthy eating and physical activity advice, combined with behavioural strategies. Of those



women who were invited to participate, 60% declined, and only 77% of those enrolled attended a second dietary session. A total of 2152 women and 2142 babies were subsequently included in the intention to treat analysis.

The results of the LIMIT trial demonstrated that there were no significant difference in the risk of infants born large for gestational age between the two groups, but infants born to women in the intervention group were less likely to weigh above 4000gm. There were no differences in the incidence of gestational diabetes or maternal gestational weight gain between the two groups (42% gaining above the IOM recommendations).

The UPBEAT trial was conducted between 2009 and 2014 in eight inner city hospitals in the UK. Women with a BMI above 30kg/m<sup>2</sup> (obese) were recruited to either a behavioural intervention or standard care. The intervention was based on social cognitive theory, and consisted of eight individual or group sessions led by a health coach; four face to face and three by phone or email. The sessions included motivational strategies such as goal setting. Of the 8259 women who were eligible to take part, only 19% agreed to participate, and 1555 were enrolled. Face to face sessions were less popular; 46% of women attended less than four, and 30% attended only one.

The primary outcomes of the UPBEAT trial were maternal gestational diabetes and large for gestational age babies. Women in the intervention group gained less weight (mean 0.55kg) than women in the standard care group, but there was no difference in the incidence of gestational diabetes or in the incidence of large for gestational age babies. Both trials will follow up the participants and their babies into early childhood.

These studies, conducted with relatively large numbers of overweight and obese women, were not able to reduce the incidence of a number of adverse pregnancy outcomes through a lifestyle intervention. However, it should be noted that despite the intensive nature of these interventions, the uptake in both studies was not high, and there was

minimal impact on gestational weight gain, mirroring the difficulties experienced in smaller studies. The authors of both trials recommend (amongst other strategies) effective public health measures that prevent the development of obesity in women of reproductive age.

#### **2.4.4 Interventions in Australia - acceptability and feasibility**

Data related to population rates of overweight and obesity are readily available in Australia (Australian Institute of Health and Welfare 2010) as in other high-income countries. As noted in Chapter 1, data in relation to the BMI of women booking for maternity care is however, not accessible from all States and Territories Australia-wide, including NSW. Trends in relation to rates of obesity in the antenatal population in Australia are therefore difficult to analyse and there is insufficient prevalence data in NSW on which to base service development. Additional factors influence the accuracy of data in Australia; the timing of the woman's initial weight measurement in pregnancy for example, varies between Australian States and Territories; in Victoria, the pre-pregnancy weight is recorded, whereas in Western Australia, it is weight at the time of booking, and in South Australia there are no definitions to guide practice.

International evidence suggests that antenatal interventions for weight management are opportune (Stotland, Gilbert & Bogetz 2010), but few hospitals in Australia appear to provide services specifically for overweight and obese women that address their weight (Wilkinson & Tolcher 2010), although there is some evidence that Australian women feel it is important for hospitals to offer these (Lee et al. 2012). A survey undertaken by the Women's Hospitals Australasia (WHA) (WHA 2008) revealed that over 20% of specialist or general hospitals providing antenatal care did not provide any type of intervention service for overweight or obese women (including access to a dietician), and only just over 50% provided information for women on weight management during pregnancy.

Any successful healthcare intervention must not only be acceptable to both recipients and healthcare professionals, but to be sustainable in the long term it must be feasible in terms of existing resources. Most published interventions to prevent excess gestational weight gain appear to involve significant amounts of time and resources from nutritional or exercise specialists, and it is unclear whether training maternity care providers would have the same effect (Campbell et al. 2011). Available evidence demonstrates that programs or interventions that commence prior to 12 weeks gestation are more likely to result in a lower gestational weight gain (Gardner et al. 2011), but the resource and organisational implications for providing intensive weight management programs before women are officially booked for antenatal care is problematic in the Australian public health system.

#### **2.4.5 Summary - interventions to limit weight gain in pregnancy**

The evidence supports the view that gestational weight gain can be influenced through lifestyle intervention during pregnancy with the potential for positive health outcomes. Although studies have demonstrated that changes in dietary and physical activity can result in lower gestational weight gain, the mechanism by which this occurs, and the extent of the impact on maternal and neonatal outcomes is not clear. There are a few antenatal services, or models of care in Australia that address weight gain.

Lessons can be learnt from what works in the non-pregnant population in relation to weight management; effective strategies vary from the simple to the very intensive, but to be most successful, these need to be combined with psychological and behavioural strategies to encourage engagement and motivation. A successful intervention needs to be acceptable to women and to maternity care providers, and to be resource efficient in an environment where over 50% of women booking for antenatal care are overweight, and resources in the public healthcare system are limited.

## **2.5 The views and beliefs of obese women in relation to antenatal care and gestational weight gain**

Gaining a broad understanding of the context in relation to the perspectives of the target group is critical to any intervention. This section presents the views of obese pregnant women in relation to antenatal care, their attitudes and knowledge in relation to gestational weight gain, and briefly explores the concept of motivation for change during pregnancy.

### **2.5.1 Acceptability of antenatal care**

Relatively few studies have been published on of obese women's experiences of maternity care. Smith and Lavender (2011) explored the maternity experience for women with a BMI  $\geq 30\text{kg/m}^2$  in a meta-synthesis of only six qualitative studies published in the preceding 13 years, five of which had been undertaken in the UK and one in Sweden. Obese women related many negative experiences in relation to their maternity care; de-personalisation of care as a result of medicalisation was a central theme for example, in the findings of these authors. The increased screening and monitoring offered as part of 'high BMI' protocols made women feel more anxious, as if their identity had become secondary to that of the growing baby (Furber & McGowan 2010).

In the studies considered in this meta-synthesis (Smith & Lavender 2011) women reported feeling humiliated, embarrassed or guilty in relation to their size. The negative attitude of maternity care providers was unhelpful; some women reported their carers as being sarcastic and uncaring (Heslehurst et al. 2013; Keenan & Stapleton 2010), or of withholding information from them (Nyman, Prebensen & Flensner 2010). Lack of trust and low self-esteem are likely to affect women's ability to make effective behavioural or lifestyle changes, and this has particular relevance to the context of my study in terms of potential barriers to engagement.

Women's views in regard to support are key to developing a successful intervention. Obese women are likely to experience more complicated pregnancies and consequently meet a greater number of carers, which can be challenging in term of providing consistent support (Hildingsson 2012). Furness et al (2011) undertook a qualitative study in Doncaster, UK, to explore the experiences and perceptions of six obese women and seven midwives in relation to support for weight management in pregnancy and their ideas for service development. In relation to the most helpful aspects of antenatal care, women reported that continuity of carer (in particular, of midwifery care), consistency of advice in relation to pregnancy and weight, being supported rather than judged, and the opportunity for interactions with midwives and with other women were most important. When asked about ideal maternity care for women who are obese, the women described in detail the opportunities that could be developed for interaction with women 'in the same boat' (Furness et al. 2011, p. 7) in person or online. Although the numbers in this study were very small it does highlight a need for sensitive personalised care and to feel 'connected' to others.

The importance of building relationships was also identified in an Australian study. In this study, Mills et al (2013) conducted face to face interviews with 14 obese women in Sydney, Australia, during their third trimester or in the early postnatal period to explore their experiences of maternity care. A central theme 'get alongside us' was identified, which related to the need for open honest communication and a partnership approach to care, in contrast to the impersonal treatment many of these women had experienced.

The importance of a partnership approach between the woman and her carer, or a perception of choice and control by women in relation to their maternity care, was reported in a seminal key document in 1993 (Department of Health (UK) 1993) and these aspects continue to be promoted (Department of Health/Partnerships for Children Families and Maternity 2007; NSW Health 2010) as foundational to quality care. The importance of personalised care has particular relevance in vulnerable populations, such

as obese women, because of the potential for improving psychological health and maximising birth outcomes.

### **2.5.2 Maternal knowledge and attitude in relation to gestational weight gain**

Understanding the context in relation to maternal knowledge, attitude and intention surrounding obesity and gestational weight gain is key to identifying the motivations of the target group.

It has been suggested that many women do not acknowledge their weight as an issue due to the 'normalisation' of obesity in society (Johnson et al. 2008). For interventions that target weight management to be successful, women need to identify themselves as having a BMI above the healthy weight range. Sui et al (2013) undertook a survey of 442 overweight or obese women in South Australia between 2010 and 2012 to evaluate a self-estimation of body weight and shape. The findings demonstrated that only one quarter of the women who were overweight or obese correctly identified their BMI, the vast majority of women significantly underestimating.

Compounding this lack of understanding is the relaxed attitude to weight gain during pregnancy, which is often held by women and by society as a whole. A core concept in a meta-analysis of studies exploring the maternity experience for women with a BMI  $\geq 30\text{kg/m}^2$  (Smith & Lavender 2011) was that women view being overweight as more socially acceptable in pregnancy, and further weight gain as inevitable during this time (compared to non-pregnancy). A widely held belief that weight loss occurs naturally in the postpartum period as a result of breastfeeding (Furness et al. 2011; Kominiarek, Vonderheid & Endres 2010) may also be partly responsible for women being unconcerned about weight gain during pregnancy.

Women's understanding of the importance of weight and weight gain influences take-up of relevant services. A qualitative study of 16 women in the UK explored their reasons for declining an antenatal service designed to assist them to achieve a healthy gestational weight gain target (Olander & Atkinson 2013). A number of reasons were identified including motivational barriers such as lack of interest, and not wanting to focus on their weight during pregnancy. The difficulties inherent in engaging women in weight management services have been experienced in several other studies (Knight & Wyatt 2011; West 2010).

Relaxed attitudes in relation to gestational weight gain may reflect a lack of awareness of health implications, and there is some evidence that increased knowledge may encourage engagement with services. The National Health and Research Council (NHMRC) funded the LIMIT Randomised Controlled Trial, involving 339 women in South Australia, which has contributed to an understanding of the impact of knowledge on subsequent gestational weight gain. In one paper originating from this study (Sui, Turnbull & Dodd 2012), the researchers focussed on overweight and obese women's understanding of the risks associated with high gestational weight gain, and their perceptions of making behaviour change. The findings demonstrated that 68% of women indicated that excessive gestational weight gain was associated with maternal complications during pregnancy and birth, but their understanding of potential neonatal complications or impact on child health was very limited. Several other studies concur with this finding (Nitert et al. 2011; Olander et al. 2011).

There is also evidence, however, that increased understanding of potential neonatal complications may support maternal behaviour change. Women interviewed for the LIMIT study in South Australia (Sui, Turnbull & Dodd 2012) and women in the UK (Heslehurst et al. 2013; Olander et al. 2011; Wiles 1998) indicated that if there was an obvious impact on the baby's health it would be a cue to action make healthier choices and to engage with weight management services.

Although there is evidence that increasing awareness might help to change attitude and behaviour, it appears that women are not receiving the information they need (Wen et al. 2010; Wilkinson & Tolcher 2010). Wilkinson et al (2010) surveyed a total of over 300 pregnant women in pregnancy in the antenatal clinic of an urban hospital in Queensland, Australia, to assess women's nutritional knowledge. More than half (55%) of the sample of women identified healthy eating as a priority and wanted nutritional information; 62% reported they had received 'basic information' from the antenatal clinic and 21% wanted more in-depth information, suggesting that current level of information is not meeting women's needs.

In addition to availability of information, the quality of the information women receive appears to be lacking. Many women experience conflicting and confusing advice regarding nutrition and activity during pregnancy, and blame lack of clear guidance on their inability to achieve healthier lifestyles. In one qualitative study of 58 African American, Caucasian and Hispanic women in the US (Ferrari et al. 2013), women complained that the advice they had received in relation to nutrition was either overwhelming, not individualised, or constantly changing according to 'shifting' official nutritional recommendations. These women also perceived that advice on activity was vague and open to interpretation.

Myths about 'eating for two' complicate women's understanding of healthy eating and activity during pregnancy. Kominiarek et al. (2010) interviewed over 100 women in the USA about their understanding of the risks of obesity, prior to their antenatal 'booking' visit. These authors found that over 30% of these women believed they should double their consumption of food during pregnancy. In terms of generalisability, this finding should be treated with caution as it may result from beliefs that are USA culture-specific, and therefore cannot necessarily be applied to other countries such as Australia.



It seems that women want and value gestational weight gain advice from their maternity care providers when it is presented in a sensitive and consistent manner (Kominiarek, Vonderheid & Endres 2010; Olander et al. 2011; Wilkinson 2012). In addition, it appears that when women are advised regarding a target weight gain for pregnancy, they are more likely to make efforts to achieve it; a study of 2237 pregnant women in the USA demonstrated that targeted weight gain advice was strongly associated with actual weight gain in pregnancy (Cogswell et al. 1999). Despite this evidence, qualitative studies demonstrate that women internationally report no advice (Thompson et al. 2011), incorrect advice (Stengel et al. 2012) or inconsistent advice (Wiles 1998) in relation to gestational weight gain. In addition, where there is a lack of information from health professionals women take away the message that it is not important (Keenan & Stapleton 2010; Olander et al. 2011).

### **2.5.3 Maternal motivation for change**

Although knowledge and attitude are important, they are not sufficient to change behaviour. As part of the LIMIT randomised controlled trial in South Australia (Sui, Turnbull & Dodd 2012), 464 women completed a questionnaire about their views in relation to making healthy lifestyle changes. The study found that 81% of respondents reported that they knew how to eat 'healthily' at the outset, and 74% planned to eat healthily and exercise during pregnancy. Several barriers to these intentions were identified in the qualitative findings of this study: lack of time, lack of support from family, lack of knowledge and not liking cooking or exercising. These are important societal considerations, suggesting that an intervention designed to help manage weight gain during pregnancy needs to take into account the broad influence of the women's friends, family and community.

A major barrier to behaviour change appears to be self-efficacy. Self-efficacy refers to an individual's beliefs regarding their ability and competence to make the behavioural changes required to achieve goals such as weight management (Byrne, Barry & Petry

2012). In an older study by Wiles (1998) in the UK, 37 overweight women who were receiving antenatal care in various different settings were interviewed to examine their beliefs about gestational weight gain. The study found that although women were concerned about weight gain they lacked confidence in their ability to control their weight. In common with Wiles' study, and almost 15 years later, the Australian study by Sui et al. (2012) (referred to previously) demonstrated that although almost all the women acknowledged the importance of making healthy behaviour changes, only 58% felt confident in their ability to do.

#### **2.5.4 Summary - the views and beliefs of obese women**

Evidence demonstrates that obese women experience discomfort, embarrassment, and a sense of disconnection as a result of insensitive antenatal care. Weight gain during pregnancy is seen by women as inevitable but transient, and there is a perception that excessive weight gain will be lost naturally postnatally. Women lack accurate information about appropriate weight gain and subsequently many pregnant women lack concern, considering that if weight gain is not mentioned by their maternity care provider than it is not important. Knowledge of the maternal risks of excessive gestational weight gain in pregnancy is generally accurate, but knowledge of potential neonatal complications is more limited. A number of women intend to eat healthily and exercise during pregnancy but there are considerable barriers that prevent them from doing so.

### **2.6 The knowledge, attitudes and practice of health professionals in relation to obesity and gestational weight gain**

In order to maximise their ability to attain a healthy weight gain, women need evidence-based, consistent advice in relation to eating and exercise during pregnancy. The knowledge, attitudes and practice of maternity care providers strongly influence the messages that women receive. Studies in Australia (Davis et al. 2012; Schmied et al. 2011; Willcox et al. 2012) and internationally (Chang et al. 2013; Furness et al. 2011; Stotland,

Gilbert & Bogetz 2010) demonstrate similar findings in relation to an evidence practice gap between what maternity care providers know, and what they do, in relation to gestational weight gain. These studies show that the majority of providers report obesity and weight gain as important issues, but they face numerous barriers to effective practice. These include a reluctance to provide advice, inadequate expertise and knowledge, a perception that their words would make little difference to the weight gain outcome, and concerns that weight is a sensitive topic that woman may perceive as personal criticism. These issues are explored further below.

### **2.6.1 Reluctance to provide advice**

Providing information to women about the importance of healthy eating, activity and weight gain is an integral requirement in both the UK (Modder & Fitzsimon 2010; National Institute for Health and Clinical Excellence 2010), the USA (Rasmussen & Yaktine 2009) and Australian clinical practice guidelines (Australian Health Ministers' Advisory Council 2012). However, availability and dissemination of guidelines alone do not necessarily change practice. Studies in Australia and internationally suggest that many maternity care providers only provide information if requested by the woman (Chang et al. 2013; de Jersey et al. 2012; Stewart, Wallace & Allan 2012; Willcox et al. 2012).

Despite the fact that the IOM guidelines have existed for over two decades in the USA, recent studies have shown that between 41% (Phelan, Phipps, et al. 2011) and 49% (Ferrari et al. 2013) of pregnant women in the USA still report receiving no advice regarding gestational weight gain. In Queensland, Australia, Wilkinson and Stapleton (2012) surveyed 73 obstetric, midwifery and allied health staff a year after the introduction of the Queensland Statewide clinical practice guideline for obesity (Queensland Government 2010). Despite 88% of the participants identifying obesity as an important, or very important, maternity health issue, only 32% were aware of the Statewide guideline. Less than 8% were able to identify appropriate gestational weight gain goals for the various BMI categories, and 25% responded that they did not provide

women with any advice on this issue. In this study, the participants identified that they did not have sufficient knowledge and would like more training to support women to achieve a healthy weight gain.

Reluctance to provide advice is also associated with anxiety in relation to how the advice will be perceived. Midwives, in particular, have identified that discussing a woman's weight requires a sensitive and careful approach, and have raised concerns about adversely affecting their relationships with women by raising this issue (Schmied et al. 2011). Several studies report that practitioners are also concerned about causing inappropriate anxiety about weight gain (de Jersey et al. 2012; Furness et al. 2011; Stewart, Wallace & Allan 2012), which may be associated with awareness of body image and eating disorders among the population. Wilcox et al. (2012) interviewed 15 midwives from two hospitals in Victoria, Australia, to investigate their views, opinions, and practice in relation to promoting a healthy gestational weight gain. The midwives in this study associated their reluctance to discuss a woman's weight with concern over causing the women 'psychological harm' through anxiety about weight gain.

### **2.6.2 Inadequate expertise and knowledge**

Failure to counsel women about weight gain has been blamed to some extent on a lack of knowledge and expertise. Several studies in Australia (Biro et al. 2013; Schmied et al. 2011; Stewart, Wallace & Allan 2012) demonstrate that midwives, obstetricians and GPs are concerned about this issue. Whilst awareness of the adverse consequences of obesity in pregnancy amongst maternity care providers in Australia seems high, that of excessive weight gain is questionable. In the Australian study mentioned above, 15 midwives in Victoria from both an urban and a rural maternity hospital were interviewed in relation to their attitudes and approaches to the assessment and promotion of gestational weight gain (Willcox et al. 2012). The majority of midwives identified gestational diabetes, preeclampsia and complicated deliveries as potential consequences of excessive gestational weight gain, but only two suggested implications for the fetus, such as

macrosomia. Similarly, in an Australian study of 28 GPs from both NSW and Victoria, the GPs identified gestational diabetes as a consequence of excessive weight gain, but failed to recognise a link to childhood obesity (van der Pligt et al. 2011).

Inadequate expertise and knowledge may present both barriers and enablers to the use of clinical practice guidelines, even where they do exist. Herring et al (Herring, Platek & Elliott 2010) suggest that a lack of sufficient knowledge to deliver appropriate, evidence-based care, and the confidence to initiate conversations around weight management determine to what degree staff comply with gestational weight gain guidelines. Although gaps in knowledge and skills may be exposed through the introduction of a clinical guideline, they can also act positively as a driver for improving practice. In a cross-sectional survey of 335 Australian midwives' practice and obese pregnant women, Biro et al (2013) demonstrated that those using a clinical guideline were more likely to report a greater confidence in providing information and counselling to a woman about her weight, and a greater likelihood of receiving education and training in relation to these issues. The recent publication of several clinical guidelines (Australian Health Ministers' Advisory Council 2012; National Health and Medical Research Council 2013a; Queensland Government 2010) in relation to gestational weight gain therefore have the potential to initiate practice change in Australia, although additional support is required in terms of education and training.

### **2.6.3 Lack of confidence**

Maternity care providers themselves cite lack of confidence as a reason for not broaching the subject of weight and weight gain with pregnant women (Biro et al. 2013; Heslehurst et al. 2012; Olander et al. 2011). Lack of confidence in these studies is related to ability; both in terms of knowledge and communication skills. Evidence has shown that confidence with own body weight also affects clinicians' counselling rates with women about weight management (Herring, Platek & Elliott 2010; Schmied et al. 2011). A recent Australian study (Wilkinson, Poole & Stapleton 2013) surveyed 73 maternity care

providers, obstetricians, midwives and allied health staff in a tertiary hospital. The study aimed to investigate characteristics that influence delivery of care according to the Queensland Guidelines. The study found that the BMI of staff was associated with self-efficacy in relation to women's weight gain; satisfaction with their own weight was associated with their belief in women being able to make the changes that they recommended.

Maternity care providers have reported that they feel their advice to overweight and obese women is largely ineffective in relation to weight management. There is some evidence that such lack of confidence, or lack of self-efficacy, results in selection bias. A study in the USA by Phelan et al (2011) of over 400 women investigated the experience of gestational weight gain advice from the woman's perspective, and compared the advice normal weight women received with that of overweight women. The results suggested that maternity care providers are selective towards those who are more likely to change their behaviour, perhaps reflecting the confidence of the provider in the efficacy of their counselling skills. The study demonstrated that factors associated with women not receiving weight gain advice were lower income, younger age, and multiparity, and that women who were overweight or obese were advised to over-gain compared to normal weight women. This finding suggests therefore that the women who most need accurate and consistent advice are most likely not to receive it.

#### **2.6.4 Summary - the knowledge, attitudes and practice of health professionals**

In Australia and internationally, maternity provider advice in relation to gestational weight gain is inconsistent. Although many providers are aware of the adverse consequences of overweight and obesity in pregnancy it is not clear if this knowledge extends to gestational weight gain. Adherence to practice guidelines is influenced by knowledge, skills and confidence, and maternity care providers note they need support and training in these areas. There are particular concerns among midwives in regard to how to

communicate with obese pregnant women without damaging the relationship, or making the woman over anxious about her weight. The provider's confidence influences self-efficacy in relation to the ability to support the woman to manage her weight successfully during pregnancy.

## 2.7 Evidence summary

This evidence review has explored the literature in relation to obesity, gestational weight gain, strategies and interventions designed to influence gestational weight gain, and the experiences, views and opinions of women and health professionals. The review has also enabled a better understanding of the context for an intervention designed to support women in NSW, Australia to achieve a healthy gestational weight gain. The evidence highlighted in this review is summarised in Table 3.

**Table 3: Summary of the evidence reviewed in Chapter 2**

Context	Evidence summary
<b>Epidemiological</b>	Rates of obesity in Australia are continuing to rise. Over 50% of women of childbearing age are overweight or obese
	Young women (of reproductive age) in Australia are gaining weight faster than any other population group
	The rates of overweight and obesity among the antenatal population and the prevalence of excessive weight gain in Australia is largely unknown
	Pregnancy is an independent risk factor for obesity
	Women who are already overweight or obese are 2-6 times more likely to gain excessive weight during pregnancy
	Excessive weight gain in pregnancy predisposes a woman to perinatal complications, independent of her pre-pregnancy BMI
<b>Societal</b>	Obesity is becoming 'normalised' in society
	A relaxed attitude to weight gain is encouraged during pregnancy
	Myths are perpetuated in society: <ul style="list-style-type: none"> <li>- Eating for two</li> <li>- Weight will be lost naturally postnatally</li> </ul>
<b>Policy</b>	Gestational weight gain guidelines have existed in the US since 1990. These are cited/recommended in several recent Australian guidelines
<b>Research</b>	Dietary and physical activity interventions can result in lower gestational weight gain. Dietary interventions are more likely to result in lower gestational weight gain
	Lifestyle interventions show mixed results in pregnancy. Some interventions are

Context	Evidence summary
	only successful in selected population groups
	The 'How' and 'Why' (the mechanisms) of successful interventions are not clear
	Providing women with a target weight gain, ensuring intensive and frequent contact and psychological support such as motivational interviewing and personal goal setting have been shown to be helpful strategies.
Practice	Weight gain is not routinely discussed or recorded at each visit
Health Service	There appear to be very few services in Australia that offer support for achieving a healthy weight gain during pregnancy
	Weight management interventions need to start as early as possible in pregnancy
	Weight management in antenatal groups has shown mixed results, but there is some support from obese women for social/peer support during pregnancy
Consumer	Weight gain is seen as an inevitable component of pregnancy
Consumer (cont)	Women receive mixed messages in relation to weight gain during pregnancy
	The relationship between excessive weight gain and neonatal complications is poorly understood by women
	Women are motivated at the outset of pregnancy to attain healthier lifestyles but experience barriers such as lack of time, knowledge and social support
	Lack of self-efficacy in relation to weight management during pregnancy
	Obese women experience a greater number of carers due to complications during pregnancy, and to report de-personalisation of their care as a result
Professional	Reluctance to provide weight and weight gain advice despite knowledge of adverse maternal and neonatal outcomes
	Fear of damaging the relationship with the woman
	Inadequate knowledge and expertise in relation to the provision of weight gain advice
	Personal BMI affects willingness to counsel women about weight and weight gain
	Lack of self-efficacy in relation to effectiveness of weight management support during pregnancy

The next section will highlight the research gap and how my study will contribute to the growing body of knowledge in this field.

## 2.8 The research gap – what is known and not known

Research in the fields of obesity and weight gain during pregnancy has grown exponentially over the past decade, and evidence is now well substantiated in some fields, particularly in relation to the perinatal risks associated with obesity and excessive gestational weight gain. What is less well understood is how to translate research



successfully into practical strategies to support women to manage weight gain effectively during pregnancy. This section provides an analysis of this research gap.

It is well documented that rates of obesity continue to rise worldwide, impacting negatively on the health of individuals and their families, health services and healthcare costs. Pregnancy is recognised as an independent risk factor for obesity, and therefore the reproductive years pose a particular hazard for women's weight across the life course. The resurgence of interest in gestational weight gain is a relatively recent phenomenon, reflecting the concern of clinicians, researchers and policy makers in its potential to 'stem the tide' of cumulative weight gain and maximise maternal and neonatal health.

Pregnancy is considered an opportune time for healthcare services to engage women in making lifestyle changes when they are motivated to make healthier choices, and this knowledge has inspired the development of a large number of international lifestyle intervention trials over the past decade. Trials are of mixed quality however, preventing the development of evidence-based recommendations for practice. Differences in intervention design, content, delivery and evaluation, combined with under-reporting of the intervention mean that the mechanisms that bring about behaviour change are not clear. Furthermore, many interventions are resource intensive, rendering them unsustainable in the long term.

It is well understood that women who are obese at the outset of pregnancy are at particular risk of perinatal morbidity and mortality, which rises in line with pre-pregnancy BMI. Women who are obese are also more likely to gain excessive weight during pregnancy than women who are underweight or of normal weight, increasing their risk of cumulative weight gain and impacting on their overall health. This knowledge suggests that this is a group who would benefit most from an intervention tailored particularly to their needs. The limited research available in relation to obese women's experiences suggests that women would value a tailored intervention or model of care during

pregnancy that would more effectively meet their needs for sensitive and individualised care and accurate information. This area is however, under-researched and the essential factors of such an intervention are not well understood.

In comparison, the attitudes of health professionals to obesity and their needs in relation to practice have been well researched. Evidence demonstrates that clinicians recognise that obesity is an important issue, but are unlikely to raise the subject with women due to inadequate skills and knowledge, and fear of damaging the relationship. Although many providers are aware of the adverse consequences of obesity in pregnancy it is not clear how far this knowledge extends to gestational weight gain. Studies have demonstrated that both women and clinicians lack self-efficacy in relation to change; women perceive that they can do little to control their weight during pregnancy and clinicians feel largely ineffective in relation to weight management. It is not well understood how these needs might be best met in practice.

At the time of writing, there are few antenatal services or models of care in Australia that address weight gain, or the particular needs of obese women during pregnancy. There is a need to develop such an intervention that is both acceptable to women and to maternity care providers, and is resource efficient in an environment where over 50% of women booking for antenatal care are overweight or obese. Such an intervention needs to not only be developed and implemented, but appropriately and effectively evaluated in order to determine the key factors that need to operate in order to effect change. The lack of robust evaluation has been a criticism of many published intervention studies; specifically an understanding of the mechanisms of change, or how and why change occurs.

These gaps will be addressed by this thesis which will describe the development, implementation and evaluation of a complex intervention in NSW, Australia, designed to support obese women to achieve a healthy weight gain during pregnancy. The realist evaluation methodology has been deliberately selected to enable an understanding of how the intervention works or does not work in the 'real world', thereby exploring its

future potential for wider implementation. The next chapter describes the realist evaluation framework and the methodology for my study in more detail.

## **CHAPTER 3 - METHODOLOGY**

### **3.1 Introduction**

My study evaluated a complex healthcare intervention, implemented in two different locations in Sydney, Australia. A theory-driven evaluation approach, specifically using the realist evaluation framework, was employed to develop theory around what works for whom and in which circumstances. This chapter was originally written in 2011 at the outset of my study, when it reflected the state of play of the methodology at that time, and to a large extent informed the process of my research. In the intervening years the use of realist evaluation has created much debate as evaluation methodology has evolved, thanks in large part to the interest of leading researchers and academics. The potential for the future of the methodology is explored in the final chapter of this thesis.

This introductory chapter traces the development of theory-driven approaches, introduces realist evaluation and its theoretical underpinning of critical realism, and describes the use of the realist evaluation framework in practice.

### **3.2 The development of theory-driven evaluation**

‘Evaluate’ has its root in the word ‘value’, and, in the Latin translation, it closely aligns with the concept of ‘worth’ (Mark, Greene & Shaw 2007). Evaluation measures have become increasingly important to policy makers and financiers of health services in recent years (Lazenbatt 2002). Evaluation is often driven by a necessity to demonstrate that improvements in practice and service delivery have occurred, particularly in terms of cost-effectiveness (Redfern, Christian & Norman 2003). In addition, public services such as health and education increasingly require practitioners to be accountable for providing evidence-based interventions or programs that deliver value for money (Timmins & Miller 2007).

Traditionally, the evaluation of interventions, or programs, has used an experimental outcomes-based approach to demonstrate impact (Clarke 1999). In this type of evaluation, the outcomes of the intervention are the primary topics of interest. In order to measure outcomes, an intervention group (where the intervention is used) and a control group (where 'normal practice' is used) are often studied in order to compare differences at the end of a period of implementation. However, healthcare interventions are often complex, consisting of multiple interrelated and interdependent components. When evaluating a complex intervention, focusing on the outcome alone is unlikely to reveal sufficient information about the future potential. For this reason, outcomes-based evaluations have been criticised for their 'blunt instrument' approach which assumes that the outcomes for participants in either group will be equal (Byng et al. 2008, p274).

Showing that a specific outcome follows a particular intervention does not necessarily lead to a full explanation of why and how it works (Pawson & Tilley 1997). Outcomes may vary in different circumstances and are often related to context; for example the relationships between the people involved and the characteristics of the setting where the intervention is implemented. Outcomes may also be affected simply because participants know they are being studied as recipients of an intervention, and may change their behaviour accordingly. This is known as the 'Hawthorne effect' (Burns & Grove 2005). The Hawthorne effect has the potential to alter, or contaminate, study results by reflecting the change that has occurred through the research process, rather than the change that has occurred through the intervention. A combined approach to evaluation, consisting of comparing the effects (outcomes) of an intervention with a consideration of how the outcomes are actually produced (the process), can be used to increase validity and strengthen a study design (Lazenbatt 2002).

Process evaluation, first described by Patton (1987), is often used by researchers in combination with randomised controlled trials for example, in order to analyse other factors that may be responsible for an intervention's perceived success or failure (Byng et

al. 2008). A process evaluation can explain discrepancies between expected and observed outcomes in order to understand how context influences outcomes for example, or to provide insight to aid implementation (Craig et al. 2008). Clarke (1999) argues that exploring these factors is crucial to understanding and therefore a form of process evaluation should be an integral element to any comprehensive evaluation strategy .

Over the past two decades, process evaluation has become increasingly analytical in examining how interventions work, for whom and in which circumstances. During the 1980s, Chen and Rossi (1987) and other social researchers developed the ‘theory-based’ approach, sometimes referred to as ‘theory-driven’ approach, in relation to the evaluation of interventions (Marchal, Dedzo & Kegels 2010, p2). The intention of this approach is to build an evaluation model or conceptual framework that takes into account the theory underpinning the intervention, or what makes the intervention work. In this way, the underpinning theory drives the design of the intervention and the data collection methods of the evaluation.

Fitz-Gibbon and Morris (1996), advocates of theory-driven evaluation, maintain that that evaluation is primarily concerned with providing information for decision makers who need to know which guiding concepts, or theories, will work in most situations. The theory of social support for example, may be inherent in the success of an intervention designed to increase the duration of breastfeeding amongst teenage mothers, or the theory of self-efficacy in commercial weight loss programs. For this reason the theory-driven approach to evaluation is often described as getting inside the ‘black box’ of a program to identify how and why interventions work in particular circumstances (McEvoy & Richards 2003, p 415). The realist evaluation framework is a method of applying theory-driven evaluation and is discussed in more detail in the next section.

### 3.3 Realist evaluation

The realist evaluation framework, attributed to Pawson and Tilley (1997), is essentially a method of evaluation that aims to explore and develop theories of how and why complex interventions work. The framework was initially termed 'realistic' evaluation in the original work (Pawson & Tilley 1997), but since this time writers and researchers have tended to favour the term 'realist' to describe the method (Henry, Mark & Julnes 1998; Kazi 2003). Kazi, for example, states a preference for 'realist' evaluation suggesting that it implies an emphatic use of, rather than a tendency towards, realism. In view of the term 'realist' being increasingly the preferred nomenclature of other authors, and because real world evaluation must inevitably be realistic, Pawson and Tilley (2004) have suggested consensus with the term 'realist', although the original 'realistic evaluation' framework remains unchanged. The realist evaluation approach has gained prominence in recent years, although the term 'realistic' still continues to be used by many contemporary researchers (Byng, Norman & Redfern 2005; McGaughey et al. 2010; Wand, White & Patching 2010a).

Pawson (2006b, p21) describes realist evaluation as 'a tool for dissecting the workings of social interventions'. In a realist evaluation, the focus is not on the observed outcomes of the evaluation, but on a study of what works for whom and in which circumstances. Realist evaluation maintains that social programs, or interventions, involve a process of choice on behalf of the recipients (Blamey & Mackenzie 2007), rather than the recipients being subjects, as in an intervention study or randomised controlled trial. Blamey and McKenzie (2007) maintain that within the realist evaluation framework people are therefore the critical element in any intervention with a social context, and it is the individuals who cause the intervention to work, not the intervention itself.

Following this approach, Wand et al. (2010b) suggests that healthcare interventions offer a range of opportunities and whether they are utilised, or 'cashed in' (Wand, White &

Patching 2010b, p717), depends on the choices people make. In considering what works for whom and in which circumstances, as in a realist evaluation, choice should be seen as the potential change agent (Timmins & Miller 2007). People can choose or not, for example, to take advantage of certain resources provided with the intention of improving their health such as attending group sessions, or utilising telephone support intended to encourage lifestyle behaviour change. In the evaluation of healthcare interventions it is therefore essential to understand how and why individuals make the choices that they do. Pawson and Tilley (1997, p188) state 'we cannot simply treat programs as things, we have to follow them through to the choices made by recipients'. Developing initial theory to explain why people choose to engage in a healthcare intervention, and then testing this theory, is key to the realist evaluation framework, hence its 'theory-driven' basis.

Searching 'why' and 'how' is therefore central to the realist approach to evaluation; these explanations are known as 'causal mechanisms' (Maxwell 2012). Pawson (2006b, p. 25) argued that a lack of attention to these processes is a major flaw in most 'evidence-based' approaches to research: 'the nature of causality in social programs is such that any synthesis of evidence on whether they will work will need to investigate how they work'. Causation has largely been the territory of experimental researchers, but an alternative view exists; that of a 'process' conception of causality (Donmoyer 2012), where the processes (or mechanisms) in social programs occur only in the presence of particular contexts and lead to outcomes that are specific to that program. This 'local' perspective is central to realist evaluation and is explored in more depth later in this chapter.

The realist evaluation framework is based on a critical realist perspective which aims to evaluate the complexities of practice within the realities of society (Kazi 2003). This theoretical stance is fundamental to an explanation of realist evaluation methodology and therefore is described in more detail below.



### **3.3.1 Critical realism**

Realist evaluation is derived from critical realism, a term that describes the work of a number of philosophers and is concerned with an analysis of the social world (McEvoy & Richards 2003). Critical realism is a scientific philosophy which aims to explain the structures and mechanisms that make up the social world. The 'critical' component refers to a need to question what is actually real, beyond what is immediately evident or experienced. 'Realism' is the external and independent reality that exists separate to personal perception (Bergin, Wells & Owen 2008). Critical realism supports a range of research methods, including both quantitative and qualitative, but the choice depends on the type and focus of the study (Bergin, Wells & Owen 2008). Pawson and Tilley describe their original contribution to theory-driven evaluation, that of realist evaluation, as the first to rest on 'realist principles' (Pawson & Tilley 1997, p55).

One of the most influential philosophers in the field of critical realism is Roy Bhaskar, who has continued to develop and refine this philosophy since the late 1970s (Archer et al. 1998). Bhaskar is influential in Europe in regard to critical realism, whereas in the USA, philosophers such as Bunge and Boyd are quoted as having a similar philosophical approach known as 'scientific realism' (McEvoy & Richards 2003). For critical (or scientific) realists, the main purpose of scientific inquiry is to understand what causes change to occur in the real world; Bhaskar for example, states 'the world cannot be rationally changed unless it is adequately interpreted' (1989, p5). Accurate interpretation is therefore vital to initial understanding, but the causative factors of change (the 'how') are often invisible, or not able to be measured, and may be missed during an outcomes-based research process. Critical realism helps to address this by trying to understand the causative factors (or mechanisms) that bring about change and how they are triggered. This understanding of the world may subsequently be used to bring about social change, in many cases where health inequalities exist.

Various authors have used Bhaskar's philosophical work to explain how it underpins theory-driven evaluation approaches (Blamey & Mackenzie 2007; Connelly 2007; McEvoy & Richards 2003). McEvoy and Richards (2003) identify three main features of Bhaskar's critical realist philosophy that help to explain the foundations of realist evaluation theory. Firstly, the existence of 'generative mechanisms' that explain how and why change occurs; these may only be identified through their effects and are therefore not always directly obvious. They may also be latent, and only operate (become activated or triggered) under certain circumstances, explaining to a large extent why some program outcomes are not consistent. Giving up smoking for example, may be dependent on the person's recent experience of family or personal illness. A severe case of bronchitis may equally trigger a change in health behaviour and cause an individual to commit to anti-smoking group therapy, where previously the individual has been resistant to change. An appreciation of context is therefore vital in relation to identifying a cause for change and understanding any 'generalisable causal pathways' that may exist (Blamey & Mackenzie 2007, p441).

Change may not occur in the same way in a different context and therefore may be difficult to replicate. The second feature of Bhaskar's critical realist philosophy is that the social world is multilayered or stratified and the mechanisms that bring about change operate at different levels of reality (McEvoy & Richards 2003). These various levels of reality mean that different mechanisms may operate for different individuals, so for example, what works for one, may not work for another. One woman for example, may find the incentive of being pregnant sufficient to enable her to forgo alcohol during pregnancy, whilst another may rely on several glasses of wine as her tangible 'reward' at the end of a long day. Thirdly, the social structures that exist can enable (or inhibit) human behaviour, and have the potential to change the outcome of a program or intervention. This may go some way to explaining why interventions work in some circumstances and locations and not others (Wand, White & Patching 2010a). The belief systems that operate in some cultures for example, in relation to tradition during pregnancy and childbirth, might inhibit change in eating or exercise behaviour amongst these groups of women.

There are several examples where realist evaluation, underpinned by critical realism, has been used as a tool to evaluate complex public health interventions where social change was the aim (Connelly 2007). Examples include Pawson and Tilley's (1997) original work on evaluating complex interventions concerning prison education, and on crime reduction in small businesses in the UK. In the prison education example, educational strategies appeared to work for some groups of offenders but not for others in terms of re-offending behaviour. The study aimed to develop an understanding of the 'generative mechanisms' that enabled educational programs to have a positive influence on re-offending behaviour, and provide some explanations about what triggered change in some offenders and not others. The study was suited to a realist evaluation design in terms of its participant complexity (different offences, different age groups and different educational levels), and the need to explore the detail around how and why educational strategies provide benefit for particular prisoners.

A more contemporary effective example of a realist evaluation is in an evaluation of a Sure Start program (Smith, Prosser & Joomun 2007), a UK government initiative to reduce the effects of poverty on pre-school age children and their families living in deprived areas of the country. Sure Start programs are extremely complex, involving professionals from several disciplines working together in a family-centred manner; pooling resources, sharing premises, combining documentation and forming agreements on thresholds for formal intervention. Sure Start programs were designed for long term social change and therefore were not expected to demonstrate measurable results for many years. A realist evaluation in the meantime, helping to uncover how and why different population groups were choosing to engage with Sure Start program initiatives (the mechanisms for change) was a very useful starting point.

Such evaluations aim to demonstrate why complex interventions are seemingly successful for some and not others, or worked better at one location and not another, and go some

way to suggesting causes for these observed differences. The next section describes the use of the realist evaluation framework in practice.

### **3.4 Using the realist evaluation methodology in practice**

#### **3.4.1 The components of the realist evaluation framework**

The goal of realist evaluation is to produce a tested theory about what works for whom and in which circumstances (Pawson & Tilley 1997). The development of an initial theory, or a hypothesis, about what might work during the development phase of the intervention is therefore crucial. Realist evaluation theory is developed through examination of the relationship between three components: **Context** (C), **Mechanism** (M) and **Outcome** (O). ‘Context’ refers to the features (physical, cultural, social and even financial) that exist when an intervention is introduced. The ‘mechanism’ is the process that brings about change, a process which may need to be actively ‘surfaced’ as it may not be immediately obvious (Byng, Norman & Redfern 2005, p. 89). The ‘outcome’ is the intended, or unintended consequence (Pawson & Tilley 2004).

The relationships between these factors are known as Context-Mechanism-Outcome (CMO) configurations and are based on the main features of critical realism; that is, the discovery of causal mechanisms or variables, that operate at various levels of reality to bring about change. Following this approach, any intervention or program must be understood within the context in which it is delivered, human behaviour (people’s actions or engagement), and the mechanisms for change (whether evident or not) (Wand, White & Patching 2010a). The configurations form the conceptual models or initial hypotheses of what will make the program, or intervention, work; amongst whom, and in which conditions, to bring about change (Gray 2004). The hypotheses are configured initially during the intervention design period, and subsequently ‘tested’ during the evaluation process.

**Context** refers to the significant features of the setting into which the intervention is introduced. The setting can be described in terms of standard measures (such as demographic or geographic indicators), documented evidence (such as previous research or investigations), systems of social or institutional relationships, or individual perceptions (provided through user surveys, focus groups or interviews). Gaining a depth of understanding of what is contextually important is essential to the design of a well-targeted intervention, and requires adequate planning and preparation time. Examining the existing context provides a clue to the factors that may act as potential constraints or enablers and allows for the formulation of initial theory about what might work to bring about change in this particular situation.

**Mechanisms** describe the strategies, resources or factors that bring about change, and how the intervention works beneath the surface. Astbury and Leeuw (2010, p. 368) describe these as ‘underlying entities, processes, or [social] structures which operate in particular contexts to generate outcomes of interest’. Mechanisms can be tangible, invisible, intentional or unexpected. Mechanisms can be either enablers or barriers to change and are dependent on the context in which they exist. In turn, the outcomes of any intervention are dependent on the mechanisms (Pawson 2003), and therefore identifying these mechanisms is pivotal to any realistic evaluation (Byng, Norman & Redfern 2005). The identification of mechanisms occurs through the research process, specifically through consultation with stakeholders whose experiences (and outcomes) will reveal preferences and perhaps previously hidden influences that may be acting as the ‘active ingredients’ for change.

‘Intentional’ mechanisms (such as offering nicotine patches as part of a smoking cessation intervention) are specifically designed to effect change, but will only work for some and not others. The degree of engagement with these mechanisms will depend on people’s preferences and choices (Pawson & Tilley 1997), and these will depend in turn on the context of their lives; their personal values, beliefs, current circumstances and previous

life experiences. The development of theory around what works and why, may be used for example, to precede a randomized controlled in order to develop a theoretical basis for a chosen treatment. The Medical Research Council in the UK stresses the importance of understanding the 'mechanism for action' as a prerequisite for the formal outcome evaluation of a complex intervention (Medical Research Council 2000, p4).

Wand et al. (2010b) maintain that successful healthcare interventions exist where the mechanisms, through a process of weaving the correct combination of resources together, manage to engage the majority of the participants. In line with this thinking, the interpretation of 'mechanisms' by researchers has changed over the time of this thesis. Mechanisms have more recently become known either as 'resources', aligned with context, or as the 'reasoning' of participants as they respond to these resources (Dalkin et al. 2015). The development of the realist evaluation process, and more specifically the meaning of mechanisms, is discussed in more depth in Chapter 9.

Pawson and Tilley (1997) define the process of identifying mechanisms as an analytical inquiry of causation. Causation in the context of any program evaluation is therefore important in order to understand what factors lead to change, and is an important concept in relation to critical realism as described previously. Understanding these factors also increases the likelihood of successful transferability, or implementation of a program or intervention in another location.

**Outcomes** are described by Pawson and Tilley (2004) as patterns, comprising the intended and unintended consequences of interventions, resulting from the activation of multiple mechanisms in different contexts. The patterns are formed during the process of analysis. It should not be forgotten that the outcomes may benefit not only the participants, but also the staff and the organisation itself (Walsh et al. 2007). Positive and negative outcomes of the evaluation are equally informative (Pawson 2002), as important information can be gained from examining negative outcomes.

### **3.4.2 Approaches to data collection**

During the data collection phase, the original CMO configurations or hypotheses are usually tested by employing a mixed method approach (Byng et al. 2008; Redfern, Christian & Norman 2003; Wand, White & Patching 2010b).

#### **Using mixed methods within the realist evaluation framework**

The goal of any mixed method research is to maximise the strengths whilst minimising the weaknesses of each method (Creswell & Plano Clark 2011; Tashakkori & Teddlie 2003).

Mixed methods are often more able to answer complex research questions (Creswell 2009) because findings are generally considered more robust if confirmed by more than one source. Wand et al. (2010b) suggest that there is no gold standard method for evaluating a single intervention, but taking a mixed position allows researchers to mix and match components that offer the best chance of answering the questions around 'what works'. There is considerable support for using mixed methods for evaluation research; Pawson and Tilley (2004) state that as the hypothesis, or initial theory, of a realist evaluation is based on contexts, mechanisms and outcomes, the data collection must be both quantitative and qualitative in order to follow up these various 'leads' (Pawson & Tilley 2004, p. 11). In complex contexts such as those that occur in public health, the World Health Organization also advocates for the use of mixed methods approaches (Green 2000), to provide a breadth of information on both processes and outcomes.

Further justification for using mixed methods for theory-driven evaluations (such as realist evaluations), is provided by Chen (2006), who maintains that in such cases the aim of mixed methods is to provide theory clarification and a holistic assessment of an intervention. Chen describes various strategies to demonstrate how quantitative and qualitative data may serve different purposes in a theory-driven evaluation. These include complementing an understanding of how and why the evaluation theory worked, or reconciling inconsistent findings by questioning participants to investigate why the theory worked for some and not others.

In most realist evaluations of healthcare interventions a variety of quantitative data is collected, such as clinical outcomes, attendance figures, and resource costs. In addition, qualitative data, such as interviews with stakeholders, field and meeting notes is sought to give clues to the causation of these outcomes. Pawson and Tilley (2004, p11) term this process as 'scavenging' for the best choice of data to test out the original theories.

### **The realist interview technique**

In terms of qualitative data collection, 'realist interviews' are different from traditional interviews in two distinct ways: the conceptual refinement process and the teacher-learner function (Pawson & Tilley 1997). These authors maintain that the traditional approach to interviewing is inappropriate when using the realist framework, because in order to comment on the workings of the intervention the participant needs to understand the underlying theory behind the design.

Pawson and Tilly (1997) propose a formula for attitude questions and conversational prompts that are designed to encourage respondents to explain their choices in relation to the intervention. Pawson (1996) suggests that the understanding (or teaching) of the contexts and outcomes should be led by the researcher. The impact of the mechanisms however, should be 'taught' by the participant because the overall aim of the interview is to investigate the reasoning, choices, and motivation of the participant. Although the researcher will have provisional expectations about what the response will be, the participant will have expert knowledge of what occurred from their own experience. The participant might say for example, 'Yes, I can see why you thought I would think [or act] that way, but in my experience it happened like this...' (Pawson 1996, p306). Pawson describes this interview formula as 'channelling' the experience of the participant (Pawson 1996, p306) by offering the opportunity to explain, clarify thinking and express an opinion or attitude, set within a specific line of enquiry.



An exchange of ideas therefore occurs throughout the interview – similar to ‘I’ll show you my theory if you show me yours’ (Pawson 1996, p307). During this process both the researcher and the participant can make a critical and informed contribution to the refinement of the hypotheses of what works and why. The theory is then refined and summarised back to the participant for confirmation. In this way there is a division of expertise and labour within the interview. This technique was used to collect qualitative data for my study and the process is explained in detail in Chapter 5.

### **Using comparative data within the realist evaluation framework**

The design of my study involves various theoretical propositions, tested through a combination of research methods, using data generated in two locations where an identical intervention was introduced (Locations A and B). Case studies, or other sources of comparative data, may be used in a realist evaluation to highlight contextual differences and explore the influences of these on the outcomes of an intervention. From a realist perspective, any outcome caused by a specific mechanism is dependent on the context in which it occurs (Walsh et al. 2007).

Comparative data are particularly useful where multiple contextual variables act on the intervention and therefore vary the outcome (Marchal, Dedzo & Kegels 2010). Rycroft-Malone et al (2010) maintain that case studies are methodologically complementary to realist evaluation because they help to explain presumed causal links that are too complex for pure experimental designs, and provide explanations for situations in which the intervention has no clear outcomes. McGaughey et al. (2010) for example, describes a multiple case study using the realist evaluation framework to examine a service initiative across four wards in two hospitals.

The type of theory created through the process of realist evaluation attempts to explain what works in a particular situation and is known as ‘middle range’ theory. The

development of middle range theory is a key purpose of realist evaluation and is therefore described in more detail in the next section.

### **3.4.3 The process of analysis and the development of middle range theory**

Pawson and Tilley (2004) maintain that there is no single method of analysis suitable for the purpose of testing the hypotheses, as the method will depend on the proposed theory and type and availability of the data. The overall purpose of the analysis is sense-making (Mark & Henry 2007), which is created through synthesis of the data. Wand et al. (2010b) claim that the integration of the data and the subsequent creation of theory are the most important elements in realist evaluation research.

Within the mixed method approach, combining quantitative and qualitative methods can occur at various stages in the research process (Creswell & Plano Clark 2011). In realist evaluation terms, the combining process (integration) occurs during the analysis stage, when the context-mechanism-outcome configurations are tested and theories of what works for whom and in which circumstances are gradually created. These theories are termed 'middle range' theories (Peterson 2009), resulting in an understanding of the key features that enable an intervention to work in a particular setting. Realist evaluation therefore begins and ends in theory, as the original hypotheses are gradually 'unravelling' (Redfern, Christian & Norman 2003, p247) tested and refined during the evaluation process.

### **Middle Range Theory**

Middle range theories are theories that lie between 'grand' abstract theories, that encompass broad concepts, and 'practice' theories which are situation-specific, although the boundaries between these three are often contentious (Peterson 2009, p36). Middle range theories have a relatively narrow focus are designed to answer discipline-specific

questions about the real world (Layder 1993), and can help to understand human behaviour. For these reasons middle range theories are increasingly being used as research frameworks; examples from social science include health promotion, health belief, social support and self-efficacy (Smith & Liehr 2008). While they only offer a limited aspect of the world, the usefulness of middle range theories lie in their ability to be relatively precise in their focus and to help understand and predict behaviour in particular contextual settings and client populations (Alligood 2010; Fawcett 2013). They can therefore assist in providing possible explanations for the degree of effectiveness of healthcare interventions (Peterson 2009).

The social researcher Robert Merton was instrumental in the development of middle range theory (Merton 1968), which he described as 'special theory', applicable only to a limited range of data (Wallace & Wolf 1999, p47). The concept of 'causation', central to the realist evaluation framework, is closely linked to the development of middle range theory. Merton maintained for example, that understanding behaviour involves establishing the causes of that behaviour, and how, which and why variables influence each other (Layder 1993) during the process.

Middle range theories can be developed inductively and deductively. Merton suggested that middle range theory is formed initially as a hypothesis, or clear theoretical idea, prior to carrying out research (Layder 1993). The hypothesis (or theory) is tested during the research process, and confirmed or adjusted accordingly as occurs during the initial design and evaluation of an intervention using the realist evaluation framework. The hypothesis is therefore formed by using a deductive or 'top down' approach by moving from broad theory to specific observations. Middle range theories are specific to the situation in which they are tested but have the potential to gradually be consolidated into broader theory, using an inductive approach, as understanding in the topic develops.

The development of middle range theory is therefore clearly applicable within the realist evaluation framework. The framework requires hypotheses, or (middle range) theories, to guide the development of a healthcare intervention in a specific context. These hypotheses are subsequently tested to understand why and how various mechanisms (or variables) produce certain outcomes. Merton favoured the use of statistical data in the development of middle range theory for the purpose of achieving precision in control and testing (McEwen 2011), but as discussed previously, mixed methods are more likely to be used in the process of realist evaluation to provide wider sources of data.

Over recent years there has been a significant increase in the use of realist evaluation research for examining complex interventions, mainly in the fields of education and healthcare. The next section briefly explores various studies that use the realist evaluation framework to evaluate complex interventions in healthcare.

#### **3.4.4 Using the findings from realist evaluation**

Generalisability is not the aim of realist evaluation research. Pawson and Tilley (1997) claim that the testing of the CMO configurations over time enables the researcher to ‘learn more and more about less and less’, as the middle range theories that are formed as a result will provide information about improvement that is less applicable at population level but more relevant to particular situations (Mackenzie et al. 2009). Single studies cannot provide an adequate basis for drawing firm conclusions, and it may require a combination of multiple studies to explain why an interventions works and under which circumstances it is likely to be most successful (McEvoy & Richards 2003).

Realist evaluation research does, however, enable a ‘real world’ approach, encouraging a wider understanding of why complex interventions may work in some circumstances and not others, thereby providing vital information in a resource-limited health service. This advantage has particular relevance for answering questions related to intervention replication and transferability across locations. The realist framework (in terms of CMO

configurations) provides a very structured and justifiable process for the planning of an intervention which is likely to be popular with service managers and funding bodies, and a continuous evaluation cycle during the implementation period has the potential to provide a change management tool.

### **3.4.5 Examples of studies using the realist evaluation framework**

The realist framework has been used to evaluate interventions of different sizes and complexity, including the whole-hospital (Marchal, Dedzo & Kegels 2010), whole-network (Hurley et al. 2010; Redfern, Christian & Norman 2003) or whole-systems (Greenhalgh et al. 2009) evaluation of change on institutions. On a smaller scale, realist evaluation has been applied in a variety of nursing intervention studies, such the development of clinical networks within palliative care (Tolson et al. 2007), a nutritional intervention during smoking cessation (Mackenzie et al. 2009), a rapid response hospital initiative (McGaughey et al. 2010), and the impact of information technology on nurses' clinical practice (Oroviogicoechea & Watson 2009).

The application of the realist framework in these studies is variably reported. Some papers describe the use of the framework in considerable detail, presenting a variety of diagrammatical representations of CMO configurations. One such example is the study by Oroviogicoechea and Watson (2009) concerning an analysis of the impact of a computerised information system on nurses' clinical practice. The CMOs in these papers are reported variously by tables, diagrams and mind maps, incorporating both statistical analysis and contextual features within the various configurations. The findings of the more detailed studies are generally well described (what worked for whom and in which circumstances) but none were located that described the process of testing or development of specific middle range theory.

The theoretical underpinning of some studies that claim to use the realist framework is not always clear. Papers were located that referred to the framework in the study abstract

or introduction, but did not provide further detail of how the framework was used during the process. One example is Hurley et al. (2010) in a paper describing the development and evaluation of unplanned care teams in Scotland. Other studies claim to use realist evaluation methods of data collection, but use only quantitative data, such as a paper by Yoffe et al. (2011) using a pre- and post-test design. Although context is described in the paper, it is not used to help understand what worked for whom and why. In a review of what features make an evaluation truly 'realistic', Byng (2011) criticises the use of pre-test and post-test designs (as in the Yoffe et al. study) as being unable to provide the depth of analysis about why and how such interventions appear to work.

Realist evaluation appears to be particularly popular for studies that evaluate psychosocial interventions within mental health (Byng, Norman & Redfern 2005; McEvoy & Richards 2003; Sword et al. 2012; Wand, White & Patching 2010b), possibly because of the significant complexity of these type of interventions. When this chapter was originally written in 2011, only two studies using realist evaluation were located that were midwifery focused: a breastfeeding support trial (Hoddinott, Britten & Pill 2010) and the implementation of a care pathway to support normal birth (Bick, Rycroft-Malone & Fontenla 2009). Neither of the midwifery focused studies used the realist evaluation framework in a structured sense, but claimed it as an 'over-arching' or 'underpinning' framework or approach. The study by Bick et al. demonstrated the discovery of several causal mechanisms to account for the outcomes of the study, but the published paper did not report the development or identification of underlying theory.

The realist evaluation framework is designed to enable several 'rounds' of program evaluation. In one particularly explanatory paper, Tolson et al. (2007) provide an in-depth description and diagrammatic representation of how the CMO configurations were used in a study concerning the development of a managed clinical network in the UK. The realist framework was 'embedded' in the implementation design, acting as a deliberate feedback mechanism for quality control and an opportunity for re-design or refinement.

CMO configurations were tested using stakeholder interviews at three stages during the first 18 months of implementation of the network. The results then formed part of a progress review to enable discussion, reflection and refinement by the Network Executive. Although Tolson et al. make reference to interesting findings in professional role development, there is no reference to the development of theory as an outcome of using the framework. The framework was judged a success in terms of its ability to provide information on how the network functioned, but it was unable to answer the question of whether it actually 'worked'. This outcome is however, true to Pawson and Tilley's own assessment of the usefulness and limitations of the framework (2004), discussed in more detail in the following section.

On reviewing the literature for this chapter during 2015 it was noted that the topic scope for realist studies was wider and the use of the methodology had become increasingly sophisticated during the intervening years. The majority of more recent studies describe the realist evaluation 'process' in some detail supported by diagrams, tables and mind maps, which appear to be now the norm rather than the exception. Of particular note are the following studies that describe the development of the initial CMO configurations (Husted et al. 2014), the building of initial program theory (Doi, Jepson & Cheyne 2015), the presentation of emerging CMO outcome patterns (Underdown, Norwood & Barlow 2013), and the testing and refining of program theory (Cheyne, Abhyankar & McCourt 2013). These studies utilise the methodology in an increasingly rigorous sense, and are evidence of its increasing popularity and refinement. This future potential for realist evaluation is described in further detail in Chapter 9 of this thesis.

### **3.4.6 Challenges and limitations of realist evaluation**

The goal of realist evaluation is to produce a tested theory about what works for whom and in which circumstances, and is applicable in principle to all forms of program evaluation (Pawson 2003). However, despite its apparent usefulness, the application of

realist evaluation methodology has apparent disadvantages compared to outcomes-based evaluations.

One of the major challenges in a realist evaluation, according to Tolson and colleagues (2007) is deciding when progress can be fairly evaluated. Some studies describe an 'end result' where the evaluation has been designed to occur at the end of a period of implementation (Byng et al. 2008). However, evaluating too early does not provide time for early difficulties to be resolved, and too late risks wasting time and resources on approaches that are not working well. Staging the evaluation has the advantage of integrating feedback into the implementation process, and can provide opportunity to re-test and further refine the original theories during the evaluation timeframe.

The findings of a realist valuation are only provisional (true to specific circumstances) which is likely to be seen as a serious limitation by those who seek a broader application. Pawson and Tilley (2004, p21) suggest that the theory developed as a result of a realist evaluation can only provide a type of 'highway code' to intervention development: the end result is not instruction on how to drive, but how to survive the journey , knowing where and when to pay particular attention along the way.

The findings of a realist evaluation are not only provisional, but mirror the nature of the intervention in terms of dynamic complexity (Kazi 2003). Pawson and Tilley (2004) caution researchers to be aware of the resource-intensive nature of realist evaluation. Due to the dynamic and unstable nature of complex interventions these authors maintain that it is especially important to place some boundaries around how much is possible when undergoing a realist evaluation within a given time frame. Boundaries should include selecting carefully which areas to focus on and which data to collect from the wide range of information available. Having collected the data, the exploration of the CMO configurations is in turn a considerable task (as there are generally many different configurations) and each configuration will provide many different alternatives, which in



turn will need to be painstakingly investigated (Mackenzie et al. 2009). Researchers need to decide early on in any evaluation which areas they will focus on in order to complete the task within a given time frame.

Developing theory through this process is time consuming, and therefore not particularly attractive to funding bodies and health service managers. However, discovering the active ingredients in any workable intervention is essential for transferability and longer term sustainability.

### **3.5 Chapter summary**

This chapter has discussed the development of theory-driven evaluation and described the realist evaluation framework in terms of the philosophy of critical realism. The use of the realist evaluation framework in practice has been explored in detail, including the components of the framework, data collection methods, analysis and subsequent development of middle range theory. The value of the realist evaluation framework has been examined in terms of its ability to assess healthcare interventions, and critiqued in terms of its challenges and limitations. The next chapter will describe the research design of my study, the application of the realist evaluation research methodology and the use of the two case studies for comparative data.

## CHAPTER 4 - THE INTERVENTION

### 4.1 Introduction

This chapter introduces the intervention that was the focus of the realist evaluation, and describes the context into which the intervention was introduced. The intervention was introduced on two sites in metropolitan Sydney (identified as Location A and B), providing comparative data for the evaluation study. The two locations in which the intervention was introduced are examined in this chapter in terms of their demographic differences and similarities. Using the realist evaluation framework methodology, the evidence supporting group antenatal care is explored and the initial theory of self-efficacy underpinning the design of the intervention is described.

#### 4.1.1 Complex interventions

An intervention is an action on, or an attempt to change, a person, group, community or organisation (Lazenbatt 2002). Complex health interventions typically mirror the real world of routine clinical practice. Examples include those where change is directed to service delivery, organisation and health professionals' behaviour (Campbell et al. 2000), such as the intervention that is the focus of my study. The Medical Research Council in the UK provides guidance on the development and evaluation of complex interventions, and the latest review (2006) also provides insight into the factors that influence the development of interventions (Craig et al. 2008). The review document suggests that ideas for complex interventions can emerge from various credible sources, but their eventual implementation often depends on a combination of political acceptability and 'fit' with other contemporary ideas.

Pawson describes complex interventions as 'complex systems thrust amidst complex systems' (Pawson 2006b, p35). From a realist perspective, Pawson describes several defining features of complex interventions that are present in most 'mainstream' systems, including healthcare. From this perspective, complex interventions are described as being

essentially theories, based on hypotheses that outcomes will be improved if the service is managed a particular way. This way of looking at interventions is in contrast to a conventionalist perspective, which would tend to view an intervention as a tangible amalgamation of resources, equipment and people.

From the realist perspective, Pawson et al. (2005) maintain that interventions are characteristically dynamic and unpredictable because they involve the active input of individuals, either implementing or participating in the intervention, in order to bring about change. Different groups are typically responsible for success or failure during implementation and often have considerable influence in terms of the progress of the intervention. In terms of transferability, Pawson (2006b) claims that complex interventions are fragile and never equally effective in terms of outcomes in different locations because they depend so heavily on social context. This means that they are very unlikely to be replicated in the same way in different localities. In terms of my study these cautions proved to be useful insights during the design stage of the project, strongly supporting the use of comparable data from two locations for the evaluation process. The next section describes this design process.

## **4.2 The design of the intervention**

The Medical Research Council (MRC) in the UK has published updated guidance for the systematic development of complex interventions designed to improve health (Craig et al. 2008). The guidance is primarily intended to help researchers choose and implement appropriate methods based on existing knowledge and the nature of the intervention. The starting point of the process is a development or design stage requiring very detailed groundwork prior to implementation.

This process initially involves the ‘identification of existing evidence’ and the ‘development of theory’ (Craig et al. 2008, pp. 980-1). In terms of the realist evaluation framework, a similar understanding of the context in terms of documented evidence,

institutional capacity and individual perception is integral to the design phase of the intervention. This subsequently leads to the development of the realist hypothesis about what will work, amongst which groups and under which conditions.

Developing the hypotheses (or theory) about what will make an intervention successful is an essential first step when planning for a realist evaluation, because it is this initial theory that must be tested during the evaluation process (Pawson & Tilley 1997). As described in the previous chapter, this underpinning theory is usually a middle range theory, relatively narrow in focus and designed to help to understand and predict human behaviour in particular contextual settings (Alligood 2010; Fawcett 2013). The following sections describe how these two stages, identification of evidence and development of theory, were explored during the original design of the intervention.

#### **4.2.1 Identification of the existing evidence**

As has been shown in Chapter 2, the prevalence of obesity has more than doubled during the last two decades and is occurring in women at a progressively younger age. The risk of increasingly adverse perinatal outcomes rises in line with body mass index (BMI), and obesity is therefore likely to be associated with the increasing acuity currently being experienced within the maternity services (Bhattacharya et al. 2007; Sarwer et al. 2006). Gaining weight during pregnancy according to recommended levels has been shown to have positive benefits for both obese women and their babies, especially in terms of reducing operative birth and maternal weight retention post-birth (Viswanathan et al. 2008). However, despite this knowledge, very few facilities in Australia offer strategies which specifically address weight management for obese women during pregnancy.

The original driver for the development of the intervention at came from women in one of the intervention locations (Location A) who complained that they were unable to book for

antenatal care at their local (level 4) maternity facility<sup>4</sup> with a BMI  $\geq 35\text{kg/m}^2$ . The justification for this policy was that this facility did not provide services for the higher acuity more likely to be required by obese women during pregnancy and childbirth. The care of these women was therefore transferred to the nearby level 5 facility after the booking in visit, irrespective of the women's state of health. As a result of user dissatisfaction, a local advisory group was formed with the intention to develop a more appropriate midwifery led model of care for obese women without medical complications.

In order to establish the need for a specific service for obese women, internal audits were conducted at Locations A and B to examine selected antenatal and birth outcomes for women of all BMIs for a 12 month period (1 July 2008 – 30 June 2009). Ethics approval was not sought because these audits were intended primarily for local planning purposes and not intended for publication. Data were collected in relation to all women with singleton pregnancies and a BMI  $\geq 18.5\text{kg/m}^2$  using the NSW Perinatal Data Collection dataset (Australian Bureau of Statistics 2011).

When the data was combined, 42% of the women across both locations were overweight or obese, and the mean BMI increased with parity. 41.6% of obese women had a caesarean birth. In line with existing studies (Bhattacharya et al. 2007; Nuthalapaty, Rouse & Owen 2004; Sebire et al. 2001), the audits on both sites demonstrated a higher incidence of complications requiring medical intervention, such as hypertension and gestational diabetes, and longer hospital stays during pregnancy and childbirth for women who were obese. The results strongly supported the need for the development of a specific antenatal service (the intervention) with the potential to encourage weight

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<sup>4</sup> Public maternity facilities in NSW are organised into levels 1-6, reflecting the availability of various additional services for pregnancy and birth. Level 6 provides tertiary referral for the most complex cases. Level 1 facilities provide basic antenatal or postnatal care, but do not provide birthing services. According to Local Health District policy, facilities are 'networked' enabling women to be transferred across levels as required, depending on clinical need.

management through lifestyle change, and improve outcomes for pregnant women with BMI  $\geq 30\text{kg/m}^2$  in these two locations.

Based on this evidence, discussions commenced initially at Location A to determine the most appropriate design for the intervention, based on existing theory underpinning successful lifestyle change.

#### **4.2.2 The use of theory to develop the intervention**

As noted previously, an intervention attempts to effect change, including behaviour change. Eating and exercise behaviour are influenced by a complex interplay of social, psychological and cultural factors (Logue 2004; Ogden 2003), and change is difficult to effect.

Successful and sustained behaviour change is achieved through a complex combination of elements, of which motivation and self-efficacy (or confidence in one's ability) are considered two of the most vital for weight management (Mitchie et al. 2008; Schwarzer & Fuchs 1995). Interventions aimed at increasing self-efficacy have been reported to result in people being more confident in their ability to self-manage their condition, more willing to make behaviour changes and more likely to change diet and exercise habits (Boyce, Robertson & Dixon 2008). For this reason, self-efficacy was identified as the middle range theory that would initially underpin the intervention design, and was later tested through the realist evaluation framework. The theory of self-efficacy originates from social cognitive theory (Bandura 1997), which facilitates the understanding of behaviour and behaviour change. Bandura (1995) differentiates between two elements of self-efficacy theory; perceptions of personal capability and outcome expectations.

The perception of ability (or perceived self-efficacy) has been shown to be an important determinant of lifestyle behaviour change (Dzewaltowski, Noble & Shaw 1990; Falko et al. 2005; Garcia & Mann 2003). People need firm confidence in their efficacy and the

expectation of achieving personal gain to start and sustain the effort required to achieve weight management. Therefore in something that takes time to succeed, like weight loss, perceived personal efficacy to a large extent predicts personal goals and performance attainment. As has been discussed in Chapter 2, self-efficacy in this context can also be viewed in relation to healthcare professionals who doubt the effectiveness of their weight management advice and are reluctant to provide weight counselling as a result. Self-efficacy can be increased however, through various means such as positive feedback, vicarious learning, verbal persuasion and the experience of positive emotions (Hyde et al. 2008). Based on this premise, buddying schemes and peer support programs have been recommended (Boyce, Robertson & Dixon 2008) as opportunities for behaviour change intervention.

Based on both the existing evidence that a different model of care was required for obese women during pregnancy, and the underpinning middle range theory of self-efficacy being the most appropriate for creating sustained behaviour change, the design of the intervention took the form of peer support through group antenatal care, for women with a pre-pregnancy BMI  $\geq 30\text{kg/m}^2$ . The aim of the intervention was to provide a collaborative antenatal model of care that assisted obese women to gain weight during pregnancy within the range recommended by the Institute of Medicine Guidelines (Rasmussen & Yaktine 2009), and was acceptable to both women and healthcare providers.

The next section describes group antenatal care in more detail and explains why this model of care was thought to be the most appropriate for the intervention.

#### **4.2.3 Group antenatal care**

The provision of antenatal care in groups has been widely implemented and well evaluated in the USA (Ickovics et al. 2011; Massey, Rising & Ickovics 2006; McDonald et al. 2014; Novick 2004; Schindler Rising, Powell Kennedy & Klima 2004) and subsequently introduced in Sydney, Australia (Teate et al. 2011) with considerable success. In the USA,

this model is known as '*CenteringPregnancy*', and the philosophy of this approach is based on the development of relationships and the provision of social support. The model combines assessment, education and support in a group setting, where women share experiences and learn vicariously from one another. Essential elements of this model include stability of the group leadership and membership, an overall plan for each session (but the emphasis may vary), and conducting the group in a circle. Women are involved in some of their healthcare activities, and ideally the majority of the health assessment occurs in the group space.

Promoting health in group settings is a strategy for behaviour change and social support in other healthcare settings (Barud et al. 2006; Scott et al. 2004). It is widely utilised by the public health system and non-government organisations to promote and sustain health behaviours; for example alcohol abstinence, smoking cessation and the practice of breastfeeding. Most weight loss treatments in the non-pregnant population are currently carried out in groups (Buckroyd & Rother 2007), and there is evidence that group programs can be more effective than individual or self-help approaches to weight management. Heshka et al. (2003), for example, demonstrated that a multi-component commercial program (Weight Watchers) was more effective in terms of weight loss and weight control over a two year period, than individual or self-help programs.

In relation to self-efficacy, group antenatal care has demonstrated positive outcomes for both women and midwives. In a randomised controlled trial (Ickovics et al. 2011) of group antenatal care amongst vulnerable groups of women in the USA, those receiving group antenatal care demonstrated increased self-esteem and lower stress levels compared to those receiving standard care. In this trial, psycho-social intervention techniques were successfully 'bundled' with antenatal care, and based on social-cognitive theory in order to promote self-efficacy. In Sydney, Australia, Teate et al (2013) demonstrated that although the midwives who facilitated antenatal group care reported initial misgivings in their new role, they experienced a growing confidence in their abilities and facilitation



skills during the time of the trial. They particularly appreciated new opportunities to develop positive relationships with women and colleagues through this model.

The review of the literature in Chapter 2 showed that gestational weight gain can be influenced through some form of individual intervention, but these have been resource intensive, making them unsustainable for a large number of women in the long term. In comparison, providing healthcare in groups has been shown to reduce the cost of care in some settings (Beck et al. 1997), and can be provided more effectively and efficiently to women in groups compared with one-to-one situations (Schindler Rising, Powell Kennedy & Klima 2004). These were naturally important considerations for the Local Health District<sup>5</sup> in which the intervention was to be introduced.

Combining antenatal care in a group setting with weight management during pregnancy and support for a healthier lifestyle had not been tested previously when the intervention was designed, although the concept was first identified in 1990 as a possible strategy for encouraging women in the USA to gain weight during pregnancy in accordance with the IOM recommendations (IOM 1990). In terms of practice, the intervention involved the inevitable challenges associated with change. Not only did the intervention aim to change the behaviour of health service recipients in order to improve health outcomes, but also aimed to address professional behaviour change within the organisation and delivery of healthcare.

The next section describes the intervention and preparation process in more detail, and introduces the locations where the intervention was implemented, highlighting contextual differences and similarities.

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<sup>5</sup> Local Health Districts (LHDs) are funded by the Australian Federal Government to manage public hospital services within defined local areas. There are eight LHDs within the Sydney metropolitan region and seven in rural and regional New South Wales.

### **4.3 Description of the intervention**

An Expression of Interest process was initiated by the former NSW Department of Health to encourage innovative antenatal service development for obese women across NSW. At this time I was not employed by the Department of Health and was therefore able to lead a Local Health District application, which was shared with another Local Health District (Location B) for the purpose of trialling an identical intervention on two sites. Funding was subsequently provided by the NSW Department of Health to cover the 'set up' costs of the intervention on both Locations A and B. The intervention was implemented simultaneously in both locations in 2010. The essential elements of the intervention, compared to standard antenatal care, are shown in Table 4.

**Table 4: The intervention compared to standard antenatal care**

Key variables	Intervention	Standard care
Antenatal care provided to a group of women who were within 6 weeks of the same gestation	Yes	No
Number of women present at each session/visit	Up to 12 women and two midwifery facilitators	One woman and one maternity care provider
Continuity of carer	Yes	No
Length of session/visit	2 hours	20 minutes
Number of sessions/visits	7 antenatal and 1 postnatal	8 - 10 antenatal
Venue (access)	Existing community health venue	Usually hospital
Session/visits incorporates antenatal/birth/parent education	Yes	No
Focus on healthy weight gain	Yes	No
Eligibility criteria	Yes (BMI >30kg/m <sup>2</sup> )	No
Weekly individual drop-in visits encouraged	Yes	No
Health professional outreach to session/visit ('one stop shop' approach)	Yes	No Referrals to another care provider as necessary
Women carry their own medical record	Yes	No

#### **4.3.1 Structure of the group sessions**

The intervention involved groups of no more than 12 women of similar gestation who met seven times during pregnancy, and once postnatally (eight group meetings in total) for two hours at a community venue. A new group commenced every six weeks on both locations, with the result that 4-5 groups were running simultaneously at each location.

The groups in both locations were facilitated by two midwives, providing women with continuity of care during their pregnancy. In line with the women's increased level of risk the intervention groups provided collaborative clinical care, shared by midwives and (at specified visits in Location A) an obstetrician. The groups were also attended on specific

occasions by a dietitian and physiotherapist who facilitated discussions around increasing activity, healthy eating, cooking or eating out as a family, and supported the women to develop and achieve their individual goals.

Clinical antenatal care, comprised of blood pressure and weight measurement, and an abdominal palpation to assess fetal, growth and presentation, movements and heart sounds, took place in the group time alongside a semi-structured program. On arrival, the women weighed themselves in private and recorded their weight directly into their own progress notes. The blood pressure measurements were taken by one of the midwives as the women settled themselves into the meeting circle. The abdominal palpations took place either to one side of the room behind a screen, or in a separate room depending on space availability. Over the two hours discussions were generated according to a loosely structured program on healthy eating (such as reading food labels, or cooking for the family), physical activity throughout pregnancy, aspects of pregnancy, birth, and other topics according to the women's choice. The emphasis in the groups was on achieving a gestational weight gain within the IOM guidelines (5-9Kg for women with a BMI  $\geq 30\text{kg/m}^2$ ), through accurate, consistent information and motivational techniques such as goal setting. The program for the group sessions can be seen in Appendix 1.

In addition to the eight group visits, the women were invited to attend a supportive weekly 'drop-in' where they could weigh themselves and have the opportunity to discuss their healthy pregnancy plan and review their personal goals with their midwives. This activity was supported by the women's WELL diary (the Weekly Eating and Lifestyle Log) which was incorporated into the antenatal hand-held notes. Women recorded their goals in the WELL diary and reviewed these at each visit as a group activity. The aim of the diary was to increase individual accountability for healthy eating and increased physical activity.

### **4.3.2 Governance of the intervention and local support**

In order to achieve consistency for evaluation purposes, the development and implementation process was managed by one steering group comprised of senior clinicians from both locations and Area Professors of Midwifery. All group facilitators were members of the local Implementation Group<sup>6</sup> at each location. They attended the monthly meetings to report on progress and request advice or assistance as required.

In order to provide local support, the project officers attended the intervention groups and provided weekly support to the facilitators for the first three months. The midwives at both locations met via teleconference on several occasions during the initial implementation period to share their experiences and to offer support to each other. At each facility one of the intervention group facilitators continued to work in the antenatal clinic at least one day each week and was able to offer advice and support to her colleagues.

### **4.3.3 Women's participation in the intervention**

Women who were obese (BMI  $\geq 30$  kg/m<sup>2</sup>) were invited to join an intervention group at their first antenatal hospital visit (known as the antenatal 'booking' visit) during a routine conversation about choices for maternity care. In both locations, women from a wide catchment area were offered the intervention. Each catchment area contained two hospitals providing maternity care, and women from both hospitals in each location were invited to participate.

Exclusions to the intervention were women with diabetes Type 1 and multiple birth pregnancies. If women presented for booking and the need for consultation with other

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<sup>6</sup> Implementation Groups were formed at each location for the purpose of supporting implementation of the intervention and problem-solving where issues arose during the first 12 months. Members included the Obstetric Lead, the Nursing and Midwifery Co-Director, Professor of Midwifery, midwifery, physiotherapy, and dietetic educators and managers, clinical risk management and quality assurance personnel, and the group facilitators. The groups were Chaired by the Project Officers on each site.

healthcare providers was identified (for example, physician, endocrinologist, mental health worker), these were arranged. Women booking with existing risk factors (such as a BMI  $\geq 35\text{kg/m}^2$ ), or where conditions were identified during pregnancy that required ongoing specialist opinion (such as gestational diabetes requiring insulin), their care was transferred as per the Local Health District policy to a higher level facility<sup>7</sup>. However, for any of these eventualities, shared care between an obstetrician or another healthcare provider and the intervention group midwives was initiated or continued, and none of these situations precluded women who met the original criteria from attending, or continuing to attend, an intervention group.

#### **4.3.4 Preparation of healthcare providers**

##### **Multidisciplinary training**

Training of healthcare providers (midwives, dietitians and physiotherapists) involved in the intervention was extensive and interdisciplinary, with all providers either training or being trained by each other. The initial 2 days training was diverse and included information on healthy eating and increasing activity in pregnancy, group facilitation skills, breastfeeding challenges, monitoring for antenatal complications associated with obesity, and talking with women about their weight. In order to improve communication skills an accredited trainer provided a 'staged' training in motivational interviewing communication skills<sup>8</sup> and encouraged practical experience between training sessions (Raymond & Clements 2013).

The training was mandated for group facilitators, and any other midwife or managers working in antenatal care at either location were invited to these training events, free of

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<sup>7</sup> Public maternity facilities in NSW are organised into levels 1-6, reflecting the clinical acuity that can be safely managed at each facility. Facilities are 'networked' according to Local Health District policy, enabling women to be transferred across levels as required, depending on clinical need.

<sup>8</sup> Motivational interviewing is a client centred, directive therapeutic communication style, aimed at exploring change and helping people to set realistic personal goals when they are ready to do so (Rollnick et al. 2010).

charge. Twenty two midwives attended these initial training events prior to the implementation of the intervention groups.

### **Communication tools**

Communication materials about the new service, such as an 'FAQ' piece in the Local Health District newsletter, articles in local newspapers, and online information for GPs, were developed and distributed at both locations at the start of the intervention in order to inform the public, familiarise health professionals and encourage referral. In addition, communication tools were designed for local use; posters and leaflets advertising the intervention, a coloured BMI chart to be used at booking as a visual aid for a conversation with women, a weight management leaflet advising on weight gain (according to BMI), healthy eating and activity, and a 'cheat sheet' for the midwives in terms of the risks of obesity and excessive weight gain.

### **The Facilitators' Handbook**

The Facilitators' Handbook was prepared jointly by the facilitators and members of the implementation groups and the Steering Committee to provide a confidence-building framework for new facilitators, loosely structured to maximise discussion at each of the eight sessions. Each session included an aspect of pregnancy, physical activity and healthy eating. The handbook was intended to standardise the group sessions (as far as possible) at both locations for evaluation purposes.

## **4.4 The intervention locations**

The intervention was introduced on two locations (A and B) simultaneously during 2010. Data were extracted from the *NSW Mothers and Babies 2010* report (NSW Department of Health 2012) to help provide a demographic comparison between the two Local Health Districts (LHDs) in which the locations were situated. A comparative table (Table 5) is

followed by a short synopsis to highlight the demographic and maternity context of the two sites at the time of implementation.

**Table 5: Demographic and maternity contexts of Location A and B**

Demographic data	Location A	Location B
Hospitals providing maternity care	1 x level 5 1x level 4	1 x level 5 1 x level 3
Total births: Level 5 hospital	2567	2496
Total births: Level 4/3 hospitals	1262	178
Normal birth rate (level 5 hospitals only)	61.8%	53.2%
Mothers aged under 25 years (LHD)*	7.0%	21.3%
Mothers born outside Australia (LHD)*	30.8%	5.8%
Mothers born in South East Asia and Southern Asia (LHD)*	18.8%	3.2%
Aboriginal and Torres Strait Islander mothers (LHD)*	2.2%	4.0%
Mothers who smoked during pregnancy (LHD)*	2.5%	15.0%
Babies formula feeding from birth (LHD)*	6.3%	15.3.0%
Distance between maternity facilities within each catchment area	9km	27km

Extracted from *NSW Mothers and Babies 2010* (NSW Department of Health 2012)

\*Demographics only available by Local Health District (LHD), not by individual facilities

**Location A** was situated 22km south of Sydney. The LHD in which Location A was situated is relatively densely populated and at the time had the third highest number of mothers giving birth in NSW in 2010. There are two hospitals within the intervention catchment area. These two facilities are 9km apart, one offering services at level 4<sup>9</sup> and the other at level 5. In comparison to the LHD in which Location B is located, the mothers in this LHD tended to be older, more likely to have been born in South East, North East or Southern Asia, and less likely to smoke during pregnancy or formula feed their babies from birth.

**Location B** was situated 76Km north of Sydney. The intervention catchment area for Location B is much larger than Location A as the area is less densely populated. Similarly

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<sup>9</sup> In NSW higher level facilities provide more complex maternity services for women with conditions considered to present a higher medical risk



to Location A, there are two hospitals within the catchment area, but these are 27km apart, one offering services at level 3 and the other at level 5. In comparison to the LHD in which Location A is situated, women living in this LHD were likely to be younger, have been born in Australia, smoke during pregnancy and formula feed their babies from birth.

#### 4.4.1 Local variation in intervention design and delivery

The intention was that the design and implementation of the intervention would be as similar as possible over both locations A and B for evaluation purposes. However, it was inevitable that local differences in demographics and healthcare organisation would necessitate a degree of variation in design and delivery of the intervention. The local variations at locations A and B that existed at the outset are presented in Table 6.

**Table 6: Variations in design and delivery of the intervention at locations A and B**

Key variables	Location A	Location B
Organisational familiarity with group antenatal care (prior experience)	Yes (2 years of prior experience in this model of care in the LHD)	No
Venue (access)	Existing community health venue used for outreach midwifery clinics	New community venue (existing Child and Family Health Centre)
Hospital obesity policy related to care during pregnancy	Updated during the implementation phase.	Yes
Offer of intervention	Women offered intervention at their booking visit in the hospital ANC	Women offered intervention prior to the booking visit and selected for booking by intervention group facilitators where possible
BMI known prior to booking visit (Information from GP)	No	Yes
Drop in visits encouraged prior to 20 weeks	Yes	No
Drop in time used to provide additional visits for women with BMI $\geq$ 35kg/m <sup>2</sup>	Yes	No

Key variables	Location A	Location B
Obstetric input	Obstetric outreach at intervention group once a month. All women seen within group time by known obstetrician at first visit. Additional input available through the routine ANC on both sites.	No obstetric outreach to community clinic No 'known' obstetrician. Routine obstetric availability through ANC. Referrals where necessary as per standard care.
Shared care arrangements	Weekly telephone or email consultations between midwives and obstetrician	No routine contact between group facilitator midwives and obstetrician
Physiotherapist visits to group	2 x per group	Nil
Dietitian visits to group	3 x per group	2 per group
Women weigh-in on arrival	Yes	Yes
Clinical care	Abdominal palpation in a separate room	Abdominal palpation in the group room
Notes	Paper notes 'Hand Held' by women	Paperless

These local variations in the design and delivery of the intervention inevitably presented challenges to both the health professionals and the women at each location, and these experiences are acknowledged in the presentation of the findings in Chapter 6. The challenge of incorporating local differences in the delivery of an intervention is true to the 'real world' (Gray 2004), and these variations illustrate well the inevitable unpredictability and potential fragility of complex interventions as described by Pawson (2006b).

## 4.5 Chapter summary

This chapter has identified the initial theory underpinning the design of the intervention and the evidence supporting group antenatal care. The intervention has been described in relation to structure and organisation, and the variations between the two locations within which the intervention was introduced have been explored. The next chapter will examine the initial hypothesis for change utilising the realist evaluation framework methodology in terms of context, mechanism and outcome configurations, and describe the research methods that were employed in the study.

## **CHAPTER 5 - RESEARCH METHODS**

### **5.1 Introduction**

This chapter describes the research methods of my study, including the ethics approval process. The study was designed according to the realist evaluation framework, and mixed methods were used with the aim of capturing the multidimensional characteristics of a complex intervention. The middle range theory of self-efficacy was considered to be the most appropriate to underpin an intervention focussed on weight management, and this theory influenced the strategies (mechanisms) hypothesised to bring about change. A variety of data were collected at both Location A and B in order to explore contextual differences and the influence of these on the outcomes of the intervention.

In accordance with the realist evaluation framework, the hypothesised relationships between context, mechanism and outcome were developed as CMO configurations during the design phase of the intervention. These were tested and refined during the analysis phase of the evaluation using a sequential combination of comparative and thematic analysis in order to build explanations for what works for whom and in which circumstances.

My role, in terms of my contribution to the design and implementation of the intervention and to the research process is clarified in the next section.

### **5.2 Clarification and awareness of my research role**

Undertaking what is described as ‘methodological self-consciousness’ (Findlay & Gough 2003) is accepted as an integral part of undertaking qualitative research (Allen 2004; Toffoli & Rudge 2006). Findlay and Gough (2003) maintain that qualitative research is co-produced between the participant and the researcher and insight into how this occurs provides further depth to the work. This section describes my parallel roles of project

officer, steering group member and researcher, and the methods I used to minimise the potential conflict and bias that could have potentially arisen as a result.

As an introduction, the setting in which my PhD research took place is described. In 2010, set-up funding was received from the (former) NSW Department of Health to implement a group model of antenatal care for obese women, with the aim of supporting women to gain weight within recommended limits (Davis et al. 2012). The funding agreement included a requirement to evaluate the model of care after 12 months of operation. The reported outcomes included women's gestational weight gain, a comparison of nutritional intake and healthy activity levels at 20 and 36 weeks, selected birth outcomes and the views of clinicians regarding the feasibility of the model of care. By December 2010 when the evaluation was conducted, only half of the women recruited to the program (81 women in total) had given birth, which limited the conclusions that could be drawn from the analysis of the data.

The realist evaluation study was initiated separately as the focus for my PhD research. The aim of my study was broader than the evaluation initiated for the Department of Health, seeking a deeper understanding of what worked, for whom and in which circumstances. A theory-driven methodology (the realist framework) was deliberately employed in order to build a model that takes into account the theory underpinning this complex intervention, to uncover essential 'ingredients' for success.

My role during the design and implementation of the intervention was both that of steering group member and project officer at Location A. My additional role during the evaluation period was that of researcher. I was aware of the potential for conflict and bias that existed in these parallel roles from the outset and the need to maintain objectivity and 'role separateness' as far as possible. Nevertheless, as Burns et al (2012) describe, I was equally aware that a more personal engagement would potentially obtain a richer

perspective. The challenge was to achieve a satisfactory 'middle ground' that provided the advantages of both (Dwyer & Buckle 2009).

As researcher, I deliberately did not attend or observe the intervention groups in action, apart from introducing the study and seeking consent from participants during a limited visit as a researcher at the first group or postnatal reunion. As a midwife employed by the hospital, I declined the opportunity to 'fill in' as a group facilitator on several occasions. This introduced a dilemma I had not been prepared for, especially when I then observed colleagues working with minimal staffing and heavy workloads, and the potential for cancellation of the group session. I reduced bias as far as possible at Location A (where I was employed) by carrying out the interviews and focus groups accompanied by another steering group member to ensure these were undertaken using a consistent and objective approach. As steering group member, I was aware of the challenges associated with implementation of the intervention, but also of the need to report in my PhD study only on those that were perceived by the research participants.

Parallel roles may also have benefits to the research process. My study uses two locations as comparative case studies. Realist evaluation requires an in-depth knowledge of local context, because context impacts significantly on the mechanisms of the intervention and the subsequent outcomes. As project officer at Location A, I was very familiar with the logistical challenges of the intervention which meant that I was able to appropriately frame my questions to the participants at the other location, specifically targeting particular issues, and adding a depth of understanding to the local context that otherwise might not have existed. These findings are described in the next chapter.

In terms of my specific contribution, I assisted with the ethics application for approval to undertake the evaluation study of the intervention for the NSW Department of Health (DoH), and made a separate application to this ethics committee during 2010 for the additional qualitative data that I collected for my realist evaluation study at both

locations. For my realist evaluation study, I obtained consent for interview from the women and the health professionals at Location A and B. I conducted interviews of all participants at both locations, accompanied on occasion by one of the steering group members. To enable an understanding of the contextual factors at Location B I had several in-depth discussions with my counterpart, the project officer in that locality, prior to undertaking those interviews. I was personally responsible for the systematic collection and input of the demographic and birth outcome data collected from the participants at Location A. The analysis of data collected from both locations for the purpose of my study was personally undertaken.

### **5.3 Ethics approval**

Ethical approval to carry out the evaluation of the intervention was sought in line with the requirements of National Statement on Ethical Conduct in Human Research (National Health and Medical Research Council the Australian Research Council and the Australian Vice-Chancellors' Committee 2015) because it involved conducting research on human participants. Multi-site ethical approval for the evaluation of the intervention was sought and gained from the Harbour/Hawkesbury Northern Sydney Central Coast Health Human Research Ethics Committee (HREC) (reference number HREC/10/HAWKE/61). Approval to conduct the research as part of my Doctorate study was also gained from the UTS Human Research Ethics Committee (UTS HREC 2010-365R). Copies of the approval letters from these two institutions are provided in Appendix 2.

Ballantine et al (2000) maintain that various considerations must be taken into account in an attempt to achieve an ethical approach to any evaluation. These authors caution that knowledge always services the vested interests of one group over another and therefore several constraints should be considered during the evaluation process. Participation in any discussion for example, must be as wide as possible to allow many 'voices' to be heard, participants must be allowed to challenge assumptions, no participant should be

able to claim hierarchical authority and all participants must openly declare any personal goals or intentions. Although Ballantine et al. originally constructed this guidance based on information systems, Gray (2004) maintains that that it is a useful guide for evaluations of any kind. These considerations in relation to my study are particularly relevant in terms of potential power imbalances between vulnerable women, health professionals and researcher, and these issues are explored further in this section.

In line with general ethical principles, research should do no harm and preferably it should be beneficial (Seedhouse 2009). The design of the study involved the use of people as research subjects and therefore a number of ethical issues were considered in order to protect them from harm (Holloway & Wheeler 2002). These considerations related to issues of consent, risks to participants, confidentiality and data storage. Consent was sought from participants (both women and health professionals) prior to the collection of data. Consent was obtained through the provision of a written information sheet and subsequently a consent form signed by both the researcher and the participant, with a copy held by both parties. The information sheet detailed the type of data to be collected, the data collection method and purpose, and how privacy and confidentiality was to be maintained. The participants were also informed that their participation was voluntary and provided with the information sheet. The consent forms and participant information sheets are provided in Appendix 3.

The participants (women or health professionals) were given at least two weeks after receiving the information sheet to consider whether they wished to participate, before signing the consent form. This strategy was designed to give sufficient time for the participants to discuss the issue with family, friends, colleagues or their midwife. During this time further opportunities for asking questions about the study were provided to women in group time, and to health professionals during the project officers' visits to maternity units. Further detail about this process is provided in Section 5.4.2). The project officers (myself included) purposely did not take on role of facilitator, even temporarily,

but maintained a 'researcher persona', in an effort not to influence the women's decisions about participating in the study.

In terms of the benefits to the community from the study intervention, it was considered important that the new model of care was acceptable to women during pregnancy. The potential benefits to the participants of the intervention were that they had an opportunity to focus on healthy eating and physical activity, both of which have been shown to be advantageous during pregnancy. Weight however, is a very sensitive issue, closely aligned to self-esteem and feelings of worth (Buckroyd & Rother 2007). Steptoe et al (1998) demonstrated that in some vulnerable individuals, stress leads to increased distress which stimulates alteration in food choice towards a greater intake of fat and sugar. There was a risk in this study that asking women to focus on their weight gain might induce anxiety or negatively affect self-esteem, and in some women, increase the likelihood of poor food choices or binge eating. It was planned that any women who consented to participate in the research would be offered an alternative model of hospital care or other appropriate referral during the research process if the need arose, but these precautions proved to be unnecessary.

Confidentiality was maintained by using pseudonyms for the participants and locations in the study. Privacy was provided by using settings for interviews and focus groups that were acceptable to the participants and where they were unlikely to be interrupted or overheard. The participants were informed when the data recorder was being used, which was especially important in the case of telephone interviews when the recording equipment could not be seen. Data were contained in a locked filing cabinet and will be held for a seven year period, stored separately from information identifying the research participants.

The next section describes the design of the realist evaluation and provides detail of the methods used in the study.



## 5.4 Study Design

The realist methodology was described in detail in Chapter 3. A comparison between the realist evaluation process and the classic ‘research cycle’ is shown in Table 7 to emphasise the essential design similarities and differences between the two.

**Table 7: Stages of the realist evaluation cycle**

STAGE	Research cycle	Realist evaluation process
Stage One	Theory and Hypotheses	Development of context-mechanism-outcome configurations
Stage Two	Identification of appropriate data sources	Identification of appropriate data sources (normally mixed method)
Stage Three	Data collection	Data collection
Stage Four	Data Analysis	Testing of the conjectured CMOCs, and synthesis of quantitative and qualitative data
Stage Five	Results	Revising understanding of configurations. Theory refinement and generation.

Adapted from Clarke (1999) and Pawson and Tilley (2004).

In accordance with Pawson and Tilley’s framework (Pawson & Tilley 1997), the research methods in my study were closely aligned with the realist evaluation methodology . This section describes how the research methods at Stage One, Two, Three and Four were undertaken. Stage Five is described in the Findings (Chapter 6) and Generation of Theory (Chapter 7) chapters of this thesis.

### 5.4.1 Stage One - development of context-mechanism-outcome configurations

#### Preparing for a realist evaluation: developing the initial hypotheses

As discussed in Chapter 3, the aim of realist evaluation is to produce a tested theory about what works for whom and in which circumstances to bring about behaviour change (Pawson & Tilley 1997). Crucially, the intervention must be based on theory at the outset, forming hypotheses that can be tested during the research process. Context-mechanism-

outcome (CMO) configurations are conceptual models, or initial hypotheses, of what will make the intervention work, representing the conjectured relationships between context, mechanism and outcome. In this case the middle range theory underpinning the intervention was that of self-efficacy. As discussed in the previous chapter, the intervention was based on the belief that increasing the confidence in both the women's and the health professionals' ability (self-efficacy) to change their behaviour, or practice, was the key to success of the intervention.

My study involved the evaluation of an intervention with challenging goals necessitating a complex interplay of strategies (mechanisms) for change. Many of these strategies had not been previously tested in a maternity context; supporting women to achieve lifestyle change in terms of eating and exercising through group antenatal care, and introducing a new way of working for healthcare professionals that impacted on the service as a whole, such as the development of outreach services. During the design phase of the intervention many potential or plausible CMO configurations were developed in conjunction with stakeholders, as strategies to increase self-efficacy were gradually selected and put in place. Individual examples of context, mechanisms and outcomes in this study are provided below.

**'Context' (C)** describes those features that existed locally when the intervention was introduced; geographical, social, cultural, professional and organisational. Published research that provided evidence for behaviour change in terms of weight management is also relevant to determining the existing context. Examples of these contextual features in relation to my study are shown in Table 8.

**Table 8: Examples of local and evidence-based contextual (C) features**

Contextual Features – published evidence (Chapter 2)	Contextual Features – local
Approximately 50% of women gain excess weight during pregnancy	Lack of specific antenatal services for obese pregnant women at either location
Excessive weight gain in pregnancy increases the risk for adverse perinatal outcomes	Local audits supported development of an appropriate intervention for obese pregnant women
In a published trial of group antenatal care in Sydney, Australia, midwives had initial misgivings about their abilities but gained confidence with support	Existing experience/lack of experience with facilitating group antenatal care
Clinicians lack confidence to discuss weight and weight gain talk to women	Local Management and clinical support to develop a model of care for obese pregnant women
Pregnant women want consistent guidance in relation to healthy lifestyle	No Australian clinical practice guidelines in relation to gestation weight gain were available at the time of the implementation of the intervention

A clear understanding of context is crucial in complex interventions, because it provides a clue to the factors that may act as potential constraints or enablers, and largely determines the choice of strategies that are deliberately introduced to bring about change.

**‘Mechanism’ (M)** refers to those systems or strategies that bring about change. These may be visible or invisible, intended or unintended. When developing the initial hypotheses these strategies are usually visible and intended, but whether change actually occurs will depend on whether participants choose to engage with them. Pawson and Tilley (2004) maintain that during the realist evaluation process further mechanisms come to light that were not immediately obvious or intended. Examples of visible and intended mechanisms (M) that were initially selected for the intervention, and the target group they were intended for, are shown in Table 9.

**Table 9: Examples of intended mechanisms (M) and target groups**

Intended Mechanism	Target Group
Peer support through collaborative group antenatal care to increase self	Women and health professionals
Provide care in a community venue to highlight normality of weight management	Women
Training in Motivational Interviewing, a communication tool designed to initiate behaviour change	Health professionals
Goal setting using a structured tool	Women
Development of written materials to assist in facilitating group care	Health professionals
Communication Strategy to raise local awareness of the intervention	Health professionals, managers and consumers
Hand held notes to promote engagement, encourage accountability and maximise safety for women through information sharing	Women

**‘Outcome’ (O)** as described by Pawson and Tilley (2004) are patterns, comprising the intended and unintended consequences of intervention resulting from the activation of multiple mechanisms in different contexts. The CMO configurations identify the means by which the planned outcomes will occur. Examples of intended outcomes (O) and the target groups are shown in Table 10.

**Table 10: Examples of intended outcomes (O) and target groups**

Intended Outcome	Target Group
Develop a sustainable model of antenatal care for obese women that is acceptable to both women and health professionals	Women and health professionals
Increased confidence in ability manage weight gain during pregnancy	Women
Increased confidence and competence to discuss weight and weight gain with pregnant women who are obese	Health professionals
Confidence to promote behaviour change through group facilitation	Health professionals
Perception of increased support through group care attendance	Women

In line with the realist framework, initial hypotheses, in the form of ten CMO configurations, were developed from these individual aspects to identify pathways that were designed to bring about change (Table 11). The detailed configurations are presented in the Conjectured CMO Realist Hypothesis Grid in Appendix 4.

**Table 11: CMO configurations developed for this study**

CMO	CMO Name
CMO 1	Service provision
CMO 2	Group attendance
CMO 3	Acceptability (health professionals)
CMO 4	Acceptability (women)
CMO 5	Weight gain
CMO 6	Information
CMO 7	Support
CMO 8	Confidence (women)
CMO 9	Confidence (health professionals)
CMO 10	Relationship

The configurations were later used during the data collection process to develop the questions for the focus groups and individual interviews of both the women and the staff involved in the implementation of the intervention, in order to test the initial hypotheses.

## **5.4.2 Stage Two - identification of data sources**

A number of quantitative and qualitative data sources were identified for the purpose of obtaining the variety of data necessary to help answer the 'how', 'why' and 'for whom' questions about the intervention outcomes (Wand, White & Patching 2010a). Table 12 provides an overview of the data selected for this purpose.

**Table 12: Forms of data collected for my study and their origin**

Type of data	Form of Data	Data collected for DoH evaluation	Additional data collected for my study	Data Incorporated into my study
<b>Qualitative</b>	Focus groups/interviews with women who participated in the intervention groups	No	Yes	Yes
	Focus groups/interviews with antenatal staff, group facilitators and other key stakeholders	Yes	Yes	Yes
<b>Quantitative</b>	Demographic details of all women who participated in the intervention	Yes	No	Yes
	Demographic data of all health professionals who participated in interview/focus groups	No	Yes	Yes
	Clinical outcome data from ObstetriX <sup>10</sup> /clinical records: women who participated in the intervention	Yes	No	Selected only
	Records of group attendance for women who participated in the intervention	Yes	No	Yes

The recruitment of the participants and the majority of the data collection were undertaken only ten months after the implementation of the first groups on both sites. This decision was influenced by the budget and timescale specified in the original funding agreement with the former NSW Department of Health (DoH). These ten months took place between March and December 2010 and are described as the ‘study period’.

### **Qualitative data - participant selection**

The range of information required meant that a large number and variety of stakeholders were required to participate during the data collection phase. Four groups of participants

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<sup>10</sup> Midwives’ database software program used to collect antenatal, birth and immediate postnatal outcomes on births in NSW

were recruited for participation during the study period; women who attended the intervention, midwives and midwifery students who offered the intervention to pregnant obese women in the antenatal clinics, health professionals (midwives, dietitians and physiotherapists) who facilitated the intervention, and other key stakeholders such as managers and medical personnel who directly or indirectly influenced the implementation of the intervention. Table 13 provides an overview of the study participants at each location.

**Table 13: Study participants at each location**

Participants	Number of individuals	
	Location A	Location B
<b><u>Women</u></b>		
Intervention participants	10	10
<b><u>Antenatal clinic staff:</u></b>		
Midwives	8	7
Student midwives	3	0
<b><u>Group facilitators:</u></b>		
Midwives	2	3
Dietitians	1	1
Physiotherapists	1	0
<b><u>Other key stakeholders:</u></b>		
Service Managers	4	2
Obstetricians	1	2
Ward clerk	0	1
<b>Number of participants</b>	<b>30</b>	<b>26</b>
<b>Total</b>	<b>56</b>	

The 20 women interviewed for the study represented 50% of the women who had attended the intervention groups, given birth, and attended a postnatal reunion group during the study period (by December 2010). It is difficult to identify a denominator for the antenatal clinic staff; over the 10 month period many midwives would have offered the intervention, including core staff, caseload staff and those allocated to the antenatal clinic for a short period of time. The number who eventually took part in the focus groups

was opportunistically determined by availability. Due to the small numbers involved, I was able to interview 100% of the group facilitators and the majority of relevant service managers at each location.

## **Women**

The study inclusion criteria for the pregnant women were: a BMI  $\geq 30\text{kg/m}^2$ , a singleton pregnancy and the absence of Type 1 diabetes. The funding agreement with the NSW Department of Health specified that women attending the intervention would be obese (BMI  $\geq 30\text{kg/m}^2$ ). The remaining criteria were selected because the recommended gestational weight gain for multiple pregnancy is insufficiently researched, and women with Type 1 diabetes require specific dietary advice.

The women who met the criteria were offered the intervention by a midwife at their booking visit in one of the hospital antenatal clinics at either Location A or B. Over the first 12 months of the study, a total of 232 women across both sites were offered the intervention and 81 (35%) subsequently agreed to attend one of the antenatal groups that constituted the intervention.

All women attending the intervention groups were informed of the evaluation process by the project officers at each site (including myself at Location A) at their first group appointment. Information sheets were provided, explaining that clinical data would be collected from the ObstetriX database and from the woman's clinical record as part of the evaluation of the intervention if consent was provided. Consent forms were distributed and the women were asked to return these at their next group visit. Only two women declined consent.

Specifically for my PhD study (the realist evaluation), women who had consented to their birth outcome data being collected for the evaluation were further invited to participate in a focus group or interview. Initially I had intended to select women for interview using a



purposive sampling technique, in order to select the more information-rich or atypical cases of particular interest (Burns & Grove 2005). However, it became clear that because of the rather chaotic nature of women's lives during the first eight weeks after the birth, I would be restricting the number of interviews unnecessarily by this method. Eventually every woman who had attended an intervention group was invited for interview, either face to face at a postnatal reunion or by telephone. During the study period 20 women (10 at each site) consented and participated in an interview or focus group within eight weeks of the birth of their baby.

### **Antenatal Clinic Staff**

Antenatal clinic staff who offered the intervention to obese pregnant women at the booking visit were invited to attend focus groups. A total of 15 midwives and three midwifery students subsequently attended five focus groups in antenatal clinics across both Location A and B.

Recruitment was undertaken by means of email and paper advertisements targeted to all staff involved in recruitment of women to the intervention, two to three weeks in advance of each focus group. Information was also displayed at specific locations within the hospitals, such as the antenatal clinics. Antenatal clinic managers were contacted individually in order to request a convenient time that would achieve the highest staff attendance rate. I also visited the ward areas some hours prior to the focus group as a reminder of the event. Consent forms were signed by attendees prior to the start of the focus groups.

Due to time and workload restraints only one focus group was offered at each hospital site. I had anticipated some reluctance from staff to participate but was surprised at the enthusiastic response from most of the participants. At one of the hospitals in Location A an additional focus group was eventually conducted on the labour ward as two midwives who wished to participate were unable to leave the ward area due to workload.

### **Group Facilitators**

The facilitators of the intervention groups included midwives, dietitians and physiotherapists. These members of staff were contacted individually by telephone and invited to attend separate focus groups from those attended by the antenatal clinical staff, one at each location. A total of eight members of staff (five midwives, one physiotherapist and two dietitians) participated in a focus group at either Location A or B. Consent forms and information sheets were provided prior to the focus group.

### **Other key stakeholders**

Service managers responsible for staff working within the intervention groups, and medical staff who provided antenatal care to women attending the groups were invited by email or telephone to interview, and information sheets were provided. Consent forms were signed prior to interview.

## **Quantitative Data**

### **Demographic and outcome data**

Quantitative data in the form of demographic details for women and for health professionals and selected birth outcomes for women were collected from those participants identified in Table 13.

## **5.4.3 Stage Three – data collection**

### **Qualitative data collection**

Each interview or focus group was structured to enable data to be collected for both the Department of Health evaluation outcomes report and the realist evaluation study. The data collected for the Department of Health evaluation will not be described. All interviews and focus groups were recorded with permission for later transcription. The transcriptions of the health professionals' focus groups and interviews with managers and

doctors were undertaken by various members of the steering committee, including me. The transcriptions of the women's interviews were undertaken by me.

### **The realist interview process**

My study involved interviewing participants using the realist interview technique, described in Chapter 3. Each participant had been provided previously with information about the evaluation process, and at the beginning of each interview I briefly outlined what the intervention had attempted to achieve, and the key changes that had been introduced.

The initial or 'conjectured' CMO configurations provided structure for the interviews. I commenced the interview by asking whether the relevant planned outcomes had occurred, and if any unplanned outcomes had arisen. As the participants had been engaged in a group intervention they were in a good position to know what had worked and why from their own perspective, and also from observing others. The interview then focused on developing a shared understanding about why these outcomes had or had not been achieved, from the participant's point of view. I also asked questions about the choices made by those involved in the intervention, acceptability of new systems, and the conditions necessary to sustain behaviour or practice change.

This form of interview had several advantages when talking to women about weight management, because of the sensitive and personal nature of the issue. Firstly it was objective (it was about aspects of the intervention not about the woman herself), secondly it was respectful (open about the purpose and seeking opinion from an expert), and thirdly it made the participant a valuable partner in the data generation process. A sample of the interview questions can be seen in Appendix 5.

### **The choice between focus groups and individual interviews**

Both focus groups and individual interviews were used to collect data in relation to the views and experiences of the stakeholders. The purpose of both methods is outlined below.

Focus groups, like individual interviews, have the ability to both explore and explain topics as well as testing, refining and evaluating propositions (Minichiello, Aroni & Hays 2008). An important advantage of face to face interviews is that there is more time to explore the topics in detail than in focus groups, and that participants may be more likely to express their individual views; an important consideration for the realist interview technique. By contrast, focus groups have the ability to generate original material created through the engagement of the participants (Morrison & Peoples 1999), and to provide access to verbal and non-verbal group interactions that may offer further insight to the topic.

The realist interview technique questions why particular outcomes had occurred for some and not others. Kitzinger (2005) states that focus groups have the potential to examine not only what people think, but also why they think it. In this context, focus groups in my study provided the opportunity to examine consensus or variation of opinion (Krueger & Casey 2000) and were especially valuable in building explanations for intervention outcomes.

The subject matter also has an important bearing on the chosen method of data collection. There were for example, important considerations in terms of women (and health professionals) who might have felt vulnerable because of their weight. I was aware of the need for the participants' privacy but also aware of evidence to suggest that individuals feel less pressure to respond (Cluett & Bluff 2006) and a sense of 'safety in numbers' (Burns & Grove 2005 p.542) within a focus group. On the other hand, I was concerned that 'groupthink' (Minichiello, Aroni & Hays 2008, p. 151) might occur where participants would be swayed by what others thought, or not feel comfortable to voice

their true thoughts. To mitigate these concerns, all focus group participants were offered the opportunity of an additional individual interview. One woman took up this offer.

The choice between the two methods was eventually a combination of participant request, scheduling issues or geographic limitations. These are discussed below in relation to each stakeholder group.

### **Interviews and focus groups with women**

In total, 20 women were interviewed, either individually or as part of a group, ten at each location. One of these women was interviewed twice as she first participated in a focus group and then requested an individual interview. All interviews and focus groups took place within eight weeks of the women's births.

It was originally intended that the interviews with the women who had participated in the intervention would take place individually, face to face, at a venue of their choice (such as the community clinic with which they were familiar, or in their own home). In the event, only three individual face to face interviews took place at Location A, and all the interviews at Location B were carried out individually by telephone. I was present at each postnatal group at Location A in order to consent women for interview and often after a preliminary explanation about the purpose of the interview, women requested to be 'interviewed' as a group or with another group participant. Kitzinger (2005, p. 57) suggests the use of 'interaction between participants to generate data and [then] giving attention to the interaction as part of the analysis', is a defining feature of focus groups. One of the aims of the intervention was to generate peer support for weight management, and it was interesting to see the women support each other to debate very personal topics.

Three focus groups eventually took place at Location A, involving between two and four participants, lasting between 45 minutes and one hour. Due to the distraction of the babies who were also present, these group discussions were rather disjointed, but

provided rich data owing to their relaxed and 'open' discussions. The women also obviously enjoyed the experience; the words were often very difficult to transcribe due to the amount of laughter. As Minichiello et al. (2008) point out, there are limiting factors to focus groups such as the fact that the interviewer has less control than in individual interviews.

Although I had not planned focus groups with the women I felt that the interactions between the participants in these groups would offer valuable data to my study. In terms of the specific nature of the questions I needed to ask, the individual interviews provided more specific data, but the focus groups provided an alternative insight to the 'hidden' mechanisms functioning within the groups.

Due to distance, I initially 'trialled' telephone interviews with the women from Location B. These were very successful in terms of convenience for the woman, and in the quality of the data obtained. Telephone interviews are notoriously unsuccessful when 'cold called' (Cluett & Bluff 2006). To overcome this potential difficulty, I took care to make a pre-arranged time for the interviews, usually when the women had someone else at home who could care for the baby. The data was surprisingly rich via this method, suggesting that the anonymity of the call was probably useful for the women, especially as much of the call involved questions about the woman's ability to engage with weight management strategies offered through the intervention. Although non-verbal cues could not be obtained throughout the call, this did not seem to affect the flow of the conversation or limit the women's responses. Nine telephone interviews were conducted in this way, lasting between 30 minutes and 75 minutes, using a speaker phone and a data recorder.

### **Focus groups of midwives and students working in the antenatal clinic**

Focus groups of midwives and midwifery students working in the antenatal clinics were conducted during November and December 2010, approximately ten months after recruitment to the groups had commenced. The role of the midwives and students was to

make the offer of the intervention individually to women during the booking interview, so the focus groups were often the first time they had had an opportunity to share their experiences with their colleagues. Some participants in the groups were obviously more confident than others in talking to obese women about their weight, and several commented that participating in the focus group had been a useful learning experience.

Three groups were conducted at Location A and two at B, in both 'low risk' and 'high risk' antenatal clinics. The focus groups were conducted in quiet environments at the various maternity units, such as a meeting room. The groups lasted between 45 minutes and an hour and a half, and consisted of between two and five participants and myself. In total, 15 midwives and three midwifery students were interviewed in focus groups across both locations.

#### **Focus groups of facilitators**

Focus groups of staff who facilitated the intervention groups at both locations were carried out at the end of the study period. Focus groups were deliberately organised for data collection with these staff. A very positive working relationship between the facilitators was evident at both locations and I hoped to explore this during the focus groups.

One focus group of facilitators was carried out at each location. The dates for the focus groups were agreed with the participants a month before the events and permission was sought for these to take place during clinical time to ensure attendance. The groups were held in the community centres where the intervention groups were situated, and lasted over one and a half hours each.

#### **Interviews with other key stakeholders**

Face to face individual interviews were conducted with other key stakeholders, mainly due to the variety of their work roles. At Location A, an antenatal clinic manager from

each hospital, a physiotherapy manager, a dietetic manager and the 'named' obstetrician for the intervention groups were interviewed. At Location B, two antenatal clinic managers, an antenatal clinic clerk and two obstetricians working in the 'high risk' clinic were interviewed. The interviews last from 10 to 20 minutes each and were recorded for later transcription.

## **Quantitative data collection**

### **Demographic and selected outcome data**

A range of quantitative data was collected from woman and health professionals who consented to participate in the evaluation of the intervention.

#### **The women**

Demographic data were collected from the woman's hospital notes; age, obesity class, parity, and location of group (A or B) were recorded by the midwives who facilitated the groups. Post-birth outcome data; weight change, mode of birth and number of groups sessions attended; were collected and recorded either by myself, as project officer at Location A, or by the project officer at Location B, either directly from the woman's notes, or from the electronic 'ObstetriX' data set.

A summary of the women's demographic and selected birth outcome data are presented in Table 14 in Chapter 6, and the full details in Appendix 7.

#### **The health professionals**

Demographic data were collected for the antenatal clinic midwifery staff and students at the time of interviews and focus groups; age, years since midwifery registration, area of practice, location of intervention (A or B), and whether the individual had attended the initial training sessions provided. A summary of the demographic characteristics of the



midwifery staff and students are presented in Table 16 in Chapter 6, and full details in Appendix 7.

Due to the small numbers of facilitators and other key stakeholders, and the variety of professional roles, only the location of their work (Location A or B) and professional group/occupation was collected for these individuals. These data are presented in Table 18 and 20 in Chapter 6, and full details in Appendix 7.

#### **5.4.4 Stage Four - data analysis**

Realist evaluation methodology suggests there are no rules in terms of data analysis, the only stipulation being that the method chosen should adequately test the hypothesis (Mackenzie et al. 2009). Maxwell and Miller (Maxwell & Miller 2012) describe the process of applying a realist perspective to data analysis. This involves utilising a variety of strategies to search the data for similarities and differences (which they term 'categorising' strategies) and find connections (which they term 'connecting' strategies).

#### **Categorising and connecting the data**

Maxwell and Miller argue that the distinction between categorising and connecting strategies is particularly important for obtaining local causal conclusions from the data. These authors caution that categorising strategies such as coding depends on splitting up and reorganising the data, which in turn risks fragmenting the causal processes, allowing only generic statements of causal relationships among categories. In order to manage this risk, Maxwell (2012, p. 44) recommends that 'links' are maintained in the data in order to retain a holistic perspective. The first step however, is to integrate the qualitative and quantitative data.

#### **Data integration**

Data integration is the process in which qualitative and quantitative data is combined in mixed method research. Bazeley (2010, p. 432) describes integration as the process by

which different data elements are combined to produce findings that are greater than the sum of their parts. Integration during analysis, rather than as a conclusion to analysis, is the focus of a number of mixed method theorists who have identified design strategies in recent years (Creswell & Plano Clark 2011; Teddlie & Tashakkori 2009; Yin 2006). Bazeley describes how the availability of qualitative data analysis (QDA) software has provided specific capacity for integrative mixed method analysis, making available a large number of new integrative strategies.

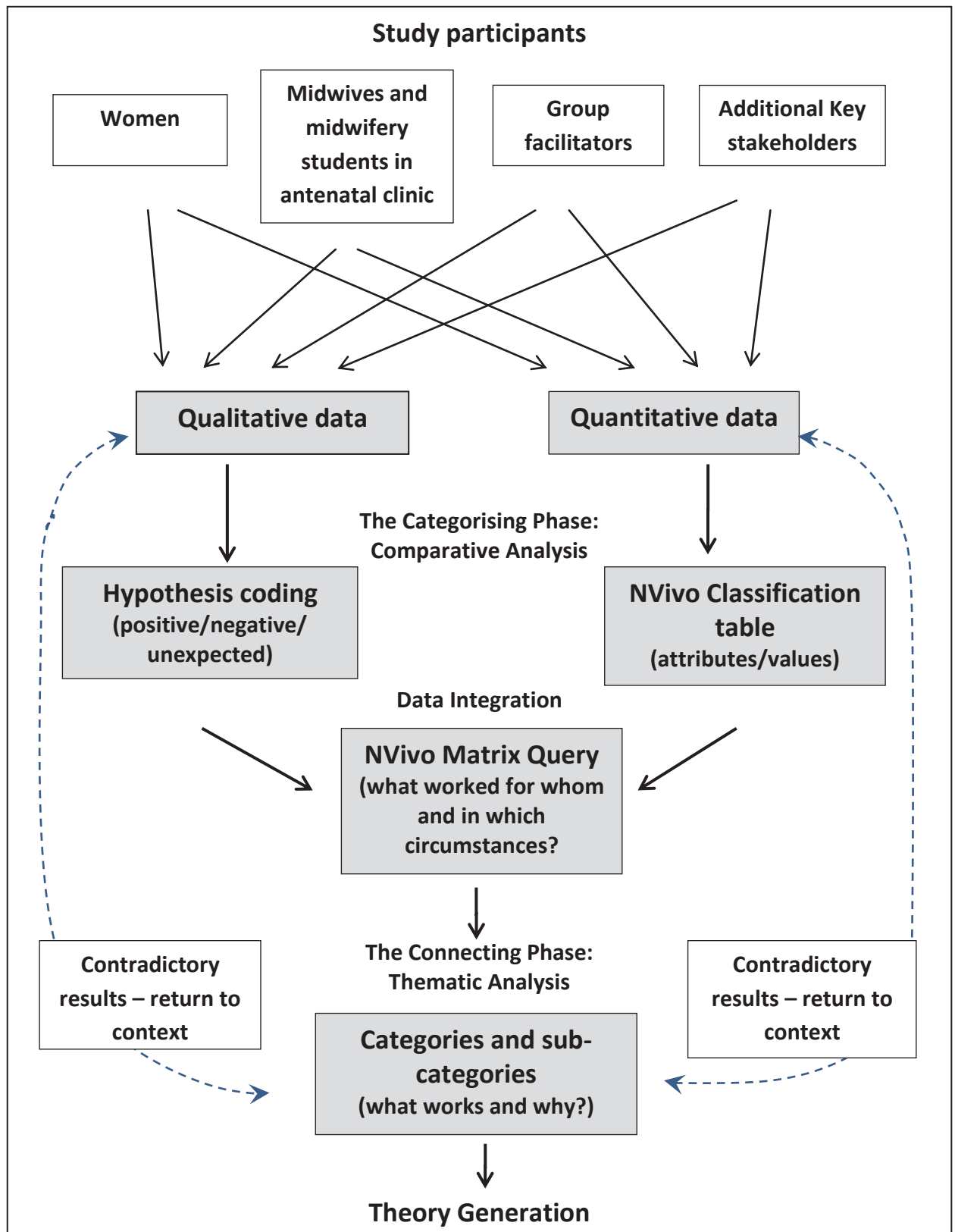
To this end, I developed an analysis framework to integrate the different forms of data in my study using the NVIVO QDA software, by categorising and then re-connecting the whole. The availability of QDA software has both positive and negative implications for the data analysis process (Bazeley 2013). On one hand it can retrieve, sort and interrogate data in ways that are not possible with pen and paper, but on the other it can lead novices to make mistakes without realising they have done so (Gilbert 2002), which in turn risks the reliability and trustworthiness of the data. In order to mitigate these risks I was conscious that the QDA software was a tool to support, not to substitute, the analysis process. The process, including the strategies I employed to ensure the trustworthiness of the findings is described in the following section and further expanded throughout the remainder of this chapter.

## **The analysis framework**

The purpose of a realist evaluation is to compare reality with predicted outcomes. In keeping with the realist perspective described by Maxwell, I analysed the data using a two-phase sequential process in order to build explanations for what works for whom, and in which circumstances. This process entailed firstly, a comparative analysis (as a 'categorising' and data integration strategy), and secondly, a thematic analysis (as a 'connecting' strategy). Whilst I used the data management and querying capacity of the NVivo program, I constantly reviewed coded segments within the larger context, reviewing the data as a whole through the final thematic analysis. This process enabled

me to audit my own thought processes and develop confidence in the reliability and trustworthiness of my findings. A diagrammatical representation of the analysis framework can be seen in Figure 1.

Figure 1: The analysis framework of the study



## **Phase 1 – Comparative analysis**

The first phase of the analysis focused on coding and categorising the qualitative data in relation to the outcomes of the intervention, and integrating this with quantitative (variable) data in a series of matrices using NVivo.

### **Coding the qualitative data**

As an initial step, the qualitative data obtained through interview and focus groups was coded using a pre-determined list of codes designed to test the researcher-generated hypotheses (Bernard 2006). This form of coding is known as ‘Hypothesis Coding’ (Saldana 2009). The codes are developed by the researcher from predictions about what will be found in the data before collection or analysis. Hypothesis coding is a good fit with the realist interview technique where participants are specifically asked whether or not the outcomes occurred in the way they were planned.

Saldana states that hypothesis coding is applicable to various research designs, such as an analysis of qualitative data for evaluation research (Patton 2002), or any design where a search for rules, causes and explanations are sought and where narrowly defined parameters of investigation are required. The hypothesis-coded data can subsequently be integrated with quantitative data in mixed method research (Creswell & Plano Clark 2011).

For my study, where I wished to test the CMO hypotheses, in terms of what worked for whom and in which circumstances, hypothesis coding was particularly relevant. The codes were developed directly from the CMO hypotheses and applied to the data during the analysis process. Three codes were created for the participants’ responses to questions about the outcomes of the intervention:

- **Positive:** ‘yes, that worked for me’
- **Negative:** ‘no, that didn't work for me’
- **Unexpected:** unexpected responses that did not feature in the hypotheses

Saldana (2009) suggests that qualitative data analysis (QDA) software is well suited for hypothesis coding as the codes can be entered at the outset and then the various query and search functions can help investigate relationships and patterns within the data. The advantages of using QDA software is that a range of factors in the same passage of text can be coded, reviewed, sorted, combined and compared across the data (Bazeley 2010). For this reason I used NVivo for this phase of the analysis process.

### **Creating data sets in NVivo**

The next step was to create data sets based on the demographics (and birth outcome data where applicable) of each participant. For analysis purposes, where the range of a characteristic was wide (for example age, age, BMI and weight change), categories were developed (for example age ranges <25, 25-30 or >30 years) in order to condense the data and enable comparisons across the sample. These categories are treated as 'attributes' and 'value' ranges in NVivo. Examples of attributes, or variables, for the women who participated in the intervention were parity and BMI, further divided into value ranges; parity 0,1 2 3 and BMI obesity class I, II, or III.

### **Data integration**

Using 'query' procedures in the NVivo software program, integration of the quantitative (demographic and birth outcome) data with the hypothesis-coded qualitative data was subsequently possible by creating a cross tabulation in the form of a matrix. Matrices, or joint displays (Creswell & Plano Clark 2011), allow comparison of categorical data through visual display of similarities and differences in the cells of the table. In qualitative work, matrix displays can reduce information from complex field notes and interviews into a visual display that helps make evident any patterns in the data (Creswell & Plano Clark 2011). Bazely (2013) warns however, that care must be taken not to over-count the codes when creating a matrix with data generated through qualitative methods. This possibility can be avoided through storing the interviews within the QDA software in the form of an audit trail, which can be easily checked.

Through the process of creating these visual displays, the pattern of relationships between the coded categories and the attribute data in the matrix for each element of the CMO hypotheses was then possible, providing an analysis of 'what worked for whom'. Increased confidence to talk to women about weight gain for example, was more likely to be an outcome for midwives under 30 years, than those over 45 years of age. This example is displayed in a matrix in Appendix 6. Even though the numbers of participants in some of the data sets were small, this step revealed that different groups of participants described their experience of the same event in very different ways. This comparative process helped to identify both patterns and exceptions in the data that were explored further in the second phase of the analysis.

## **Phase 2 – Thematic Analysis**

In order to explain why the planned outcomes occurred in some circumstances and not others, the second phase of the analysis explored relationships between the codes and the context of the data. Maxwell describes this phase as preserving links in the data and identifying connections between events and causal processes. In terms of 'testing' of the CMO hypotheses, the purpose of this phase of the realist analysis was to identify the mechanisms that were active in some circumstances and not in others. Mechanisms describe how the intervention works beneath the surface and therefore identification is key to a realistic evaluation (Byng, Norman & Redfern 2005). To do this, a process of thematic analysis (Patton 2002) was undertaken, using the hypothesis-coded data as a starting point.

During the process of thematic analysis, the codes were read and re-read in the context of the data in order to identify similarities and differences in the participants' experiences of the events. Themes with sub-themes containing a combination of 'Positive', 'Negative' and 'Unexpected' codes were subsequently identified. These themes identified both tangible and intangible mechanisms that enabled (or prevented) the outcomes to occur.

The second phase of the analysis therefore attempted to create connections in terms of causal relationships by examining the coded data in the context of participants' circumstances and experiences.

### **Confirmatory and contradictory results**

The purpose of the analysis was to offer both supporting and non-supporting evidence for theory. Yin describes 'converging lines of enquiry' (Yin 2009, p. 115), or confirmatory evidence, which supports convincing conclusions. In comparison, divergence and contradictory results suggest 'negative cases' (Centre for Epidemiology and Research 2011).

The realist evaluation approach places specific emphasis on contradictory results and unintended negative consequences (Mackenzie et al. 2009). Contradictory results were at times identified in my analysis, at which point I returned to the context (Figure 1) to examine differences and similarities that might account for these contradictions. Comparing findings across Location A and B helped to determine how and whether the same mechanisms worked in different contexts to produce different outcomes.

Pawson (2002) states that both positive and negative CMO configurations are both are equally important, as the negative configurations may provide vital clues, such as the wrong individual in the wrong environment, for whom the intervention makes no difference. As sub-categories (previously hidden mechanisms and unplanned outcomes) arose from the data, these were added to new prototype CMO configurations, building explanations around causality.

## **5.5 Chapter summary**

This chapter has described how considerations of sensitivity and dignity directed the research activities and how ethical approval was successfully obtained for the study. My role within the research process has been explained, and strategies employed to manage



the potential for conflict and bias have been explored. The overall design of the realist evaluation study has been examined in terms of a mixed method approach and the use of comparative data. Detail has been provided about the recruitment of the participants, the methods of data collection and the phased data analysis process. The next chapters will present Stage Five of the research design; the findings of the study, the refined CMO configurations, and the generation of appropriate middle range theory.

# CHAPTER 6 - FINDINGS

## Introduction

This chapter presents the findings of my study. In order to highlight what worked for whom and in which circumstances the quantitative and qualitative data were analysed in two phases and then integrated as described in Chapter 5. There are four sections within this chapter, based on the analysis of data from the stakeholder groups:

**Section A** - women who participated in the intervention

**Section B** - midwives and midwifery students who offered the intervention to pregnant obese women in the antenatal clinics

**Section C** - midwives and allied health staff who facilitated the groups

**Section D** - additional key stakeholders such as service managers and obstetric staff.

Within each section the findings are compared to the conjectured CMOs, and presented under the following headings:

## Contextual factors

The context influenced the way the participants experienced the mechanisms and therefore the outcomes. The context related to the participants' past experiences and current situation, (either from an organisational or an individual perspective), and their motivation to participate in the intervention.

## Outcomes

An understanding of 'what worked for whom' was gained through a process of comparative analysis, combining the hypothesis-coded qualitative data with the demographic details of the participants in the form of NVivo matrices. Both planned and

unexpected outcomes of the intervention are presented in relation to the original hypotheses.

## **Mechanisms**

An understanding of why the planned outcomes occurred in some circumstances and not others was gained through a process of thematic analysis, exploring relationships and patterns in the data. Identifying the mechanisms or influences acting as 'active ingredients' for change, is key to any realist evaluation as the outcomes are ultimately dependent on the mechanisms.

A table is provided at the end of each section summarising what worked for whom and in which circumstances, in order to build explanations in relation to causality.

## CHAPTER 6 – Findings section A

### 6.1 Women who participated in the intervention

Women from both Location A and B were invited to participate in interviews and focus groups within three months of the birth of their babies. The sample consisted of ten women from each location. Table 14 provides a summary of the demographic and selected birth outcome data for these 20 women. The women's data was de-identified and pseudonyms were used for each participant. A detailed table of the participants' individual characteristics, including their pseudonyms, is provided at Appendix 7.

**Table 14: Summary of the women's demographic characteristics and selected birth outcomes**

Characteristic	Number of women	Characteristic	Number of women
<b>Age (years)</b>	<b>n =</b>	<b>Parity</b>	<b>n =</b>
<25	2	0	10
25-30	11	1	9
>30	7	2+	1
<b>Obesity Class*</b>	<b>n =</b>	<b>Mode of Birth#</b>	<b>n =</b>
I	9	Normal	9
II	6	For/Vac	3
III	5	CS	8
<b>Location</b>	<b>n =</b>	<b>Groups attended (n)+</b>	<b>n =</b>
A	10	4	4
B	10	5	3
<b>Weight Change^</b>	<b>n =</b>	6	7
<5kg	8	7	6
5-9kg	6		
>9kg	6		

\*Obesity Class I = BMI>30-34.9kg/m<sup>2</sup>, Class II = BMI>35-39.9kg/m<sup>2</sup>, Class III = BMI>40kg/m<sup>2</sup>

^ Weight Change = 5kg = below, 5-9kg = within, or >9kg = above the IOM guidelines for gestational weight gain in obese women

#Mode of Birth = Normal = spontaneous vaginal birth, CS = Caesarean birth, For/vac = instrumental birth

+Groups attended = Maximum of 7 sessions

### 6.1.1 Contextual factors

The contextual factors identified in the initial hypotheses, or CMO configurations, suggested that women are motivated at the outset of pregnancy to attain and maintain a healthy lifestyle during pregnancy, but experience barriers such as inaccurate and inconsistent health messages, lack of support and poor confidence. Published studies also suggested that engaging pregnant women successfully in services focussed on weight gain during pregnancy is challenging. Factors associated with the local context in both locations are described below.

#### Past experiences and current situation

Women described their experience of the intervention in terms of their own participation, set in the context of their personal circumstances. All the women had been overweight for many years, although they were not necessarily aware of being in the 'obese' category. Many had tried to lose weight with varying success; Fran described her constant struggle with her weight: *'it's not a new thing; as a bigger woman you spend your whole life trying to lose weight and having to watch it all the time'*.

Five women at Location A and four at Location B revealed that they had previous or current mental health or eating disorder issues, and one had had a gastric banding<sup>11</sup> procedure after her previous pregnancy. Several experienced some form of abuse from their partners during pregnancy; two of the women subsequently left their partners soon after the birth of their babies. These details had not necessarily been disclosed to their care providers.

All the women described previous negative experiences in terms of their weight. These stemmed from physical discomfort and low self-esteem. The women described embarrassing comments overheard, or addressed directly to them from family, health

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<sup>11</sup> Gastric banding is a surgical procedure involving the laparoscopic placing of a silicone band around the upper portion of the stomach in order to reduce the size of the stomach and restrict the intake of food.

professionals and strangers for example. Nora had experienced progressive weight gain with each of her previous two pregnancies; she described how men *'look through me'* on the street, and most of time she just felt like a *'fat mum'*. She described how *'nothing about being overweight is positive, just uncomfortable..and it just gets worse in pregnancy'*.

None of the 20 women had participated in group antenatal care previously. Some had attended a *Weight Watchers* group for weight loss prior to pregnancy. Negative experiences in prior pregnancies coloured the women's feelings about antenatal care. For example, Mai talked about a midwife who berated her for being overweight: *'I used to come home from the midwife in tears, come home and have a Mars Bar'<sup>12</sup>*. Another woman, Gabi, described how she felt when an obstetrician warned her of the risks associated with being obese and pregnant: *'The doctor made me feel there was nothing I could do and all these bad things that could happen were my fault. I felt like a naughty girl to be pregnant'* (Gabi).

All the women maintained that limiting weight gain in pregnancy was a new concept; they had assumed a substantial weight gain was normal and inevitable. None of the multigravid women had been given information on the importance of weight gain in a past pregnancy; *'I asked and it was 'swooshed' [pushed] aside'* (Pip).

Women who chose to participate in the intervention did not necessarily tell their families they were doing so, or avoided questions about their antenatal care. In line with the conjectured contextual factors, opportunities for personal support were therefore limited. For example, Iona told her husband it was a parenting group because she had told him so many times things would be different with her weight: *'the people you love get sick of hearing the drama'*.

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<sup>12</sup> Chocolate bar known for high caloric content

## **Motivation to participate in the intervention**

The initial motivation to join an intervention group varied. Some women had a *'fear'* or *'horror'* of gaining a substantial amount of weight. Fran described gaining more weight as *'scary'* and Nora as *'terrifying'*. Lisa described the thought of another 20kg as a *'horror story'*. Myths and societal beliefs increased the fear of weight *'spiralling out of control'* (Fran). Health risks played a part in motivating women to join a group; the prospect of a caesarean section as a result of a high weight gain, a high blood pressure, previous gestational diabetes, and the risk of bleeding were all acknowledged as initial motivators. Multigravid women were more likely to relate their decision directly to previous pregnancy weight gain, wanting to focus on themselves, and to being *'older and wiser'* (Gabi). Women pregnant with their first baby agreed to participate because *'the midwife thought I should'* (Kim) or for the support that the group might provide.

Only one woman revealed that she joined the group for the health of her baby saying: *'I just wanted to do the right thing'* (Zara). Other women explained *'it was all about me'* (Lisa, Jenny) or *'I wanted to be a healthy mum'* (Uma). Kim was the youngest woman in the group (21 years) and managing her weight was about being able to buy *'hot'* clothes again and feel attractive.

### **6.1.2 Outcomes - or 'what worked for whom?'**

According to the conjectured CMOs, the planned outcomes for the women who participated in the intervention included:

#### **CMO 2 - Group attendance:**

- regular attendance at the groups (indicating satisfaction with care)

#### **CMO 5 – Weight Change:**

- weight gain within the IOM guidelines (5-9kg)

#### **CMO 6 – Information:**

- Report of accurate information in relation to healthy eating and activity

**CMO 7 – Support:**

- a perception of helpful support from peers and midwives via group antenatal care

**CMO 8 – Confidence (women):**

- a perception of increased self confidence in ability to achieve a healthy weight gain by making positive changes

During interviews and focus groups, women were asked to comment on these and any unexpected outcomes that had occurred as a result of the intervention.

**Group attendance**

All 20 women attended four or more sessions (a maximum of seven were provided). Earlier or later sessions were more likely to be missed due to late booking or birth of the baby. Not surprisingly, women who attended six sessions or more were more likely to report more positive feelings about group care during interview.

Of the 20 women interviewed, women at both locations who were older and having a second or subsequent baby were more likely than the younger and primiparous women to report that the philosophy of group care worked well for them. The opportunity to make new friends, have the benefit of space and time just for themselves, and receive comprehensive antenatal care free of charge were all perceived as benefits. Women who were older and multiparous were more likely to make a positive comment about the peer support that the group provided, whereas the 10 women having their first baby appeared to particularly appreciate having continuity of midwifery care. Women at Location B also made more positive comments in relation to peer support, possibly because these groups ‘gelled’ easily, being overall a more demographically homogenous group.

Primiparous younger women seemed less likely to equate the group model of care with successful weight management. Evie and Rae, the youngest participants, admitted that they came to the group ‘*to have a baby*’, not to manage their weight; Evie adding that it seemed strange to have to worry about her weight during her pregnancy when she never



had done so before pregnancy. Rae said she could not really '*be bothered*' to think about her weight when she wanted to think about the baby. Sasha suggested that as she was one of the '*smaller*' women in the group (she had a BMI of 30.1kg/m<sup>2</sup>) she felt many of the issues did not apply to her as she felt '*sort of thin*' compared to the other women. These views suggest a disconnect between personal and professional concern in relation to body weight, and suggest that younger women having their first baby may be a more difficult group to engage, especially if their weight is on the cusp of the obesity classification.

The initial recruitment process to the groups was variable, and the women's first contact in relation to the offer of care appeared to be key to subsequent experiences. The process of offering the group intervention was different in the two locations due to the hospital policies and organisational systems. For example, women booking at Location A did not receive any information about the option of group antenatal care until their initial booking appointment, and were booked by the 'next available' midwife or student midwife. This midwife or student did not necessarily have any expertise with group antenatal care and may or may not have supported it as an option. In comparison, at Location B the clinic clerk calculated the woman's BMI and recorded other information with every woman on the telephone prior to her first visit at the hospital. Women who were classified as obese were offered antenatal group care by the clinic clerk, and if they were interested they were directly referred for booking to the midwives facilitating the intervention groups. This system had the advantage of putting the women immediately in contact with experienced and specially trained midwives.

The process used to recruit the women to group antenatal care almost unanimously did not 'work' for the women at Location A; eight of the 10 women in the Location A sample noted that their initial contact was a negative one in relation to the way the midwives broached the subject of their weight. Initial negativity appeared to be associated with subsequent weight change. This finding is described in more detail in the sub-section below.

## **Weight change**

In the 20 women, weight change was fairly evenly distributed between those who gained within the recommendations (5-9kg), those who gained less (<5kg) and those who gained more (>9kg). Women who were younger and those whose weight was classified as Obesity Class I gained more than older and heavier women. The numbers of women in this sample were extremely small and conclusions cannot therefore be drawn about effectiveness. The weight change outcomes for a larger number of women who participated in the intervention during 2010-2011 have been previously published, demonstrating similar outcomes (Raymond, Foureur & Davies 2014).

Five women commented that they put on most of their weight prior to attending the first group at 20 weeks, because they were not aware of the recommendations. Having the appropriate information and support may have led to a different outcome if it had been provided earlier in pregnancy; the mechanisms (weighing regularly and having access to accurate advice) was popular, but the timing may have acted as a barrier to an optimum outcome.

An initial negative experience in relation to weight and weight gain from an antenatal provider appeared to set up difficulties that took time and effort to overcome, if at all. Women at Location A who gained excessive weight during pregnancy (>9kg) were more likely to have reported a negative experience when offered the group care option, or reported that they had been initially unwilling to participate in the groups. However, feeling positive about group care from the outset did not seem to affect weight change in this study; a similar number of women reported feeling positive about the group care in each weight change category. Satisfaction with group antenatal care may not therefore necessarily lead to successful weight management; additional factors are required for this to occur.

## Self-confidence and behaviour change

Increased self-efficacy (measured qualitatively) was expressed in terms of managing weight, for example Dale said, *'I have confidence I can manage it now, before I just thought I would put on heaps and there was nothing I could do'* (Dale). Some of the younger women commented that staying on track had become harder after the birth of the baby, without the support of the group. Increased confidence for some women was tempered by fear: fear of *'spiralling'*, of the *'slippery slope'* and of the importance of *'being OK about yourself in your head'* (having self-confidence) in order to continue. Facebook or social media support replaced face to face meetings for many of the women after the birth of their babies, indicating a continuing need for support.

In terms of increasing confidence to make positive changes, many women introduced small but significant changes into the way they managed their family meals and snacks, and were continuing to use the strategies and language of the group after the birth of their babies. Age and parity were related to behaviour changes; women who were over 30 years and multiparous described more forms of behaviour change in relation to themselves or their families. For example, Anna explained that her family would now accept six different vegetables, whereas previously they had only eaten frozen carrots. However, behaviour change did not seem to be related in a similar way with Obesity Class, in this very small sample, women with higher BMIs were no more likely to describe change than women with lower BMIs.

Unexpected outcomes in behaviour change occurred in relation to some women's children. Women described how their children were enjoying preparing food, eating a greater variety and being more involved in making their own healthier school lunches using star charts and points systems as incentives. One woman's daughter had experienced severe constipation for years which was now resolved by eating fruit snacks every day after school.

A second unexpected finding was an increase in the women's autonomy in relation to decision making, which extended to other areas of their lives, beyond weight management. Zara explained *'now I know what I'm talking about I feel OK about arguing [about healthy eating] with friends'*. Nora had the confidence to breastfeed her third baby: *'I'm breastfeeding this time because I know it's the right thing, last time I felt I sort of had to ask permission'*. Having a perception of greater autonomy, or control, in their lives allowed the women to justify their actions and make choices about spending more time with friends who were encouraging and positive and to 'make a stand' with in-laws.

One sobering example of the issue of confidence came from Zara who had her first baby and experienced an abusive relationship during her pregnancy. During her interview Zara spoke about the confidence the (normal) birth of her baby gave her: *'Being in control of my weight and having the baby so easily gave me confidence, like I was good at something after all'*. Soon after the birth Zara left her partner and spoke positively of her future.

The next section considers the mechanisms of the intervention; the intentional and unexpected strategies that helped or hindered women to manage their weight gain whilst participating in the intervention.

### **6.1.3 Mechanisms - or 'why did the outcomes occur in some circumstances and not others?'**

Mechanisms describe how the intervention works below the surface. The conjectured CMO configurations (Appendix 4) identified the planned strategies (mechanisms) for group antenatal care as (for example) continuity of midwifery care, the encouragement of 'women-led' session content, and the provision of time for informal networking. In terms of weight management, mechanisms included weight measurement at each session and the use of goal setting strategies.

Through a process of thematic analysis, two main categories were identified:

**1. Attending group antenatal care**

- **Feelings about care**
- **The power of the group**

**2. Staying on track**

**Attending group antenatal care**

The philosophy of group antenatal care was described in Chapter 4. Using group antenatal care for obese women specifically as a means of supporting weight management was untried at the time the intervention was introduced. In their interviews women described aspects of the group care philosophy in terms of their *Feelings about care* and the perceived *Power of the group*.

**Feelings about care**

Positive feelings about care included optimism, building positive relationships and feeling special, tempered in some cases by a perception of social exclusion and a reluctance to participate.

**Optimism versus reluctance**

Women described how they approached their first group visit with either optimism or reluctance. To a large extent this depended on the process by which they were offered the intervention, and this impacted on their subsequent experience of care. As described previously, the process of offering the group care was different in the two locations due to hospital policies and organisational systems.

The offer of the groups to women in Location A often resulted in reluctant agreement and sometimes offense, for example, one woman said: *'She was really abrupt, she said there was nothing I could do about it [her weight] now but because I was so fat I should come to the group. I only came because I felt I was at a dead end'* (Evie). The offer of the

intervention to some of the women felt punitive as Tara says: *'I didn't think I would like it – I only came because of the threat of not having my baby at xxx Hospital'*. In many cases, the women at Location A were subsequently unwilling to attend the group for care.

At Location B, women tended to respond with optimism to the benefits suggested by the midwives they initially spoke with. Fran commented *'It was good when the midwife said "this is what we can do to help you to manage your weight"...and I thought "Yes, that's great for me, I need that"'*. In addition, lighter women (those women in Obesity Class I) were more likely than heavier women (Class II or Class III) to report a negative experience when offered group antenatal care, perhaps because they did not personally identify as obese. The mean BMI of the women at location A was less ( $34.6 \text{ kg/m}^2$ ) than at Location B ( $38.2 \text{ kg/m}^2$ ), and dissatisfaction on this issue was more likely to be reported from women at Location A.

Much effort was spent 'repairing the damage' from the initial contact and engaging and motivating women at Location A to attend. All women with a BMI of  $\geq 30 \text{ kg/m}^2$  at Location A were followed up with a phone call after their booking visit by one of the specially trained midwifery group facilitators. This personal approach appears to have been a turning point: as Sasha explains *'she was so nice I didn't have the heart to turn her down. She said "just try it once and see what you think", and I never looked back'*. Overall, the numbers of women accepting the intervention at both locations was approximately the same, although considerable time and effort was expended at Location A to achieve these numbers. The rate of recruitment was 35% of the total number of women offered the intervention across both locations (Davis et al. 2012). Creating optimism at the initial contact with women who are vulnerable through their obesity appeared to be a critical mechanism to achieving the planned outcomes of the intervention.

### **Feeling special**

Once they joined an antenatal intervention group, many of the women at Location A talked about 'feeling special' in terms of taking part. This was a strategy (mechanism) deliberately used by the facilitators in Location A where recruitment to the intervention was difficult. The facilitators at Location A used the word 'special' in terms of the creation of the intervention: *'specially designed for overweight women'* which was very successful in encouraging women to give the group a try. In turn, many of the women at this location spontaneously talked about how they felt *'special'*, *'privileged'* and *'valued'*. For example, Zara expressed the experience as *'something special, something for me'*. Cari described feeling as though she was in a *'special club'*. In contrast, none of the women at Location B referred to feeling special. Feeling special effectively became part of the group culture at Location A, and demonstrates the power of suggestion as a successful marketing strategy for a new service.

### **Building positive relationships**

However difficult the initial contact, once women commenced their group antenatal care they reported high satisfaction with care. The women commented very positively for example on having the same midwives through their pregnancy, not only because they didn't have to explain issues each visit, but because of the relationships that developed as a result. Pip expressed this feeling as safety saying *'it made me feel so safe, having the same midwives'*. Several women described feeling *'cared for'* in the true sense of the phrase, rather than simply receiving care. Similarly, Cari said: *I knew the same midwives would be here waiting for me and caring about how I'd got on each week, and that made a big difference'*. Sasha talked about how good it felt that *'someone cared, someone was concerned'*. Other women described the midwives as being *'with you'*, suggesting a partnership approach; an aspect central to the group care philosophy.

Women commented on how important it was to feel accepted in the group; the fact that *'no one was there to judge'* (Gabi) was obviously very important and probably related to a

day-to-day experience of being judged in terms of their size. Iona commented that she never had to worry about what to wear to the group to *'make me look thinner'*, which was normally a daily occurrence. Lisa explained how comfortable she felt in the group, saying *'normally with women it is a competition thing'* (in relation to appearance).

Group antenatal care, in terms of the intervention, was only offered to women with a BMI  $\geq 30\text{kg/m}^2$ . This was a key aspect to participation, for example Gabi commented that she would not have attended if the group was full of *'Skinny Minnies'*<sup>13</sup>, and Beatie made a similar comment *'one of the reasons I agreed to come was because everyone would be as fat as me'*. Being in a group of women with similar weight issues made them feel comfortable as *'you can talk about anything in a group of women the same size and shape as you'* (Dale). Being with other women the same size also helped to create a feeling of being accepted, illustrated by Nora's comment *'At some time or other we've all been 'the fat woman' in a group, now we are all that fat woman'*.

It was also important that the midwives were not *'skinny'* and that *'our weight wasn't a big problem to them'* (Beatie). The *'relaxed'* and *'encouraging'* attitude of the midwives appeared to promote a feeling of unconditional acceptance; Tara commented that she felt she had freedom to talk about anything and it was *'never bad, never wrong'*. The women felt they could risk honesty in their conversations as Iona confessed *'I could have lied, but everyone was honest, and you sort of trusted each other'*.

The relaxed nature of the groups contributed to the positive responses that were generated. The women described what they liked about coming to the groups as *'the informality'*, compared to a *'strict regime'* or a *'classroom thing'* which was often what they feared at the outset. Jenny described how two hours of group time were *'a blessing..just to be able to get out of the house and be with adults'*. The community based

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<sup>13</sup> Jargon term meaning thin women



venue and the relaxed feel made many of the women feel '*normal*' compared with their care in previous pregnancies; Mai described how safe she felt in comparison to how she had experienced her last pregnancy '*It felt nice and normal....I don't feel like a risk factor waiting to blow*'. .

In summary, feeling comfortable, accepted and cared for in the groups led to the development of positive relationships, which in turn led to the perception of support and satisfaction with care.

### **Barriers to inclusion**

Practical issues such as transport to the community clinic, time off work to attend the groups (essentially a morning or an afternoon), and lack of childcare at the community venue prevented attendance on occasion for some women, and therefore presented barriers to inclusion.

The groups were designed for women of all ages and parity; the point of similarity was their gestation and weight. The women at Location A were slightly older than those in Location B (mean age in location A was 30 years and in Location B 29 years). One younger woman, Evie, commented that her age presented some barriers to feeling welcomed at location A: saying '*I was much younger than everyone else – I felt like I was the odd one out*'. Although the age gap amongst group members was a negative aspect for some younger women it worked positively for others. One of the older multiparous women at Location B, Gabi, commented that she enjoyed being able to help other women who were first time mothers: '*I felt like I was kind of mothering them too*'.

Despite the care taken to develop a supportive group culture, there were a number of women who perceived an element of stigmatism or exclusion that impacted negatively on their experience. These women were all from Location A. Location A is situated in a relatively densely populated area of Sydney where over 20% of women who gave birth

this area were born outside Australia (Centre for Epidemiology and Research 2011). The cultural norms dictate that many women in the area live with their husband's parents, and they are responsible for shopping and cooking the family's food, and where English may not be their first language. English was not the first language for four women in the sample of 10 at Location A which presented some challenges in terms of language and cultural norms. One of these women, Cari, commented on the advertising materials about the group: *'It [the poster] only has one sort of woman on it – there should be more women from other places – like women in scarves and that. So it didn't really feel like something that would suit me'*. A perception of social exclusion was a barrier to engagement and therefore had the potential to work against the achievement of the planned outcomes.

The positive feelings engendered in the groups were enhanced by peer support. This concept is explored in the next theme.

### **The power of the group**

The women were universally positive about receiving their antenatal care in a group. For many of the women interviewed this was the first time they had ever succeeded in 'managing' their weight for a sustained period of time. It was often hard to verbalise why; Gabi for example could not pin point exactly why it had 'worked' this time: *'I don't know why, but I think something clicked with that group thing'*.

The words most frequently used by the women to describe their experience of being in a group were strength and power, support and sharing.

### **Strength and power**

The positive emotions created through group antenatal care were enhanced through the 'power' the women sensed within the groups and the strength this provided. For example, Iona described this power as a form of chemistry: *'the power of women when they get together is amazing, they could do anything really'*. Rae could not explain the

phenomenon but described it as feeling like *'something happens, it's like magic really'*. Power was referred to as being shared with comments like *'women can do anything when they share power'* (Lisa) or being built through the group as illustrated by Jenny; *'I felt it was a growing sort of power, we felt we could really change things'*. The group was effectively greater than the sum of the parts as Kim described; *'the power of the group is greater than the power of one'*.

This power helped some of the women to develop a strong resolve: as Mai says *'having the other women there made it possible to be strong'*. In Mai's case, this initial comment referred to willpower, but she also went on to describe her difficulties at home with her mother-in-law *'without the strength of the group my mother-in-law would have worn me down, sometimes it is easier just to give in'*. Uma described how she felt supported by the strength of other women; *'The group made me feel that I could do it, the other women were so strong'* (Uma). The strength within the group appeared to generate a feeling of self-sufficiency: *'it felt as though we were all finding our way together and between all of us we had everything we needed to know'* (Jenny).

The power the women referred to is synonymous with 'empowerment', or developing a sense of control in regard to their efforts to achieve a healthier lifestyle. Empowerment is central to the group antenatal care philosophy, where women are actively involved in decisions related to their pregnancy (Teate et al. 2011). Feeling empowered in the context of the intervention was central to the development of the women's self-efficacy, or the belief that managing weight gain was possible.

### **Support**

Support, both social and professional, was designed as a tangible mechanism in the form of continuity of midwifery care and peer support. The findings demonstrated that the positive nature of support was a recurring concept throughout the interviews; as a reason to join a group and as a vital ingredient in building and sustaining the feeling of strength.

Some of the women admitted to coming into the group expressly for the social support it provided, not necessarily for the focus on weight management.

The support of the group was actually used as a selling point by the facilitators at Location B (much as 'feeling special' was used at Location A), where few other continuity of midwifery care models existed. For example, Iona had recently moved to Australia and wanted to meet new friends, while Lisa was experiencing an abusive relationship and attended on the advice of her social worker to engage with social support. The younger woman Evie who was single and anxious explained *'I stood on the scales each time, but I really only came for the support of the other girls and the midwives. I really needed that'*. At interview only five women spontaneously mentioned that the group supported them to manage their weight gain. This is not to say that it did not achieve this purpose, but from the women's point of view it appears that the value of the group existed primarily in the emotional support it provided, and their ability to make new friends.

Women talked about the importance of going through the experience with others saying *'it was so fabulous that I wasn't alone'* (Anna). Often this related to a previous negative experience; in Anna's case not being able to relate well to her maternity carers in a previous pregnancy, and therefore not feeling able to ask the questions she needed to. The support of the other women was instrumental in helping individuals to make lifestyle changes as this comment highlights; *'On my own I don't think I would have believed the dietitian, that it was safe, and possible to gain just a bit of weight'* (Uma).

The ability to create a social network was important, even to women who had not joined the group specifically for this reason. As time progressed and the women became more comfortable with each other they explained how *'it got better and better...we knew each other so well we could say anything at all'* (Gabi). The group friendships were often maintained after the birth of the babies and many of the women interviewed were

participating in walking groups and online Facebook communication with friends they had met through their intervention group.

### **Sharing**

The philosophy of group antenatal care involves a sharing of views, knowledge and ideas. Sharing was also part of feeling valued and building a group culture, and was therefore an important concept to achieve in the context of the intervention. Zara talked about how she never felt *'talked at'* by the group facilitators, but rather asked how she felt about things. Sharing with the other women was equally important. Anna talked about how she appreciated hearing a variety of views so she could make up her own mind on issues, rather than being simply given professional advice: *'I needed to hear other people's views, not just the midwife or the dietitian'*.

The provision of information is a major element of antenatal care. In the context of a group designed to help obese women to limit their weight gain during pregnancy there were opportunities each week to discuss issues associated with activity and healthy eating. Interpreting food labels, shopping for the family, and choosing the healthiest options from take-away menus were popular topics. Dispelling common myths was a regular element in these sessions. On several occasions, the sessions would be attended by a dietitian who joined the women's discussion.

Contrary to societal belief that women who are overweight know what they should do, but choose not to, the majority of the women who were interviewed maintained that the information they gained through the group process was invaluable and often an *'eye opener'*. This was true irrespective of the amount of weight women gained, their age or their parity. In terms of outcomes women described what they now understood; that cravings are *'not real'* for example, that food advertising *'skewed'* the way they thought about snacking, and how breastfeeding works (and why it had not worked with a previous pregnancy).

As women became more familiar with the group sessions they developed their own language in regard to healthy eating, which helped to reinforce a feeling of ownership and a group culture; *'sometimes foods'* for example, were foods which were only supposed to be eaten sometimes, perhaps once a week. *'Fist-sized protein'* led to plastic models and drawings of portions of food, which always created laughter. *'Healthy snacks'* were synonymous with healthy alternatives to the *'sometimes foods'* and women took turns to supply the group with their version of a healthy snack at each visit. Humour would often be created around this language which helped encourage a feeling of belonging and friendship.

Sharing experiences and knowledge provided a 'yard stick' for the women to measure their own progress against. Knowing that what they were doing or feeling was shared by others was reassuring as Kim mentioned *'we all had the same feelings and it was a relief to know I was normal'*. Sharing often involved talking about personal experiences and so necessitated a level of trust and a non-judgmental culture. An unexpected finding was that weight was a personal aspect that was never shared. Women would weigh themselves outside the meeting room on arrival and write the result in their antenatal records. Changes in weight would be shared week to week, but not actual weight. Cari explained: *'We didn't know each other's weight, but we knew each other's stories'*.

Women used similar phrases such as *'being in the same boat'* and *'trying to achieve the same things'*, in relation to their weight, their pregnancies and their shared goals for a healthier lifestyle. Sharing involved finding ways to overcome difficulties for example, *'The best bit was hearing how the other girls had got on, because if I'd had problems with my eating you could bet they had too'* (Lisa). Sharing practical ideas for shopping and cooking, and tips for getting through difficult times *'when you just need to eat chocolate'* (Pip) were all mentioned as helpful strategies.

The category 'Attending Group Antenatal Care' was comprised of two major themes 'Feelings about care' and the 'Power of the group'. The second category 'Staying on Track' describes mechanisms that impacted on the women's weight change during pregnancy.

### **Staying on track**

In addition to the positive emotions generated by the philosophy of group care, women described specific strategies that helped them '*stay on track*' during pregnancy. These strategies (mechanisms) included Being in the right place, Regular reinforcement and Confidence.

#### **Being in the right place**

In their examples of what worked for them, women talked about the need to be '*in the right place*' to address weight issues. If they were not psychologically ready to address their weight, none of the strategies set in place as part of the intervention would be successful. Competing priorities took precedence over weight management for some of the women. Cutting down on smoking was more important for example, to Kim; '*as well as the healthy food I had Tim Tams<sup>14</sup> instead of a cigarette*'. In Jenny's case, coping with an abusive partner precluded further challenges: '*I wasn't in a place where I could think about added stress, like eating less*'.

The women who described themselves as being in the right place seemed to be more likely to be over 30 years, and to be multiparous. These women talked about a heightened awareness that enabled them to acknowledge that their weight had become a priority. This was expressed by several women as '*not pretending anymore*' or not being able to avoid '*the truth*' that their weight mattered. Fran illustrated this by describing how the group enabled her to acknowledge and sustain her commitment: '*the other women acted as witnesses [to what was advised] I couldn't pretend I hadn't heard, or it didn't apply to me*'. Similarly, for Anna, being suddenly in the right place was a revelation: '*It was like*

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<sup>14</sup> High calorie chocolate biscuit

*coming out of the closet to say I am overweight and now I'm going to do something about it. It was like a relief in some ways'. A sustained perception of importance and priority was therefore a key element in remaining 'on track'.*

### **Regular reinforcement**

The women were asked about the strategies that helped them to view their weight as a priority. Regular messages and reminders from qualified health professionals were helpful, as was observing others' efforts and experiencing achievements vicariously.

The women said they were aware of the healthy eating messages, but needed reminding: *'You know these things but you usually don't really think about them'* (Lisa). Many of the women said they had developed an increased awareness of what and when they ate and an understanding of the difference between emotional and physical hunger. Asked what had enabled this to occur, they often talked about the value of being regularly reminded, for example, *'the group made me think every day what I put into my mouth. That never happened before'* (Jenny).

Formal goal setting was initially employed as a mechanism of the intervention, and the women were encouraged to keep a WELL (WEekly Lifestyle Log) diary. Although the women found the regular reinforcement of healthy messages useful, structured goal setting was not popular. Women reported that the WELL diary was *'too hard'*, *'couldn't get my head around it'*, and *'it took too much time'*. It seems likely that the women found goal setting too risky in terms of potential failure, for example, *'I find strict guidelines hard because if I don't reach them it stresses me out'* (Dale). Anna and Uma explained that goal setting could be counter-productive, because failure could be discouraging and would *'pull me down'* (Anna).

Only three women spontaneously spoke of their weight change in relation to official recommendations, which were referred to as *'the midwives' goals'*. Instead, each woman



appeared to have a personal barometer, which she set by comparing herself with her friends, her past experience and previous pregnancies, her priorities and her confidence in her own ability. Despite the wide range of weight change, all the women interviewed expressed satisfaction with their weight gain, even when it was above the recommended amount. Hattie commented: *'I would have had problems keeping to the 5-9kg. I put on 15kg and compared to my last pregnancy I was very happy with that'*. Another participant, Sasha, gained 12g saying: *'I didn't put on much, I was happy it wasn't over 20 kg. A friend of mine put on 45kg'*. Kim gained 30kg but she said *'It was more important to me to give up smoking'* and Pip lost 3kg saying *'I was determined this time'*.

Unsurprisingly, a dislike of goal setting was more likely to be expressed by women who gained weight in excess of the guidelines and a positive response expressed by those who gained the least weight (and incidentally, by women who achieved a normal birth). Whether this was because goal setting for some women was counter-productive, or that other women were simply more goal-orientated, is unknown. However, building women's self-efficacy, and avoiding strategies that risk a fear of failure appear to be important factors.

The majority of the women gained weight within, or below, the recommended range, and all multiparous women commented that they had never managed to do this in a previous pregnancy. An integral part of the intervention was to regularly monitor weight gain during pregnancy. The scales are often previously associated with fear, embarrassment and dread by overweight or obese women, and this strategy was introduced with caution into the groups.

The women talked about an initial reluctance to weigh themselves at the groups. However, although they talked about not being able to *'avoid'* the weigh-in or to *'escape it'*, weighing-in was surprisingly popular, as long as it was private. Women described weighing-in as another positive regular reminder: a *'focus'*, or *'check'* that kept them

*'grounded' or 'on their toes'.* It seems that the thought of the scales kept the women *'on track'* in the intervening weeks: *'Because it was a regular thing, I couldn't let it all go and then say 'oh gee, what a shame...it's too late to do anything' (Anna).* Regular weighing and having a goal was however, not a sufficient mechanism in itself. The woman talked about how their motivation to keep their weight down was enhanced by the midwives' and other women's positive reactions, even when they gained too much, Mai said *'You never felt wrong or bad, it was brilliant; the midwives always had something positive to say or found some way to encourage you'.*

External influences reduced the impact of the planned mechanisms. Food serves many purposes in families; the women described how it represented celebrations, treats, rewards, comfort, the demonstration of maternal love, and in some cases, control. Evie described conflicting messages from her mother who persuaded her to join the group and then cooked her *'huge portions'* of food. Lisa talked about her mother in law who kept encouraging her to eat, even enlisting the support of her own GP. The women's contemporaries were often unconvinced of the benefits of limiting weight gain; for example, Zara's sister-in-law told her it was *'dangerous'*, and friends regularly reminded her she had permission to eat; she was *'eating for two'* and an *'excuse to eat everything you want – you're supposed to give in to your cravings'*. Eating was actively encouraged by the preparing of high fat meals and *'treats'* for the pregnant women by family and friends. It was hard for many of the women to resist these reinforced (and often attractive) messages, and had the danger of eroding their motivation to stay on track.

Partners were mostly encouraging, but on occasions actively sabotaged attempts to introduce healthier family meals by refusing to pay for healthier foods. An unexpected positive finding was the reinforcement women gained from their children. Regular reinforcement came for example, in the form of a vegetable *'star chart'* stuck to the family fridge, a toddler's preference for healthy snacks, or a willingness in older children to learn to cook. Anna explained how external influences such as advertising had *'skewed'* her

thinking about unhealthy snack foods and sugar-laden fruit juices, but the positive responses from her children had provided her with confidence that healthier eating was possible, and would still be acceptable to her family.

### **Confidence**

The women used the word 'confident' or 'confidence' on many occasions during the interviews and focus groups in relation to 'what worked', giving an indication of its importance. Enjoyment and achievement seemed to hinge on, and result in, gaining confidence. Gaining confidence resulted from the positive feelings in group care, was integral to being able to stay on track and often noted as an outcome in its own right. It was associated initially with 'feeling good' and was increased through positive reinforcement (intrinsic, extrinsic or vicarious).

Many of the women did not have a high self-esteem; commonly describing years of feeling '*not good enough*'. The need for approval and reassurance was revealed in many interviews. In the context of the intervention, approval was most often associated with weight change. The women termed this as '*doing OK*'; if the midwives told them they were doing OK it made them feel good and was some sort of '*proof that I was doing it right*' (Anna). Feeling good and gaining approval from health professionals, friends and family generated confidence, acted as positive reinforcement and played a large part in helping women to stay on track.

Positive reinforcement was also generated vicariously through observing the success of others as this quote demonstrated '*you wanted to do well because the others were and you wanted that fabulous reaction from the midwives too*' (Mai). Positive reinforcement played a large part in the women's regular attendance at the groups which in turn helped them to stay on track: for example, '*having so much encouragement made it motivating, you wanted to go back for more*' (Beatie). This effect is similar to a positive feedback loop mechanism; the outcome (regular attendance) fed back to interact with the original

mechanism (encouragement), thereby reinforcing its effect. This concept is explained more fully in Chapter 7.

Feeling good and subsequently developing confidence was associated with personal achievement, perhaps reflecting past experiences of failure as Gabi explained: *'it [managing her weight] feels so good. Like something I've made happen, just for me and by me'* (Gabi). Mode of birth in this pregnancy and confidence appeared to be connected; women who participated in the intervention and who subsequently had a normal birth made twice as many comments about gaining confidence and experiencing positive feelings during their participation in the intervention.

Where women had managed to achieve a minimal weight gain, the physical and psychological impact became very apparent after the birth of the baby. Jenny described her own weight loss as *'mind blowing'*. Success increased confidence, which was often motivating for the whole group: Anna described how Beatie's excitement at her weight loss *'lifted her [own] spirits'*. Goal setting seemed to become spontaneous post-intervention, in line with an increase in confidence: *'I want to lose another 15kg now before I try for another [baby]'* (Beatie) *'I'm aiming for a size 14 now'* (Mai).

Feeling good about themselves strengthened the women's resolve, which in turn generated confidence about behaviour change, highlighted here: *'when you feel good it is easy to say 'I don't need to eat that biscuit', whereas before I would have eaten half a packet without noticing.'* (Nora). The women recognised that developing and sustaining confidence was a circular process and spoke of the importance of *'staying up'*, suggesting that maintaining confidence was critical to staying on track.

This sub-section has described the mechanisms of the intervention from the women's perspective: what strategies were successful in enabling the outcomes to occur, and why

these worked for some women and not others. Two main categories were identified in the data: 'Attending group antenatal care' and 'Staying on track'.

#### **6.1.4 Section summary**

Section A of Chapter 6 has presented the views of 20 women who participated in the intervention. Quantitative and qualitative data were synthesised using NVivo software in order to explore relationships in the data. Patterns in relation to what worked for whom and in which circumstances emerged from the analysis, highlighted by negative experiences and rival explanations.

Group care in both locations was unanimously popular and worked particularly well for women seeking emotional and social support. However, the outcomes in terms of weight change and behaviour change were variable. The range of the participants' weight change was extremely wide, suggesting that attendance and enjoyment of the group alone is insufficient; additional factors are essential for successful weight management. Table 15 provides an overview of what worked, for whom and in which circumstances in relation to women who participated in the study.

**Table 15: What worked, for whom and in which circumstances – women who participated in the study**

<b>What Works?</b>	
Opportunity for consideration	Awareness of the importance of gestational weight gain and knowledge of the intervention prior to the first hospital visit was more likely to achieve a positive response from women
Personal approach	A personal approach made women more likely to engage with the intervention
Relevancy	Perceiving the intervention as personally relevant is more likely to achieve initial 'buy-in' from women. Perceiving personal relevance is also critical for successful engagement with the mechanisms of the intervention
Continuity of midwifery care	The relationships that develop with the same two midwives throughout pregnancy enabled a supportive environment
Acceptance	Women were able to focus on lifestyle change when basic social and emotional needs have been met; acceptance, safety and a sense of belonging
Vicarious learning	Women learnt from sharing knowledge and experience. Observing others' achievements was more likely to lead to personal success
Peer support	Peer support enabled women to feel empowered and supported to tackle challenging lifestyle issues
Regular reinforcement	Regular reminders (such as weighing-in and sharing strategies for success) kept women focussed
<b>For Whom?</b>	
Homogenous groups	Groups where members had characteristics in common, for example BMI $\geq$ 30kg/m <sup>2</sup> , English as a first language etc
Multiparous women	Multiparous women were more likely to be concerned about their weight due to previous gestational weight gain
Older women	Older women were more likely to report behaviour change post-intervention
Heavier women	Women who had higher BMIs gained less weight and were more motivated to limit their weight gain
<b>In Which Circumstances?</b>	
Psychological readiness	Successful weight management is contingent on being psychologically ready to prioritise weight issues
Group care	The philosophy of group antenatal care supports successful weight management
Family support	Family support (partners and children) reinforces the action of the mechanisms
Positive feedback loops	Positive feedback loops continuously reactivate mechanisms and reinforce outcomes (ie Mechanism-Outcome-Mechanism) ( <i>see Chapter 7</i> )

The next section will consider the views of midwives working in the antenatal clinics who were responsible for offering the intervention to women with a BMI $\geq$ 30kg/m<sup>2</sup>.

## CHAPTER 6 – Findings section B

### 6.2 Midwives and midwifery students in the antenatal clinics who offered the intervention to women

Midwives and midwifery students in the antenatal clinics at both locations were responsible for offering the intervention to women who were categorised as obese by pre-pregnancy BMI at their booking-in appointment. Table 16 presents a summary of the demographic characteristics of this group. A detailed table of the participants' individual characteristics, including pseudonyms, is provided at Appendix 7.

**Table 16: Summary of midwives' and midwifery students' demographic characteristics**

Characteristic	Number of participants	Characteristic	Number of participants
<b>Age (years)</b>	<b>n =</b>	<b>Area of practice#</b>	<b>n =</b>
<30	8	Rotational	9
30-45	5	Core antenatal clinic	6
>45	4	Management	2
<b>Location</b>	<b>n =</b>	<b>Attended training+</b>	<b>n =</b>
A	11	Yes	3
B	6	No	14
<b>Years registered^</b>	<b>n =</b>		
<5	3		
5-10	3		
>10	8		
Midwifery student (not registered)	<b>3</b>		

**^ Years registered** = years since initial midwifery registration. Midwifery students are not registered.

**#Area of Practice definitions:**

Rotational = midwife moving between different areas of midwifery practice (birthing, antenatal clinic postnatal ward/community) for prescribed periods of time for the purpose of gaining experience or maintaining clinical skills

Core ANC = Midwives working solely in the antenatal clinic

Management = midwives with combined management and clinical responsibilities (usually in smaller hospitals)

**+ Training** = initial 2 day multi-disciplinary training provided to facilitators, midwifery staff and managers prior to the implementation of the intervention

### **6.2.1 Contextual factors**

The contextual factors identified in the initial hypotheses, or conjectured CMO configurations (Appendix 4), suggested that midwives, similar to other health professionals, are reluctant to provide weight and weight gain advice for a variety of reasons. This understanding was drawn from published evidence as described in Chapter 2. Local contextual factors such as models of care, hospital policy and process, and professional experience impacted on the way the midwives and students at the two locations engaged with the intervention and experienced their role in recruiting women to the groups. These are described below.

#### **The midwives and students**

The midwives' and students' ages ranged from less than 30 to over 45 years and there was a corresponding range of midwifery experience within the sample, with almost half of the midwives having been registered as midwives for over ten years. Three at Location A were midwifery students, who were responsible for undertaking booking-in visits without direct supervision. The majority were in 'rotational' roles, spending a period of several months at one time, or several days a week, in the antenatal clinic. A minority were 'core' or permanent antenatal clinic staff, and their role included providing support to rotational staff in relation to new practices and procedures.

The antenatal clinic midwives were an integral part of the intervention through their role in providing information and offering the intervention to women. They were not given a choice to offer the intervention to women, but were responsible for doing so in a similar way to their promotion of any other available model of care. The midwives were familiar with local requirements for a calculation of BMI at booking, but this practice would not necessarily be accompanied by a discussion of the result. At the time of the data collection there were no clinical guidelines to recommend giving advice on weight gain according to BMI, and it is unknown how many midwives were incorporating weight gain advice into



their discussions, or what that advice contained, prior to the implementation of the intervention.

As previously described, the processes for initially informing women about the intervention were markedly different at Location A and B, due to the hospital antenatal booking processes. The experience of the midwives in Location A and B was therefore dependent on the women's response to these different hospital processes.

### **The antenatal services**

At Location A, a group antenatal care model had been provided for some years (for young mothers and Chinese speaking women for example). Many of the midwives had rotated into facilitator positions, so were relatively familiar with explaining to women how the group model worked. However, women living locally to the facilities at Location A had alternative choices for care that provided continuity of carer, which subsequently presented some 'competition' to the intervention.

At Location B, group antenatal care had not been provided previously and there were few local options for continuity of carer. In terms of access, there was a much greater geographical distance between hospital and the community setting of the intervention groups at Location B, presenting transport difficulties for women. These factors impacted on recruitment to the intervention groups at both locations.

The next section considers the outcomes of the intervention; what worked for whom in relation to midwives and students in the antenatal clinics offering the intervention to obese pregnant women.

#### **6.2.2 Outcomes - or 'what worked for whom?'**

According to the conjectured CMOs, the planned outcomes specific to those offering the intervention included:

**CMO 9 – Confidence (health professionals)**

- Increased confidence in ability to provide accurate and consistent healthy eating and activity information in relation to pregnancy
- Increased confidence and competence to discuss pre-pregnancy BMI and weight gain with pregnant women who are obese

**CMO 10 - Relationship**

- Improved communication skills to support positive relationships with women.

During the focus groups midwives and midwifery students were asked to comment on whether these or any unexpected outcomes that had occurred as a result of the intervention.

**Ability to provide accurate information**

A disproportionate number of negative comments were received from the six core staff in the sample, in relation to their ability to give accurate and specific information. They were more likely to say that they did not have the knowledge to give this type of information, and additionally that it was not their role to do so. They were more likely than rotational staff to say they would offer a referral to a dietitian or to a doctor for example, possibly because they were more familiar with the available support services. Age and experience, in comparison to place of work did not appear to be related to the midwives' reported ability to provide accurate information.

Those who had attended training (three midwives) commented more positively on the knowledge they had gained in relation to the risks associated with obesity in pregnancy and also to the provision of accurate lifestyle advice (healthy eating and activity for pregnancy), and knew where they could access additional information if required.

## **Confidence and competence to talk about weight**

Overall, midwives responsible for offering the intervention to obese women commented more negatively than positively in terms of confidence to talk about weight. There were a greater proportion of negative comments from 'core' staff (permanent antenatal clinic staff) at both locations, whose confidence had not increased. This was an unexpected outcome because this group of midwives had more opportunity than the rotational staff to build confidence, and to attend in-house training and support events, being situated permanently in the antenatal clinic. Support from the project officers at each location had been put in place during the first few months of the intervention in the hope that this would continue to be provided for rotational staff through the core midwives, but appeared to have been unsuccessful.

The eight midwives who had been registered for more than ten years were also more likely to comment negatively in terms of confidence to talk about weight, but age was not similarly related to confidence. This may suggest that in this study the more experienced midwives and the 'core' midwives felt less confident in an unfamiliar situation and needed additional support to change their practice. These results can be seen in Appendix 6 in the form of an NVivo matrix created via a coding query.

Some midwives experienced a decreased level of confidence in talking to women about their weight, eventually resorting to written material in preference to conversation. Negative feedback, created by difficult encounters where attempts to discuss weight with a woman had not been well received, led to a reluctance to try again. Sarah described how a negative experience with a woman '*really shut me up*'.

Conversely, time and practice worked positively for others. The midwives at Location A were more likely than those at Location B to recount a larger number of successful communication strategies (described as mechanisms in the next section) as their confidence grew over time. Increased confidence and knowledge had a positive effect on

the practice of several of the midwives; Barb said *'I'm more focused now on women's weight...I never ever talked to women about BMI before. I just filled out the ObstetriX<sup>15</sup> screen and booked an appointment with the doctors'*.

The initial disadvantage of the system at Location A was that these midwives and students were initially not familiar with offering the service, but over time their skills and confidence developed as the intervention became an integrated part of the antenatal service. At Location B, the ability to talk easily with obese women about their weight was held by a very small number of midwives, and the intervention was viewed as a specialised service, reducing the opportunity for extending the experience and knowledge to others.

### **Unexpected Outcomes - personal and professional change**

In the focus groups, midwives were asked to comment on any unexpected or additional outcomes they or their colleagues, family or friends had noted during their participation in the intervention.

Many midwives commented that their awareness of obesity had changed. Now that they were focused on 'diagnosing' it, for the purpose of offering the intervention, they were surprised at the prevalence. Annie explained *'I'm surprised by the number of women, they look alright and yet their BMI is in that unhealthy..., you know, overweight range'*. Carol explained how she was now more aware of the potential problems related to obesity in pregnancy *'If the groups weren't there I wouldn't be as aware as I am now, and how important it is to make sure that these women get extra information, whether they go to a group or not'*. Two students reported that gestational weight gain was not a topic covered at university, but described how they had investigated the topic and chosen it for an assignment as a result of their involvement in the intervention.

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<sup>15</sup> Midwives' database software program used to collect antenatal, birth and immediate postnatal outcomes on births in NSW

In terms of personal change, the intervention could be confronting and several midwives described self-reflection in terms of unhealthy eating habits. Pam, one of the midwifery students, explained how she was now trying to lose weight before starting a family *'I went straight off and worked out my own BMI, and I'm now trying to lose some kilos before I get pregnant because I want to increase my chances of a normal birth'*. For some midwives, such as Carol, the intervention exposed uncomfortable realities about their own weight *'I would love to facilitate one of the groups, because I feel I have a lot of experience to share, but in my present state – like 'fatty bumbum' – I would feel very uncomfortable'*.

This section has discussed who the intervention 'worked' or did not work for, in terms of the planned outcomes. The next section considers the mechanisms of the intervention; the intentional and unexpected strategies that helped or hindered midwives and midwifery students in the antenatal clinic to discuss weight and weight gain and to offer the intervention to obese women.

### **6.2.3 Mechanisms – or 'why do the outcomes work in some circumstances and not in others?'**

Mechanisms describe how the intervention works below the surface, and help to explain why outcomes are achieved in some circumstances and not in others. Prior to the implementation several planned mechanisms (strategies) were put in place to increase the midwives' ability to knowledgeably and confidently discuss weight and weight gain and offer the intervention to women who were obese. These involved a combination of multidisciplinary training, onsite support and communication 'tools' to assist the process as described in Chapter 4. Alternatively, mechanisms can be non-tangible, and many of these were identified during the analysis process.

During thematic analysis six sub-categories were identified, clustered into two overall categories:

- **Maintaining the relationship**
- **Prioritising information**

## **Maintaining the relationship**

Maintaining a relationship with the woman was of paramount importance to the midwives. Three sub-categories describe how they achieved this; 'Stepping lightly', 'Developing the spiel', and 'Making it 'OK' for the woman and the midwife'.

### **Stepping lightly**

Midwives described how they approached the subject of the woman's weight with great care in order not to offend her; *'you have to step lightly, tip-toe a bit'* (Karen). Some of the midwives explained how difficult it was to raise the topic of the woman's weight; *'straight away you can feel the tension'* (Carol), *'you see them fall back in their chairs when you start talking about it'* (Liz). Many midwives used the word *'defensive'* to describe the woman's reaction to their approach, and did not know how to get beyond the woman's assurances that she ate healthily. Chris described this as a frustration *'it's very hard to try to wear that argument down and I never know where to go next'*.

Some midwives openly admitted they didn't offer the intervention at all through lack of confidence; *'I never know what to say; I just offer the brochure and say if you are interested ring the number on the back'* (Karen). Others spoke to some but not all eligible women; *'I don't go there if I can see she would hate me to say she was fat'* (Marsha), *'it depends how many knock-backs'<sup>16</sup> I've had that day'* (Chris). As previously noted, the overall recruitment rate at each location was approximately 35%, so the majority of

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<sup>16</sup> 'knock-backs' were described as those women who showed little enthusiasm for a discussion about weight or openly turned down the intervention.

women did refuse the intervention. This could be very discouraging for the midwives concerned.

Several midwives described negative experiences that had made them extremely cautious to approach the subject of weight; *'I had one woman who cried and that was awful'* (Barb); *'she just stared out the window, she wouldn't look at me'* (Karen). Similarly Nancy described how she had had to write a statement at work when a woman made a complaint about Nancy raising the topic of her weight; *'she rang up and she was fuming, she was absolutely livid. You feel a bit battered by an experience like that'*. Barb explained that she had now developed a real reluctance to approach the topic *'I feel I am expected to do it now; I don't really want to do it. I still don't really like it and I feel really awkward.'* Many of the midwives expressed frustration that they were the ones who *'took the brunt'* of the woman's reaction;

*'if we had the GPs' support, just by telling women about the service and letting us know their BMI in advance it would be so helpful. At the moment neither the women nor the midwives know what to expect'* (Nancy).

In contrast, a series of successful consultations with more *'receptive women who want to talk'* (Jess) would increase the midwives' confidence and encourage them to address the topic with less caution; *'She was really happy, she said she was so embarrassed but she was really glad I had brought it up'* (Holly). Sometimes partners would actively help the midwife by encouraging the woman to attend and making it more of a 'family' discussion; *'he was overweight too and they were trying to address their weight together'* (Pam). It was much easier to offer the intervention to women when they had had some preparation; at Location A Alex explained *'it was great, she had seen the poster outside and came in saying "that's for me"'*. These positive experiences acted as non-tangible mechanisms that helped to build confidence.

### Developing the 'Spiel'

Stepping lightly described the midwives' cautious approach to raising the topic with women. Finding the right words to talk about the woman's weight and effectively 'sell', or promote the service without offending, was a large part of a successful interaction with the woman. The midwives described this as developing their 'spiel'.

Katy explained that getting the spiel right was about practice, time and confidence; *'I've finally got it'*. The spiel included trying to normalise information about the woman's BMI, recommend weight gain, explain the risks of obesity in pregnancy and the hospital policies for additional surveillance, whilst trying to 'sell' the concept of the intervention to the woman in a friendly and professional way. It was hard to make the spiel positive and not distress the woman. Annie explained how this felt;

*'when she is all excited [about the pregnancy] but she has a BMI of 46 you have to say "....and you are obese and you have extra risks of this, this, and this", then you feel like you just burst her bubble. It's hard when you didn't set out to upset her'.*

The midwives compared this experience to the spiel that they used when doing psycho-social screening<sup>17</sup>. In contrast to their obesity spiel, they had developed this over several years and they now had it *'off pat'*<sup>18</sup> (Sarah). Annie explained that it was like any other aspect of antenatal care, needing to have the knowledge first, and then *'finding the words to explain it to the woman, without getting her offside'*; in a sense, stepping lightly.

The midwives tried to promote the concept of the groups in the most attractive way possible. The midwives talked about *'the spin'* they put on the intervention; for example they *'learnt to push the positives'*. A different advantage was emphasised in each location

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<sup>17</sup> Psycho-social screening aims to identify and support women and families with a range of social and emotional issues during pregnancy and following birth. In NSW this is achieved through comprehensive psychosocial assessments (including screening for domestic violence and depression) as a component of routine antenatal and postnatal care

<sup>18</sup> 'Off pat' is a colloquialism meaning perfectly, precisely, exactly, faultlessly



depending on existing service provision; at Location A the *'special'* nature of the service was the focus, whereas at Location B the emphasis was on the support from a known midwife. Having all the care in one place, free of charge, having access to a midwife for two hours (rather than 20 minutes), and making friends with other pregnant women were all selling points for the intervention. However, at both locations some midwives in the antenatal clinics still struggled to understand what actually took place in the groups which hindered their ability to offer the intervention in a knowledgeable way.

Most of the midwives agreed that the language of the spiel was important: Obese was an *'awful, insulting word'* (Sarah), and the *'overweight category'* (Karen) was preferred. *'When women are a bit bigger'* or *'a little larger'* were also phrases used by the midwives to explain who the groups were designed to reach. Midwives expressed the need for more onsite support and training in communication skills, especially those who had not attended the initial training days or were new to the clinic environment. One of the midwives at Location B, Karla, commented *'just hearing you talk today about how you say it is helping me'*. Hearing other midwives say their spiel helped midwives to *'learn the words'* by rote, and were mentioned by several midwives as useful strategies, although they were not necessarily underpinned by accurate knowledge or understanding.

### **Making it 'OK' for the woman and the midwife**

The midwives described how being cautious with the way the information was presented, and having a pre-developed *'normalising'* spiel helped them to maintain their professional relationship with the woman. They also described other strategies they were using that helped, in Barb's words, to *'make it OK'*, or make the interaction more rewarding for both woman and midwife. The following were all coded as *'unexpected'* (unplanned) mechanisms during the hypothesis coding process.

### **Dissociation**

The midwives described how disassociating themselves from the weight issue helped to de-personalise the information, effectively removing blame from the encounter.

Dissociation seemed to occur through the use of the various tools or props that were actually designed to increase communication. Jess explained how the interaction could be easy when she didn't look at the woman; *'I like the coloured BMI chart because I can look at that with her, not at her, when I'm saying it [telling the woman what her BMI is]'* (Jess). In a similar way, the weight gain leaflet was designed to stimulate conversation with the woman during an appointment, but it appears that it was more often used simply as written information to take home. Written information appeared to represent authority (and therefore not the midwives' fault or choice) *'It's what the hospital says, not just what I say, so it passes the buck and I'm not to blame....sort of....'* (Holly). Disassociating themselves from unpleasant information was an unexpected mechanism that the midwives employed to maintain their relationship with the woman, using tangible strategies originally set in place for another purpose.

### **Building the relationship**

Timing the discussion about obesity during the booking-in visit was often strategic; Barb explained; *'I don't do it straight up, I wait until the end... until we are sort of friends'*. For others the timing was simply part of the necessary spiel. The routine of the booking-in visit was largely dictated by the order of the ObstetriX screens. Talking to women about models of care was seen as something enjoyable to talk about, which cushioned the information about the intervention group. Jess explained *'it is easier to bring up when you talk about the available models of care because then you can say it is specially for them, and then you can talk about not putting on too much weight...and then she is usually looking interested and I'm OK.'* Barb explained how she tried to make being obese more acceptable *'I try to make it sound like a nicer risk, like twins or something, so she doesn't feel I'm trying to get rid of her[to the higher level facility], and she knows I'm on her side'*.

### **Finding common ground**

For some midwives, the issue of their own weight gave them an opportunity to find common ground, which helped to create a bond between themselves and the women. Alex described how her own experience of being 110kg in the past had really helped her to feel comfortable with women who were obese, commenting *'I don't know how the thin midwives do it'*. Although she had a normal BMI, Holly also shared her weight story and always told women she was a life member of Weight Watchers. Barb agreed; *'I find it easier to use my weight and my blood pressure as an example so she can see I'm not just getting at her'*.

### **Prioritising information**

The midwives explained that they prioritised the information that was provided to women at the booking visit (including weight and weight gain), depending on institutional requirements, time pressures, and the extent to which they felt comfortable with the topic. Four sub-categories describe the deciding factors that emerged from the data: 'Feeling unprepared', 'Competing demands', 'Not my job' and 'A lost cause'.

### **Feeling unprepared**

Various strategies, as described in Chapter 4, were put in place prior to the start of the intervention to increase the midwives' knowledge and confidence in giving accurate information on risks associated with obesity in pregnancy, healthy eating, activity, breastfeeding, and the group model of care. The midwives at Location A were more likely to highlight the communication tools (cheat sheets, weight gain leaflet and BMI chart) as important mechanisms for building confidence. This perhaps could be accounted for by the fact that their needs were more urgent; they were all responsible for offering the model of care at this location and many had not attended training events.

In the focus groups, midwives were asked how knowledgeable and confident they felt in giving information related to gestational weight gain. The midwives unanimously agreed

that giving information about healthy eating and activity during pregnancy was very important; Sarah explained for example that pregnancy was a *'prime time to talk to women about a healthy lifestyle'*. However, in practice this usually took the form of routine information about food safety and food groups. Chris explained for example that she routinely provided advice on *'iron, calcium and fluids, stuff like that, but not much else'*. The midwives reported that they felt comfortable giving their *'usual spiel'* on healthy eating in terms of food safety<sup>19</sup> and eating a *'balanced diet'*, but felt largely unprepared to give specific information such as portion sizes, foods to avoid (such as high fat foods) and weight gain.

Very few of the midwives were providing information that was specific or personalised to women, particularly those who were obese. Several midwives (irrespective of time since registration as a midwife) and midwifery students reported that they had been taught not to focus on weight gain and so they were confused and concerned by having to do so. If they did give information on weight gain they tended to advise 12-14kg, irrespective of BMI. Feeling unprepared made it less likely that they would prioritise this type of information at the booking-in visit. One of the new graduate midwives admitted *'I'm so afraid to get it wrong, so I don't say anything really'* (Carol). Positive strategies from the midwives' point of view at both locations were being able to hand out a NSW Government leaflet on healthy eating even though this contained no specific information for women who are obese.

The midwives also experienced confusion in relation to the risks in pregnancy associated with obesity. Teri said *'I knew it wasn't healthy to be overweight and pregnant, but I wasn't sure why, I sort of talk a bit vaguely about gestational diabetes'*. The *'cheat sheet'* that was written by the implementation team and laminated for use in each clinic room at both locations was mentioned by six midwives as a helpful strategy. Over time the various

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<sup>19</sup> Food safety in pregnancy involves the recommendation to wash fruit and vegetables and avoid foods that could potentially cause harm to the fetus

communication tools had disappeared from the consultation rooms, but where they still existed, they were popular and reported to be helpful. These mechanisms had been designed to assist the midwives' communication, but as described above, the midwives appeared to be more comfortable giving advice when they could distance themselves by providing written or generic information.

The midwives at Location A were essentially comfortable in discussing a group model of care, but for those at Location B this was a difficult issue as they had absolutely no previous experience. This undoubtedly affected recruitment. For example, Liz said;

*'I don't know what goes on, what they do, what group to put them in...its very tricky and awkward for me. I kind of go 'phew, she doesn't want it', so I don't have to go down that track'.*

An unexpected mechanism was noted at Location B in relation to helping midwives to become more familiar with what the intervention could offer. When antenatal clinic midwives had to 'cover' for the midwifery facilitators (for holiday or sick leave) this had the very positive effect of de-mystifying the intervention and making it subsequently easier to promote. Carol explained *'when I sat in on the group and saw them all laughing and having fun I realised how it works, and now I can 'sell' it much better'*. This strategy was so successful that all the midwives in the antenatal clinic at Location B were subsequently offered the opportunity to be more involved in the intervention in this way.

### **Competing demands**

All the midwives mentioned that they were short of time at booking in visits, and many felt overwhelmed by the amount of information they had to impart in a short time<sup>20</sup>. The midwives who had spent less time in the clinic (students and rotational staff) described the need to absorb new information and perform efficiently in this clinical environment after a very short orientation period as *'acutely stressful'*. It was apparent that some

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<sup>20</sup> Time for booking visits in NSW varies from 60-90 minutes depending on the organisation of care

midwives were enthusiastic about being part of a weight gain intervention whilst other expressed frustration with having to take on this 'additional' role. Sarah complained that *'it seems we nearly get a new thing [issue to discuss] every week to cope with'* and that a discussion on weight gain was *'all more work and no more time'*.

A 'tick list' guided the midwives' discussions which needed to be addressed during the booking-in visit, including mandatory items such as psycho-social screening. However, having a discussion was considered too time consuming for every topic; one of the students, Pam, explained how just giving written information on weight gain enabled her to *'tick that box on the list'*. Similarly, Jess explained her difficulties of being new to the role *'There has been so much to learn and fit in with each booking, let alone thinking "how do I say it" about the intervention groups'*. Deciding factors included the midwife's assumptions of the woman's needs; Sarah and Mary described for example how they would *'pick and choose'* what they thought the woman needed most. Sarah explained *'with obesity, it is kind of up to us [to suggest appropriate options]'*.

The midwife's personal interests and experiences also influenced what was discussed. Liz felt strongly, for example, that obese women should be warned of the dangers of putting on too much weight during pregnancy, whereas Marsha rated psycho-social screening as a more important issue than weight gain, in view of her personal experience of depression. Others explained that once the tick list was complete and time allowed, they were guided simply by what the woman wanted to talk about.

Success in terms of their efforts was hard for all the midwives in the antenatal clinics to measure; no information was provided to the antenatal clinics for example in terms of recruitment numbers or weight gained by women who chose the intervention groups for their antenatal care. As Sarah explained *'we don't weigh them again so how would you ever know if you had made a difference'*. Improved feedback was suggested as a mechanism that would help to build confidence.

### **Weight discussions: not my job**

Whilst all the midwives in the focus groups agreed that giving general information to all women about healthy eating and activity was important, only a minority of the midwives considered that discussing weight and weight gain with women was part of their role. The strength of opinion amongst the focus groups varied widely. Most of the midwives considered that it was a '*not a big deal for the general population*', and therefore not '*not my job directly*' (Karen).

However, four of the 17 midwives felt very strongly that they had a '*prime duty*' (Chris), to discuss weight and weight gain with women who were overweight or obese. Alex felt passionately about her role in this respect '*We have to go there, it's our job to go there, though it's not a comfortable topic*'. Carol suggested that midwives have a key role in influencing a woman's weight gain, because '*sometimes it's the first time someone has ever said that her weight is an issue*', and Liz explained that she was felt she was filling a vital gap for the young women that schools did not address. It is interesting not only that these four midwives were in the minority, but also that they all spontaneously explained that their enthusiasm for the topic had stemmed from their personal experience with excessive weight gain during pregnancy.

The midwives' role perception was influenced by their understanding of professional boundaries and expertise. Mary and Kathy felt '*unqualified*' and that they had '*no right*' to stray into what they saw as the dietitian's specialist territory, and others felt that doctors could broach the topic with much more authority than they could. Their ability to influence was considered a limiting factor; Marsha explained '*we only know these women for a few months so we probably can't make a difference anyway*'. The majority of midwives felt that their role extended as far as making a referral to a dietitian, a physiotherapist, a doctor or a counsellor, but not to '*getting personally involved*' (Mary). The midwives mentioned others who should '*take responsibility*' for the women's weight; schools, GPs, family and partners for example.

The midwives believed that the woman herself had to take responsibility to *'take it [her weight] on board'* for the midwife to be prepared to spend time discussing the issue; Jess's attitude was *'at the end of the day if the woman doesn't want to help herself we can't help her'*. Barb considered she didn't need to give weight gain information because *'everyone knows how to eat healthily, it is just whether they choose to do it or not'*. In contrast, the midwives considered the management of frequently-occurring pathology in relation to women who were obese such as a low iron level, or gestational diabetes, were considered very much within their professional remit.

Some of the midwives felt weight gain should not be actively discussed with obese women. Marsha explained *'you don't want them to know about weight gain really....it's just another source of worry, and there is so much for them to worry about'*. Kathy felt anxious about giving the wrong messages *'you have to be careful....you don't want them to actually diet during pregnancy'*. The reluctance to have weight discussions was further explained by the negative attitudes to obesity displayed by some of the midwives in the next section.

### **Weight control: a lost cause**

Negative attitudes from a minority of midwives towards women who were obese further influenced the reluctance to discuss weight and weight gain with the women. Generalised comments demonstrated almost hostile attitudes that presented significant barriers to effective communication. These implied that obese women were lazy, stupid and distasteful; *'They think they are sitting here like slim young things, in total denial. What on earth do they think they look like?'* (Chris), *'they let themselves go and use pregnancy as an excuse, lie back on the sofa and just get waited on'* (Marsha). In these comments obese women were generalised as *'they'* or de-personalised as objects, for example a *'walking time bomb'*.



Several midwives felt frustrated there was little they could do to change the situation and considered many obese women were beyond help. Barb commented for example *'they've probably heard the same words for years and they still haven't done anything about it. Most of them are probably a lost cause.'* Sarah explained that she might make a particular effort with a younger obese woman, but *'with the older ones it's like flogging a dead horse'*.

Marsha referred to obesity as being *'socially deviant'*, and several midwives made derogatory comments that implied the women were deliberately misleading healthcare professionals. Chris explained how women avoided taking any blame for their weight *'they say they are eating healthy...but in my head I'm thinking 'you aren't or you wouldn't be that size'..'* Kathy talked about the difficulty of documenting an accurate pre-pregnancy BMI *'you can see they are way over the weight they give you when they walk in here, it's a joke really'*.

Attitudes to the consequences of social deviance were apparent in debates about the appropriateness of the model of care. At Location B, where the concept of group care was unfamiliar, Karla queried the wisdom of *'clumping'* obese women together because it is effectively *'ok-ing obesity'*, and would not sufficiently *'shock the women into doing something about themselves'*. Midwives at this particular focus group suggested that having a model of care specifically for obese women could be seen as a form of reward for being obese, and that as a result the women (similar to school children) might not aspire to *'better behaviour'*.

#### **6.2.4 Section summary**

Section 2 of Chapter 6 has described the intervention from the perspective of 15 midwives and 3 midwifery students whose responsibility it was to offer the intervention to obese pregnant women; what worked and didn't work for them, and why. Quantitative and qualitative data were synthesised using NVivo software in order to explore relationships in

the data. Patterns in relation to what worked for whom and in which circumstances emerged from the analysis, and the implications of these findings will be explored in the Discussion Chapter.

Offering the intervention to women who were obese was not popular amongst the majority of midwives in the antenatal clinics. Their interest and willingness to engage with the intervention was variable, and they held different opinions in terms of role perception. Their effective engagement with the intervention was largely dependent on their personal interest and beliefs, their perception of the importance of the topic to women, their knowledge of the issues and their confidence to engage the women in conversation about weight issues.

Although healthy eating was important, other issues often took precedence due to time constraints and competing demands. The majority of midwives did not consider a discussion of weight and weight gain with obese women part of their professional role, unless it was accompanied by a medical condition such as gestational diabetes. Despite various mechanisms being in place, a reluctance to talk to women about weight issues was reinforced by having insufficient knowledge about the topic, a poor understanding of the intervention, a negative attitude towards obesity, and an impression that they were unlikely to make a difference.

Table 17 summarises what worked, for whom and in which circumstances in terms of the midwives who participated in the focus groups

**Table 17: What worked, for whom and in which circumstances – midwives and midwifery students offering the intervention**

<b>What works?</b>	
Importance	The issues must be of sufficient importance to be perceived as worth the effort
Timely training in communication skills	Training in communication skills builds confidence. Training prior to participation in the intervention was shown to be most valuable. Training needs to be ongoing in view of the regular allocation of new and inexperienced staff to the antenatal clinics
Learning from colleagues	The opportunity to listen to and learn from others (how to say the words) has the potential to provide support and enable practice change
Written materials to assist communication	Written materials provide an impression of authority and encourage the perception of importance
Positive experiences	Positive response from women in relation to the offer of the intervention builds the midwives' confidence
Regular reinforcement	Providing an opportunity to talk about 'what didn't work' and strategies that could work instead
Finding value	The recruitment activity involved time, effort and potential embarrassment. Midwives need to be able to see value (extrinsic/intrinsic) in the activity to be motivated to participate
Incentives	Building incentives into the implementation phase to encourage a change in practice, such as including a discussion of weight and weight gain on the official list of topics to be covered at booking-in
Time and practice	Midwives need to regularly offer the intervention to women in order to develop their 'spiel'. Confidence develops over time.
<b>For whom?</b>	
Midwives working in rotational positions	Midwives in rotational positions appeared to be able to be more adaptable and enthusiastic for change
Midwives who have been registered less than 10 years	Midwives who had been registered for shorter periods of time appeared to be more flexible in terms of adapting to new information and integrating this with their practice.
Midwives who have experienced being overweight	Personal experience appears to raise a perception of importance and an ability to empathise
<b>In which circumstances?</b>	
Where women have been 'prepared'	Recruitment is more successful where women have received information prior to the booking appointment
Where midwives have been adequately trained	Adequate training to involve communication skills and the provision of accurate advice and care for obese women.

The next section will consider the views of the midwives, physiotherapists and dietitians who facilitated the intervention groups at Locations A and B.

## CHAPTER 6 – Findings section C

### 6.3 Midwives, dietitians and physiotherapists who facilitated the intervention groups

The intervention groups were facilitated by midwives, dietitians, and at Location A only, a physiotherapist. The participant selection and data collection were described in Chapter 5. All participants had been working as group facilitators since the start of the intervention.

Owing to the small number and diverse professional groups of the facilitators, only the professional group and location (A or B) of the facilitators was integrated with the qualitative data during the process of analysis. Table 18 presents a summary of the facilitators who participated, by professional group and location. Pseudonyms were used to protect the identity of these individuals; these are shown in Appendix 7.

**Table 18: Summary of the facilitators' professional group and location of work**

Professional group	Number from Location A	Number from Location B
Midwives	2	3
Dietitians	1	1
Physiotherapist	1	0
<b>TOTAL</b>	<b>4</b>	<b>4</b>

Broad conclusions have been drawn in relation to 'who' the intervention worked for, but there were common factors in terms of the circumstances in which the intervention was successful. Local contextual factors at Location A and B were considerably different and these had an impact on the overall experience of the facilitators. These factors are described in the next section.

### **6.3.1 Contextual factors**

The contextual factors identified in the initial hypothesis were based on published research and suggested that engaging obese women in services designed to limit weight gain during pregnancy was likely to be challenging. This had particular relevance for the facilitators of the intervention who were responsible for running the groups, whilst in a similar way to the midwives in the antenatal clinics, they lacked previous experience in talking with obese pregnant women about weight and related issues.

During data analysis it became clear that differences existed between the two locations in terms of the healthcare professionals' experience with group antenatal care, and familiarity with the topics that were scheduled for discussion. The intervention (antenatal group care) was provided at both locations in community centres, which presented a number of organisational challenges to the facilitators. These factors are described in more detail below.

#### **The community locations**

The community centres where the groups were held were both multi-use health centres. The groups in Location A were held in a community centre approximately 2km, and groups in Location B approximately 22km, from the nearest level 5 hospital where the women were referred for obstetric consultation if complications occurred during pregnancy. This variation in distance impacted on the ease with which the facilitators could move between sites to collect or return equipment, or work flexibly during the day. Urgent referrals for medical review also posed an issue for the midwives and the women, and the ability of 'visiting' facilitators to participate at the community centres was affected; at Location B for example, a physiotherapist was unable to attend the groups due to travelling time.

An additional complication for Location B was the recent move to a 'paperless' clinical notes system, with the result that the medical details of women were only available via the computerised ObstetriX system. Without reliable network access, the midwifery

facilitators in the community centre were often left to work 'blind', carrying out antenatal checks without access to the woman's records. They described spending considerable time on the telephone to the main antenatal clinic locating results, or back at the hospital later in the day entering data, which left them with little time to plan ahead.

The groups at Location A were assigned to a named obstetrician, who visited the group monthly. The obstetrician saw each woman on at least one occasion during her pregnancy when he documented a personalised management plan. After each group the midwives and the obstetrician had a telephone conversation to report on the women's progress and to identify any issues. This arrangement contrasted with that at Location B where women were referred as necessary to an obstetrician at the Level 5 hospital, but had no continuity of obstetric care.

### **The midwives**

In contrast to the midwives in the antenatal clinics who recruited women to the intervention groups, the midwifery facilitators were selected and invited to participate. All the midwives reported being enthusiastic about their involvement in the intervention.

The midwives at Location A were deliberately 'recruited' from two hospitals, in order to promote engagement in the intervention from both antenatal clinics. In terms of facilitating groups, both midwives had previously received formal training in facilitation, and had been working in group antenatal care for over 12 months. Both were enthusiastic about the outcomes from this type of antenatal care and continued to work in other antenatal groups with 'low risk' women on different days of the week from the intervention groups. Their experience provided additional insight into the evaluation process as these midwives were able to compare and contrast what worked, for whom and in which circumstances between the various groups.

In contrast, the midwives at Location B had little or no experience of facilitating group care, and this model was untried in the Local Health District. The three midwives were drawn from either a local antenatal clinic, or were newly employed.

All the midwives reported that they had limited experience in caring for obese women at the outset of the intervention, and working off-site with a potentially high-risk group of women was new and challenging.

### **The dietitians and physiotherapists**

Neither the dietitians nor the physiotherapists who participated in the facilitation of the intervention groups had any previous experience in providing care to ‘well’ obese women. Their experience was drawn from providing advice to a defined group of women who had specifically been referred to them due to pregnancy complications. For example, they were used to providing dietary advice to obese women with gestational diabetes, or mobility advice to obese women with symphysis pubis dysfunction. In addition, they had no experience of group facilitation: their contact previously with clients was one-to-one through individual appointments.

The dietitians and physiotherapists were effectively ‘visiting’ facilitators, in that they were only present for short periods of time, and on specific occasions (such as the 20 week and 34 week gestation visits). At Location B a physiotherapist was unable to attend due to staffing difficulties and the geographical distance from the hospital.

### **6.3.2 Outcomes – or ‘what worked, and for whom?’**

According to the conjectured CMOs, the planned outcomes relevant to this group included:

**CMO 3 – Acceptability:**

- Satisfaction with group antenatal care as a means of providing high quality and comprehensive antenatal care
- Confidence in relation to facilitating groups rather than ‘providing education’ with the aim of promoting behaviour change in relation to a healthier lifestyle

**CMO 9 – Confidence (health professionals)**

- Increased confidence and competence to discuss weight and weight gain with pregnant women who are obese
- Increased confidence in ability to provide accurate and consistent healthy eating and activity information in relation to pregnancy

**CMO 10 – Relationship:**

- Improved communication skills to support positive relationships with women

**Satisfaction with the model of care**

The eight facilitators were universally positive about group care as a potential means of providing high quality and comprehensive antenatal care. The two dietitians and the one physiotherapist in the focus groups expressed enthusiasm for the efficiency of this way of working, and their ability to influence women’s lifestyle choices through a group discussion. There was some frustration though, that as ‘visiting’ facilitators it was difficult to monitor the women’s progress and (in a similar way to their hospital work) impossible to follow them up after the birth of the baby to assess long term change. There was also some debate about the resource-efficiency of providing professional outreach support far from a hospital base.

The midwives also expressed frustration with the administrative workload associated with the model. In preparation for each visit, the midwives spent a significant amount of time locating notes and results and reviewing the management plan for each woman. This preparation time took longer in off-site locations with poor information technology (IT) infrastructure where ‘paperless’ systems existed. In addition, local policies required



additional surveillance and screening for women with obesity, and there were many referrals to coordinate when complications inevitably occurred during pregnancy (such as hypertension or gestational diabetes).

The midwives at Location A commented negatively in relation to liaison with other maternity care professionals. They found that following up on queries from midwives conducting bookings in the antenatal clinic, or contacting women who were eligible but not initially offered the model of care, could be extremely time consuming. They also found that routine referrals to other health professionals, such as the anaesthetic clinic (when a woman had a BMI  $\geq 35\text{kg/m}^2$ ), could be counter-productive. The anaesthetist encouraged these women to have an epidural as early as possible in labour, contrasting to the midwives' advice to stay upright and mobile. The two midwives at Location A commented that these issues impacted negatively on the group time, and constituted the major differences between facilitating the intervention groups and their other groups of 'low-risk' women.

A perception of isolation at Location B impacted on the midwives' perception of satisfaction with the safety and quality of care. One of the three midwifery facilitators at Location B (Lyn) described her anxiety when a woman arrived with vaginal bleeding at a group meeting:

*'I told her to get back into the car and drive to xxx Hospital. She thought she should see me first, but I didn't have anything, I can't do a CTG and I didn't have any notes. I found out later she had had an emergency [caesarean] section because of the bleeding and I thought 'oh lord'.....'*

By comparison, the midwifery facilitators at Location A spoke enthusiastically about their weekly telephone 'updates' with the named obstetrician, who met individually with all the women early in their pregnancies at the community venue. The midwives at Location A were also able to maintain regular contact with the hospital antenatal staff and participate

in meetings between intervention group sessions because their hospital base and community location were in close proximity to each other.

All professional groups expressed concern for the future of the model. Eve, the physiotherapist, explained: *'the women are so pleased with their minimal weight gain during pregnancy, but then I think 'what now?''*. The midwives at Location A, who worked in a Local Health District that provided several different models of care, were keen to develop the intervention into a caseload model for birth, so that the women could benefit from continuity of carer throughout, and follow up after the birth. All facilitators saw their roles as vital to the success of the intervention, but were concerned that there was only a small 'pool' of facilitators, and that they felt they were *'letting the women down'* if they were on holiday or unwell and unable to attend. They talked about the need to *'build a bigger picture'*, where it would become the norm for all maternity care professionals to prioritise healthy eating and increased activity in their conversations with women. There was agreement that the model of care would only achieve its aims in the long term with integration into main stream services, early referral and the support of all maternity care professionals; GPs, obstetricians, antenatal clinic midwives and others who come in contact with obese pregnant women.

In summary, in this small group of multi-disciplinary facilitators, satisfaction with the model was high as a means of providing comprehensive care, provided time was allowed for preparation and attendance. As a means of providing high quality antenatal care, the model appeared to be dependent on the existence of a professional support framework appropriate to the additional needs of potentially high-risk women, an appropriate infrastructure within the community clinics, and to the ability to rapidly access tertiary referral services.

### **Confidence to facilitate group care and promote behaviour change**

More positive responses were obtained at Location A in terms of confidence in group facilitation. This may have been because the midwives at Location A had prior experience in (and were currently working in) antenatal groups at the outset of the intervention, enabling them to settle quickly into the role. In terms of feeling confident to promote behaviour change, facilitators at both locations described how their confidence had increased over time, as they learnt to allow the women to help each other find solutions, rather than 'educating' them.

The midwives at Location A expressed some frustration at not having the opportunity to influence behaviour change until the women first attended the groups at 20 weeks, whereas the midwives at Location B usually met and booked the women for antenatal care before 16 weeks of pregnancy, and were able to encourage lifestyle changes earlier in pregnancy. At Location A, this factor limited the midwives' ability to influence behaviour change over the duration of the pregnancy, and meant that the first few groups were spent playing '*catch-up*' with essential information.

### **The ability to provide accurate and consistent lifestyle information**

All facilitators responded positively in relation to learning accurate and consistent information about exercise, healthy eating and complications of obesity, and being able to present this to the women in the groups. What they didn't know at the outset they learnt from each other as time went on, building on their initial training. The value of peer support (within the facilitation team) and a willingness to share expertise were noted positively by all of the eight facilitators. Learning from each other in the groups evidently had a beneficial effect on colleagues at the hospital base; Lorna, one of the dietitians, described how her entire department was now undertaking motivational interviewing skills training in order to move away from a didactic approach to behaviour change.

## **Unexpected outcomes – personal and professional change**

The learning gained from the groups extended unexpectedly into the personal lives of the facilitators. Lorna, one of the dietitians, and Eve, the physiotherapist, had never worked with pregnant women previously. They explained how they now felt very much more comfortable working with this group of women and even confident to answer friends' questions about pregnancy. Donna, another dietitian, was pregnant and spent additional time at the groups as her pregnancy advanced; *'I find myself 'being a woman' in the group and asking the other women questions'*.

The tradition of bringing 'healthy snacks' to the groups had an influence on the midwives' and their families' eating habits. Annie said she now thought twice about buying chicken and chips on the way home from work; *'if I'm starving I make myself wait until I get home, and we've cut down the take outs'*. The effect on their children was even more significant. Mary explained how her children were playing an active part in healthier food choices; *'I look at food labels now when I never used to worry about it. When I'm shopping with the kids I get them to read the labels and we choose which one is better. They enjoy it'*. Lyn said her children looked at the picture of the healthy eating plate she had pinned the kitchen wall and her *'sugar addict son'* was now spontaneously choosing to drink water in place of sugary drinks.

### **6.3.3 Mechanisms – or 'why do the outcomes work in some circumstances and not in others?'**

As in the previous section, the data from the focus groups were coded initially by the pre-determined codes: *positive* (confirmatory), *negative* (non-confirmatory), or *unexpected* and then thematically analysed. The codes were allocated to five sub-categories, clustered into two overall categories and are described below:

- **A different way of working**
- **The rewards of teamwork.**

## A different way of working

The facilitators considered that they worked ‘in a very different way’ in the intervention, compared to their usual professional practice. Three sub-categories describe how their experience was different: ‘Facilitation skills: learning to let go’, ‘Dealing with the unexpected’: ‘Winging it’<sup>21</sup>, and ‘Professional freedom’. These sub-categories are explored below.

### Facilitation skills: learning to let go

The midwives described how the greatest challenge in their roles had been learning ‘*when to let the group go, and when to pull them back*’ (Jill), referring to the group discussions. In contrast to traditional antenatal ‘classes’, the topics covered in group antenatal care are intended to follow the concerns of the women whilst incorporating birth and parenting information. Kate explained how her training in motivational interviewing had focused her attention on the value of enabling women to focus on their own agenda:

*‘the more I try out my motivational interviewing skills, the more I know it’s alright to let them go off on tangents, it’s their needs right then and there that matter, and it’s alright to not get through the two pages of information I have to tell them - though sometimes I have to force myself to be OK about it!’*

Similarly Donna (dietitian) explained how she had slowly become used to accepting that she was not going to be able to tell the women the ‘*20 things*’ she wanted to, but had learnt to let the women take control of the discussion. This in turn had a ‘*progressive*’ effect on the facilitators’ one-to-one practice. Lorna (dietitian) explained how she had used some of the positive questioning techniques with her own clients with much success.

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<sup>21</sup> To ‘wing it’ is an idiom that means to improvise, to do something with little preparation or time to rehearse.

The dietitians talked about the '*efficiency*' of facilitating a group. They expressed how this contrasted with the usual challenges of their work place where women often did not attend for appointments or were uninterested in changing their lifestyle behaviour. By contrast, the women in the intervention groups were enthusiastic, which they put down to them knowing they weren't the only one experiencing difficulties. The dietitians explained how they fostered this '*same boat*' phenomenon by creating discussions about common experiences, such as fad diets, or cooking for the family. These discussions were then so effective that they didn't feel like they had to '*tell*' the women anything. Donna explained how this worked:

*'last week they didn't move beyond skimmed milk until 14.30! But they were getting lots out of it.....and our skills have got so much better at letting it just happen'.*

For the dietitians, this was a very different way of working from the more '*prescriptive*' education sessions they normally provided.

The facilitators tried to describe what was different about how they practised in the groups, but found it difficult to put their experience into words. Annie (midwife) said it was difficult to describe because she felt she '*did less*' than she would normally do;

*'the women really open up to us and tell us things, and I suppose I talk about things I wouldn't bring up in a normal clinic setting..but I don't think we do a lot, the women help each other, it comes from them'.*

Kate (midwife) who was new to group antenatal care, described the difference in terms of her professional approach: '*I like it so much better...we all sit down and have a chat...which is very different* [from providing care in a hospital antenatal clinic setting]'.

The result of letting go of the professional agenda (or actually '*doing less*') allowed the women to take control. Jill described this mechanism as '*enablement*':

*'it works when it gels, when you have energy in the room and lots of laughter. I see them [the women] sort of relax when they arrive and it's like – a network kind of thing. I feel those women could achieve anything together that they couldn't do alone, and it's like we [the facilitators] are just enabling something to happen'.*

Taking the time to listen to women was the most frequently cited enabling factor from the midwives' point of view. Four of the midwives used the phrase 'being listened to' as one of mechanisms that made the groups effective. Mary explained how this occurred:

*'In a normal clinic visit they have questions but sadly we are not really interested in their stuff, because we've got all this other information we need to give them in 20 minutes, we don't have more than that. But here we have 2 hours to sit and listen to them, their struggles with a toddler or whatever it is, and I think they feel empowered by being listened to. Maybe no one listened to them before'.*

Whilst most of the groups worked well with a 'loose' structure, there were occasions when the group did not 'gel', and this initially challenged the skills of the facilitators. When discussing what was different in these particular groups, the facilitators identified factors such as 'difficult personalities', or just 'luck of the draw'. As they gained more experience in facilitating groups they developed confidence in their abilities which enabled them to cope in difficult situations. Annie (midwife) described how she more actively 'managed' the group dynamics on these occasions:

*'That's when you know you are really improving as a facilitator, when you can make it work...almost against the odds.. You know, when you sort of 'work the room', pick them out...get to know the ones who will take over the group... and move it on quickly to someone else...'.*

The facilitators at both locations agreed that working in the intervention had represented a huge 'learning curve' in terms of their practice, but over time experience had improved their skills. Eve (physiotherapist) effectively summarised this when she commented 'the

*more you do it, the better you get at it..it just takes practice'*. Effective facilitation skills are essential to a successful group antenatal model of care. There is no doubt that the willingness of these facilitators to embrace a different way of working was critical to achieving the outcomes of the intervention. This suggests that selection and preparation of facilitators is a key mechanism or strategy for successful replication of the model.

### **Dealing with the unexpected: 'Winging it'**

Working in a different way, and accepting they were not necessarily the expert, was a difficult transition for some of the facilitators who were unused to allowing the women, or the clients, to lead the discussion. They described their experience of needing to be prepared for the unexpected, primarily in terms of the questions the women might ask during the session. The physiotherapist at Location A, Eve, explained *'you never really know what they [the women] will say, so you have to be ready for anything. The first group was really scary...[because it was difficult to predict how the women might respond]'*.

All the facilitators agreed they had not had enough time to prepare for the groups, as they had not been released from their normal place of work until the week the groups started. Whereas the midwives at Location A had the advantage of previous experience to draw upon, Mary at Location B described how 'terrifying' she had found the first few weeks: *'I couldn't find the program in the handbook for that week, but I had a doll and sort of fluffed through it. Now it makes me laugh but at the time it was awful'*.

Similarly Jill explained how it was *'trial and error'* without a blueprint:

*'Because everything was 'a first', I felt we were just winging it, you know, trying it out to see how it went – and if it went OK we just kept doing it. Sometimes things work and sometimes they don't, and if they don't you try something else'.*

There appeared to be little time for reflection after unexpected events because more bookings were scheduled and there were referrals to make and results to follow up. Annie



described how *'we just had to get on with it'*. This lack of time to prepare or reflect left the facilitators with the feeling of having to *'wing it'* which they found was often uncomfortable and at times stressful. For example, Annie explained that *'we felt like our heads were only just above water each week'*.

In the initial implementation period a degree of having to *'wing it'* was inevitable. However, providing care without adequate preparation time on a regular basis carries inherent risks, such as errors of judgement and *'burn out'* through exhaustion and stress. Inadequate time and inexperience therefore presented barriers to the achievement of the planned outcomes.

### **Professional freedom: working outside the box**

This sub-category relates to the facilitators' perception of professional freedom, both in a psychological and a physical sense.

The midwifery facilitators in the focus groups were universally enthusiastic about their roles and their work; Kate called it *'the highlight of my week'*.

Jill and Annie (midwives at Location A) had been antenatal group midwifery facilitators for over two years at the time of the focus groups, and talked in detail about the impact of their experience on the way they practised. Annie said;

*'it's the way I approach the woman now, more on an individual basis. Here I can talk to her like an equal, a friend, there are no barriers. When you've worked like this for a while you ask the women first..what do you think?..and it sort of becomes part of your practice and you stop "telling them" anything at all.'*

They were evidently experiencing a period of professional and personal growth which they viewed as beneficial and enjoyable. They considered themselves changed and used terms such as *'us'* and *'them'* [hospital midwives] to express this difference. Annie said she

now saw herself as a *'different sort of midwife'* and dreaded being moved back into the hospital;

*'if I had to go back and do a visit on someone I would practice just the way I do now..... I couldn't help it, and it would be different. If I had to go back it would be like crawling back into a box'.*

Jill talked about how she no longer *'ticked the boxes'* as she had done, but was much more relaxed and confident about her own decision-making;

*'you just have to try things, and being out here makes you much more resilient and willing to think of other ways of doing things, because you have to find an answer to the things that needs sorting. I suppose that word...autonomous...it makes you more like that'*

Having the confidence to develop solutions is the process of developing self-efficacy. As Jill developed self-efficacy in relation her role, she felt able to pass this positive energy to the women; *'you feel empowered so you can empower these women'*.

Professional freedom in a physical sense was associated with working off-site. At Location B, some facilitators reported a feeling of isolation, and due to the lack of infrastructure, a loss of their normal support systems. However, overall, the facilitators reported that working off-site was enjoyable because they could manage their time with women more effectively. Even at Location B, where the midwives were very preoccupied with the practicalities of running the groups, they still highlighted the freedom of being away from the hospital; *'no longer caught in the whole 'run of the mill' thing'*.

The facilitators were individually selected for their role in the groups. There was some status attached to their position as a facilitator, and they talked about feeling valued as an essential part of a new project outside their normal work environment. Donna, one of the dietitians, explained how she viewed her role as a *'great opportunity'*, and how she was

aware of the importance of the role to the success of the intervention. The facilitators' enthusiasm for their work was very apparent and no doubt played a part in the women's participation in, and enjoyment of, the groups.

## **The rewards of teamwork**

In comparison to the midwives in the antenatal clinic, the facilitators had the advantage of learning vicariously from each other and from the women at every group. They were able to witness the positive outcomes of the intervention, and receive and discuss feedback together. Two sub-categories describe this experience: 'Learning together' and 'Making a difference'.

### **Learning together**

Learning together in the groups, from each other and from the women, characterised the way knowledge and skills were shared and confidence was built. Vicarious learning, or learning by observing others, was encouraged and enabled prior to and during the group sessions. The facilitators were all experts in their own professional field, and contributed to each other's learning through teaching at the multi-disciplinary study days, the preparation of written sections for the Facilitators' Handbook, and through verbal input in the group sessions.

Eve, the physiotherapist, explained that she felt confident with the obesity 'details', but had needed a *'bit more research-based information and fine tuning for the pregnancy side of things'* when she first started with the groups. Kate (midwife) explained that she didn't know much about healthy eating for pregnancy at the outset; *'the rules and things'*. None of the facilitators had been aware of weight gain guidelines for pregnancy when they volunteered to work with the groups. Mary explained that much was new to her; *'I certainly wasn't OK with all of this six months ago'*. The sharing of expert knowledge was hugely advantageous to all the facilitators, and had the effect of rapidly skilling them to answer a variety of questions in a consistent and accurate manner.

Feeling part of a supportive team was immensely important in terms of building skills and confidence. Jill described how she felt about working with the other facilitators;

*'We rely on each other a lot and work as a team. This is different from how I work in my other groups. I didn't know Annie, Donna or Eve until the first session but we just knew we would back each other up all the way. My practice is really enhanced through working with them.'*

Skills were mastered with time and experience, such as talking about weight in a group. The facilitators supported each other through awkward situations such as this one that Annie described; *'one woman said "well, we are all here for fat classes" and I nearly died of horror', but then Jill said something that made us all laugh and I realised that was the way to go'*. Lorna, one of the dietitians, described how the women said they didn't want the subject *'shied away from'* and how the facilitators at her location had all consciously made an effort to talk very openly with the women.

Various types of behaviour modelling activities were reported as mechanisms that worked in terms of learning skills and gaining confidence. Donna, a dietitian, tried to describe what occurred during these group sessions;

*'How it all works is something about working with other people and copying what they say...I usually work on my own and there is a different energy in the room with us all together here....it rubs off on the women...the energy I mean...'*

The facilitators described how *'I watched her do it at every group', 'I looked at the women's faces while she was talking', 'it was how she said the words', 'I helped with the session on portion control, so that I could do it too'*. The facilitators in Location A were so enthusiastic about learning from each other that they had started to keep a notebook entitled *'Positive ways to approach topics'* for students or *'relieving'* care providers.

Behaviour modelling was not so successful when none of the facilitators were familiar with a topic or skill. Motivational techniques (such as goal setting) were a good example of skills that were under-used though lack of confidence. It was envisaged that goal setting would feature at the beginning and end of each group meeting, as a planning and review technique for behaviour change. Unfortunately, this did not occur on either location, despite the initial training sessions, local support and suggested activities in the Handbook. Mary explained; *'I don't think I do it very well, I kind of skip over it and I'm not really focussed on it. I get it, but I'm not sure how to put it across'*. Lyn said she would like to watch someone else use the techniques again *'it's been a long time since the training'*. The anxiety associated with the activity was apparent from Jill's comment; *'It always seems to be left to the end [of the session] and then we run out of time'*.

On review of the data it appears that the reluctance of the facilitators to use goal setting may have occurred because there was no opportunity to learn from each other. As goal setting was not a familiar activity for any of the facilitators they were not sure how to 'say it' and so tended to omit the activity, subsequently blaming the omission on lack of time or practice.

### **Making a difference**

The successful implementation of the intervention relied on different staff groups working as a team. The midwives were gratified to be able to make a difference to their colleagues' ability to recruit women to the intervention groups. Mary (midwife) explained that when the intervention groups first started, the midwives in the antenatal clinics were not recruiting at all due to lack of confidence. The midwifery facilitators were often *'called in'* to talk about the groups, or assist with recruitment. As a result, they maintained that confidence in the clinics was higher and recruitment was improved. Lyn said *'now they ring me and say 'got one for you' which is great'*.

Initially, the facilitators felt a huge responsibility, as Lyn (midwife) explained; *'for making it right, and so worried about getting it wrong'*. Receiving positive feedback was an important mechanism in building their confidence that they were making a positive difference in terms of the planned outcomes. Feedback was provided through formal means such as attendance rates, postnatal questionnaires and birth outcomes, and informal means such as the women's behaviour at the groups.

Annie (midwife) explained that some women were sceptical initially and not keen to attend, but this tended to change as they realised what was provided; *'you can tell they think 'this is good, I'm learning stuff and I'm getting my check-up too', and they keep coming back which is rewarding for all of us'*. However she accepted that there were some women resistant to change; *'you know that for some women you are not going to make any difference whatsoever'*.

The midwives were the only facilitators who saw the women at every group visit. Facilitators who did not attend the groups regularly were not able to see and hear first-hand if they were making a difference, which could be frustrating. Eve, the physiotherapist, only attended two sessions out of the total of eight for each group of women. She expressed dissatisfaction that she did not have time to follow up the women or attend more sessions because of work pressures. However, receiving feedback that the groups were making a difference was motivating; Donna, one of the dietitians, said *'After the first few months, when we looked at the women's feedback and their weights, and I knew what they [the women] were getting out of it, I was over the moon'*.

Jill (midwife) talked about the ability of the groups to make a difference in terms of increase the women's self-esteem, which she found personally satisfying and professionally rewarding;

*'I have noticed that they seem to increase their self-esteem, they can become much more positive about themselves. If you can make that difference, increase self-*

*esteem, who knows down the track what might be possible....positive choices for their baby and for their life...’.*

The midwives were proud of the fact that since the start of the intervention only one of the women had had an emergency caesarean section, and the intervention groups had a higher than average Local Health District normal birth rate for obese women, and a relatively low epidural rate. They were also delighted (and somewhat surprised) at the weight gain outcomes. Jill said *‘It’s hard to believe really, that women can actually manage to gain a minimal amount of weight. When you’ve never seen it before you kind of doubt it is going to happen’.*

In summary, it appears that the perception of being able to make a difference is a mechanism in the intervention that was vital to the building of confidence and improving performance. The facilitators’ knowledge and skills grew in line with their confidence, which evidently had a positive impact on the behaviour of the women in the groups.

#### **6.3.4 Section summary**

This section has presented the views of the eight facilitators who participated in the intervention. Qualitative data from the focus groups at each location was compared in order to explore what worked, for whom and in which circumstances.

Working in a group mode of care was unanimously popular with all eight facilitators, irrespective of their professional group. The benefits of inter-professional peer support and the advantages of vicarious learning were particularly advantageous. Satisfaction with the model as a means of providing high quality care was high, provided that appropriate support networks were in place. There were some concerns however, that long term sustainability of the model would only occur through the support and involvement of the entire maternity care team. Facilitating the groups was seen as a professional opportunity,

and in several cases appeared to have been a catalyst for professional and personal behaviour change, extending to an influence on family and friends.

Table 19 summarises what worked, for whom and in which circumstances in terms of the facilitators who participated in the intervention.

**Table 19: What worked, for whom and in which circumstances – facilitators delivering the intervention**

<b>What works?</b>	
Inter-professional peer support	Providing discipline-specific expertise to enhance provision of care
Teamwork	Working as a team to achieve goals
Vicarious learning	Watching and listening to others in the groups were opportunities for learning
Importance	Valuing the purpose of the intervention increased commitment and motivation
Working off-site	Working off-site allowed the facilitators flexibility and more opportunity for professional autonomy
Receiving positive feedback	Motivation was gained through evidence of success
<b>For whom?</b>	
Selected staff with appropriate skills and enthusiasm for change	Offering the opportunity to staff with appropriate skills and enthusiasm to act as change leaders.
Staff with previous experience in group facilitation	Previous facilitation experience enables easier transition to the model of care
Appropriately trained staff	Training in behaviour change skills and in accurate lifestyle advice and information is essential for facilitators
<b>In which circumstances?</b>	
Clinical network	Appropriate referrals to the groups from the maternity care team. Known obstetrician for consultation and referral
Physical proximity to hospital base	Ease of referral, access to resources, reduced travel time for visiting facilitators
Community locations with appropriate facilities	Network access, notes retrieval system, specimen collection arrangements etc.

The next section will consider the views of additional key stakeholders involved in the intervention.



## CHAPTER 6 – Findings section D

### 6.4 Additional key stakeholders involved in the intervention groups

Additional stakeholders involved at various levels of the intervention participated in individual interviews 10 months after implementation. The individuals interviewed in this group of stakeholders were considered to have a view in relation to the impact of the intervention groups on the existing service, and to exert considerable influence over the sustainability of the model.

This section is focussed on the conjectured CMOs that relate to the organisation of care, and therefore takes a more pragmatic view than previous sections of Chapter 6. The outcomes were, to a large extent, dependent on the organisational context at each location, although a variety of mechanisms were introduced to manage or mitigate the various issues arising from the organisational context.

Owing to the small number and diverse occupations of the individuals interviewed, only the occupation and location (A or B) of these participants was synthesised with the qualitative data during the process of analysis. Table 20 presents a summary of those who participated in the interviews by professional group and location. Pseudonyms were used to protect the identity of these individuals; these are shown in Appendix 7.

**Table 20: Summary of the additional key stakeholders' occupation and location of work**

Occupation	Number from Location A	Number from Location B
Antenatal clinic manager	2	2
Physiotherapy manager	1	0
Dietetic manager	1	0
Antenatal clinic clerk	0	1
Obstetrician	1	2
<b>TOTAL</b>	<b>5</b>	<b>5</b>

The following sub-section considers the contextual factors associated with this group of stakeholders.

#### **6.4.1 Contextual Factors**

Differences existed between Locations A and B in terms of information systems, proximity of the intervention venues to the tertiary hospitals, and the consultation and referral arrangements, which impacted on how the intervention was delivered. These differences have been described previously in this chapter.

##### **The service managers**

Midwifery managers from all four hospitals in Location A and B were interviewed. These managers felt they benefitted from a ‘bird’s eye’ view of the intervention; they had contact with women who attended the groups, with the medical staff to whom these women were referred, and also with the midwife group facilitators who they line-managed. In the smaller, lower level hospitals (levels 3 and 4), the antenatal clinic managers also worked as midwives providing clinical care, and therefore had first-hand experience of offering the intervention.

The physiotherapy and dietetic service managers managed the allied health staff who attended the groups at Location A. Unfortunately, the dietetic manager from Location B was unavailable for interview at the time of the evaluation and there was no physiotherapist involved in the intervention at that location.

##### **The antenatal clinic clerk**

As described earlier, at Location B, a clerk working within the antenatal clinic spoke by telephone to every woman booking for care, prior to allocating her booking appointment. This system ensured that women were booked directly into their chosen model of care, usually by midwives working within that model. The clerk (Amy) was therefore the first

point of contact for all women with a BMI  $\geq 30\text{kg/m}^2$ , and was a source of information during the evaluation regarding the acceptability of the model of care to this group of women.

### **The obstetric staff**

The 'named' obstetrician (obstetric consultant) at Location A held a monthly outreach clinic at the community centre during the group time. The enthusiasm and personal involvement of this obstetrician was a key factor in the initial development of the intervention. At Location B, women were not routinely seen by a medical practitioner unless their BMI was over  $35\text{kg/m}^2$ , or they developed complications. In either case they would be referred to the local tertiary (level 5) hospital to see the next available obstetric registrar or consultant, who may or may not have possessed enthusiasm and/or expertise for the care of obese women.

### **6.4.2 Outcomes - or 'what worked for whom?'**

According to the conjectured CMOs, the planned outcomes relevant to this group were:

#### **CMO 1 – Service provision:**

- A sustainable intervention in the form of group antenatal care for obese women that demonstrates:
  - Safety - effective referral pathways, communication, collaborative working
  - Logistical feasibility - adequate resources: staffing, equipment, venue

#### **CMO 3 and 4 – Acceptability (health professionals and women):**

- Health professionals report satisfaction with the model of care.  
(Acceptability is included in this section because it was anticipated that managers of the services would assess acceptability from all 'touchpoints' of the intervention)

## **Safety**

The intervention was designed for women who were obese, a group who are more likely to experience complications during pregnancy as a result of their weight. To be sustainable, the community-based intervention had to be deemed safe in terms of collaborative multi-disciplinary working and effective referral pathways and processes. Interviews with six managers across both locations revealed that safety was compromised where the infrastructure (such as network connectivity, notes retrieval and medical support) was inadequate. This situation was particularly applicable to the situation at Location B where a paperless system was introduced prior to network access in the community clinics, and the intervention lacked medical leadership.

At Location A, much of the success of the intervention was dependent on the interest and enthusiasm of one obstetrician, who made special arrangements to incorporate a monthly visit to the community centre into his other clinical responsibilities. It is questionable however, whether this situation was sustainable, as it relied on the goodwill of one individual. Interviews with key stakeholders in this group suggested a lack of whole-of-service response in both locations which compromised sustainability of the intervention overall. Strategies employed at each location to mitigate these difficulties are discussed in the following sub-section.

## **Logistical Feasibility**

The success of the intervention was measured by the managers to a large extent by the numbers of women attending the intervention groups, in order to justify use of resources. The groups were initially difficult to fill, and the time taken to constantly train rotating and new staff in how to promote this antenatal model of care to obese women was a constant source of stress for managers, especially in the first few months of implementation.

A comprehensive communication strategy was initiated prior to, and during, the first months of the intervention in an effort to invite referrals from all members of the

maternity care team, including General Practitioners (GPs). However, at time of the interviews, none of the managers at either location could recall an enquiry or a referral from an obstetrician or a GP, which was disappointing. From this response it can only be assumed that the intervention held little interest or perceived value for obstetric staff or GPs.

Staffing the intervention groups in an off-site location was considered a major logistical issue by the managers at the higher level, larger facilities, particularly those at Location B. Higher level services with numerous outpatient services are more complex to manage and this possibly accounted for the difficulty of resourcing an additional offsite model of care. At Location A, where group-based antenatal care had been established for some time, and where off-site clinics were the norm, staffing did not appear to be so problematic. Two midwives were required to attend each group one day per week, which effectively meant releasing these midwives from the main antenatal clinics on these days. Grace (midwifery manager) at Location B, commented that staffing the intervention groups was '*a considerable strain on the rest of the service*', that had effectively increased waiting time for booking appointments by four weeks. It could be argued that the midwives were still seeing the same number of women for antenatal care, but whilst numbers of women in the groups were low, this was hard for the managers to justify.

Face to face attendance at the groups by physiotherapists and dietitians was variable across the sites, depending on workload issues, geographical distance, and timing of the groups during the day. There was commitment in principle to the sustainability of the service; Jackie (dietetic manager) noted '*as a manager I am prepared to make this sustainable because I believe in the importance of the project*'. However, she suggested that unexpected workforce constraints such as maternity leave or long term sick leave, or increased demand elsewhere in the service, would make it difficult to continue to provide the same level of support.

## Acceptability

All six managers (irrespective of discipline) stated that there was no need to work hard to promote the intervention once both midwives and women had experienced it. They commented on the overwhelmingly positive response from women who attended the service, although they could not always explain why this was. Grace (midwifery manager) commented *'there is something about the model and the way it is run that the women really like'*. Narelle (midwifery manager) described how one woman had told her that that the friendships she had made and the support she had gained in the intervention group had *'turned her life around'*. This positive feedback helped to sustain the managers' support of the intervention despite indisputable organisational challenges.

The dietetic manager, Jackie, noted that job satisfaction and development opportunities had increased for her staff through involvement in the groups. Specific benefits included learning new skills, contributing to the session content through the development of the Facilitators' Handbook, and gaining information that was relevant to their practice, their lives and their families. The enjoyment that the facilitators gained from the groups had attracted a lot of interest from other staff. Jackie commented that she would soon be looking for an expression of interest when Donna, one of the dietitian facilitators, went on maternity leave; *'I expect to see at least six hands go up; they are all looking forward to it'*. Narelle (midwifery manager) was similarly positive about the midwives' response; *'They love it...totally love it. Their enthusiasm spills over to the women'*.

The intervention appeared to be acceptable to the medical staff, but perhaps more because it did not directly impact on their workload. Tom, one of the obstetricians at Location B maintained that the intervention was an *'essential service'* and must continue as *'anything we can do is better than nothing'*. However, on further questioning it became apparent that the doctors at Location B had little understanding of how the intervention actually worked; *'I think it is about a group of overweight women somewhere near xxx, although I am not sure how that works...'*. Therefore whilst the intervention was

supported by the majority, it was virtually invisible to influential groups such as medical staff. This suggests that even where an intervention may be functioning in practice, and valued in principle, additional factors are essential for successful long term sustainability.

#### **6.4.3 Mechanisms – or ‘why do the outcomes work in some circumstances and not in others?’**

The purpose of the interviews was to determine what factors made the intervention work or not work from the perspective of the stakeholders. As in the previous section, the data from the interviews were coded initially by the pre-determined codes: positive (confirmatory), *negative* (non-confirmatory), or *unexpected* in terms of how the managers experienced the mechanisms of the intervention, and then thematically analysed. The subsequent themes were allocated to six sub-categories, clustered into two categories and are described below:

- **Perceiving value**
- **Addressing organisational challenges**

##### **Perceiving value**

The value, or importance, placed on the intervention by those who had control over the necessary resources was essential to the sustainability of the model. Three sub-categories describe the mechanisms that successfully (or unsuccessfully) activated a sense of value or importance: ‘Obesity as a public health issue’, ‘Non-engagement: ‘Not our job’, and ‘Benefits to the service’. These sub-categories are explored below.

##### **Obesity as a public health issue**

All interviewees expressed concern regarding the increasing prevalence of obesity in Australia. Four of the managers interviewed noted that the intervention had a potential for long term value because it attempted to address the significant impact of obesity on health. One of the managers, Joan, termed this as ‘*societal value*’. Andrea, another manager, linked the intervention to the next generation; ‘*that is what this service is about,*

*promoting family health ...and how it translates to future pregnancies...that is what makes it so important*'. The dietetic manager, Jackie, spoke of her current experience with obese paediatric patients as an incentive to help *'break the cycle'* through an intervention aimed at promoting maternal and family health.

There was a sense of desperation in many of the remarks made by this group in regard to the impact of the *'obesity epidemic'* on their service as a whole. One of the obstetricians, Ken, spoke with fatality about the future; *'women are becoming so large now that there will be a maternal death here – it is just waiting to happen'*. The urgent need to reduce or control obesity was expressed by one manager, Narelle, as *'we need to 'capture' obese women in pregnancy'*, presumably through identification and some form of action.

Despite these perceptions of importance, it was difficult to engage all members of the maternity team to work collaboratively to support the intervention as the next sub-category demonstrates.

### **'Not our job'**

This sub-category relates mainly to the overt views of the obstetric medical staff, although there were similar views alluded to by managers.

The obstetric staff expressed concern about the number of obese women that they saw in their clinics and were all of the same view that the issue did not receive sufficient attention. The lack of local resources was keenly felt at both locations.

Although the medical staff saw obesity as a *'huge medical issue'* they did not seem to link this to any collaborative solution, and saw themselves in their current roles as being quite separate from the intervention. Ken, one of the consultant obstetricians commented that *'the development of a new service is not my professional responsibility'*. Even the 'named' obstetrician assigned this responsibility solely to midwives;



*'It's not their [the junior obstetric doctors'] responsibility to explore models of care with women; they only have time to deal with the medical side of things, and getting the women in and out. The rest is the midwife's job'.*

The focus of the intervention was not attractive to medical staff. One of the doctors commented dismissively that the responsibility for a *'simple weight loss'* lay not with the medical staff, or the midwives, but with the women; *'it is not hard to lose weight during pregnancy, many of the women are so large that even a small change in their habits would bring about weight loss'.*

The lack of medical staff engagement in the intervention appeared to be connected to a lack of visibility of the service, and a subsequent belief that a community based service provided little interest to, or impact on, their hospital responsibilities. One of the antenatal clinic managers commented *'Because it is separate from the hospital, not many of the medical staff have first-hand experience of it, although I suppose they know it exists...'*. Although the medical staff were positive about the women benefitting from the groups, the intervention had little real meaning for them in terms of participation. For example, one of the doctors suggested that the groups *'focused the women's minds on their weight'*, but then went on to state *'the service should be at xxx Hospital [as opposed to a community setting] where it is more medically accessible...'*.

### **Benefits to the services**

In contrast to the medical staff, all six managers (irrespective of their discipline) were positive about the involvement of their staff in the intervention groups. Four of the managers described a sense of pride in being involved in a *'flagship service'*, which was being implemented through NSW Department of Health funding. Positive media attention in July 2010 had highlighted the importance of the intervention and was motivational for staff associated with the groups during the first few months of implementation.

Working with other disciplines was noted as a particularly positive feature of the groups. The physiotherapy manager commented that engagement in the service was *'a very good team building opportunity in women's health'*. Both dietetic and physiotherapy managers commented that at the outset of the intervention their staff did not normally work with midwives and some had very little understanding of pregnancy, or of working with women without medical complications. The multidisciplinary approach had benefits for all concerned. One of the midwifery managers, Grace, noted that the facilitators had *'picked up information from the dietitians and physiotherapists that we have all learnt from'*.

Being involved in a preventative, less clinically focused project was reported to be a great opportunity, but also presented a need for new learning. The ability to facilitate group discussion rather than the traditional 'expert' approach was a new challenge for both the dietitians and physiotherapists, but the group philosophy had unexpected benefits for staff in these services. Jackie, the dietetic manager, commented; *'The skills of motivational interviewing have been new; assessing a woman's readiness to change for example, rather than just giving a talk on fat content in food is challenging but much more effective'*.

## **Addressing organisational challenges**

Incorporating the organisational requirements of the intervention into the existing maternity service posed challenges to the managers, and the offsite nature of the intervention added a further layer of complexity. Two sub-categories describe these challenges: "Selling' the service' and 'Multiple layers of risk'. These sub-categories are explored below.

### **'Selling' or promoting the service**

In terms of the most challenging aspect of the service, the midwifery managers commented on the issue of 'recruitment' or effectively promoting the intervention to potential participants. They maintained that midwives needed to see the value of the intervention to *'sell'* it to the women at booking appointments, and this was a barrier to

filling the groups. Some had found the concept of talking with women about their weight difficult at the outset, and had taken time to feel comfortable doing so. One midwifery manager, Joan, noted: *'It was fear of the unknown that initially held midwives back in the clinics. This is only just breaking down and it's been eight months'*.

Experiencing difficulty in attracting participants to the intervention had significant resource implications: regular staff training and support for new (and rotating) staff and students was needed in order to promote the intervention to women both face to face and by telephone. During the initial stages of implementation all the midwifery managers had developed strategies (mechanisms) to increase the confidence and knowledge of the midwives. One such strategy was to enable hospital-based midwives to step in as group facilitators for short periods to find out first-hand how the intervention worked. As a result, these midwives were able to explain the concept and therefore promote the intervention more effectively to women. Another useful strategy was to have the midwifery facilitators from the intervention groups work in the main antenatal clinics during the week to provide informal support and education sessions for other staff.

Practicalities outside the midwives' control made the concept of group care hard to 'sell' to women. Women raised issues such as difficulty with transport, lack of childcare, or time off work as reasons why they could not attend the two hour groups. In the booking clerk, Amy's, view, the community venue was not popular, and she gained the impression that the women preferred to visit the hospital for care, where they *'can see what they are getting'*. The obstetrician at Location A, Michael, commented that not only *'getting the word out there to women'* was hard, but achieving *'buy-in'* was the biggest barrier to sustainability of the intervention; *'it is something they have really got to be interested in, for them to make it work'*. As previously noted, a perception of value from both the midwives' and the women's perspective was therefore an important factor in effective promotion.

### **Multiple layers of risk**

Many of the women who participated in the intervention had existing medical complications or developed these during pregnancy. One of the outcomes noted during the first months of the intervention was that safety was compromised where the infrastructure did not support seamless care. Concerns were raised from midwifery managers in Location B about the need for adequate and specific obstetric cover that provided closer supervision of potentially high risk women. Grace, a new manager at Location B was very vocal in her concerns; *'these women have multiple layers of risk; not just a BMI of 40 for example, but a history of wound breakdown, fetal loss and a psychiatric history. The midwives are taking all this on themselves in an isolated community centre; I just worry that things will get missed'*.

These clinical issues often required referrals to a range of other care providers. This meant that the midwifery facilitators were effectively but informally 'sharing care' with a number of different services, and their role involved a complex coordination of care. The paperless notes system at Location B increased the potential for error because the network connection was unreliable and the electronic record not necessarily available. Grace and Andrea at Location B recognised that these issues represented considerable safety issues and reported that they were working to resolve them whilst supporting the facilitators and retaining the intervention.

### **6.4.4 Strategies for successful sustainability and transferability**

The set-up funding for the intervention was secured on the condition that the intervention would act as a pilot, with the aim of 'rolling out' a successful model across the state. In contrast to other participants, the managers interviewed (midwifery, dietetic and physiotherapy) clearly felt some measure of commitment to the sustainability of the intervention and spontaneously communicated very definite views on problematic issues (the local context - what was not working), and enabling factors (mechanisms - what

would assist) during their interviews. This section has been included in order to document these views.

The managers described three factors they felt were key to sustaining the intervention in their own locations in the future, and to the successful introduction of the intervention elsewhere; spreading the word more effectively, creating ‘ownership’, and making the groups more accessible to women through a more flexible approach. These factors reflect local context at the time of implementation and were further explored during the interviews. The managers suggested strategies (tangible mechanisms) that would address these issues and support future sustainability and transferability. These strategies are to some extent inter-dependent, addressing one will influence another. These strategies are listed in Table 21.

**Table 21: Strategies for successful sustainability and transferability of the intervention**

Key factors	Strategies/Mechanisms
<b>Spreading the word</b>	<p><b>Involve GPs:</b></p> <ul style="list-style-type: none"> <li>- information on models of care as mandatory in the shared care accreditation program</li> <li>- providing an option for GP shared care within the obesity intervention</li> </ul> <p><b>Involve hospital medical staff:</b></p> <ul style="list-style-type: none"> <li>- reminder system for new registrars</li> <li>- case discussion: Create a ‘slot’ for an obesity case each month on the M and M meeting to create awareness of issues</li> </ul> <p><b>Prepare women:</b></p> <ul style="list-style-type: none"> <li>- <i>Early Bird</i> pre-booking session, or a phone call to inform women about their options for care and organise booking</li> <li>- promotional video depicting different models of care for staff and for women to be played in the antenatal clinics and at staff orientation</li> <li>- local public advertising options</li> </ul> <p><b>Support low risk units:</b></p> <ul style="list-style-type: none"> <li>- video-conferencing and TeleHealth consultation options for rural areas, where obstetric or dietetic support is not immediately available (organisational buddy system)</li> <li>- online statewide forum or Discussion Board for queries and support</li> </ul> <p><b>Increase numbers of trained facilitators:</b></p> <ul style="list-style-type: none"> <li>- regular rotation of facilitators within the groups</li> <li>- publish Facilitators’ Handbook to share expertise</li> </ul>

Key factors	Strategies/Mechanisms
	<ul style="list-style-type: none"> <li>- additional training opportunities in motivational interviewing and group facilitation skills for all midwives</li> </ul> <p><b>Ensure clinical leadership:</b></p> <ul style="list-style-type: none"> <li>- wherever recruitment to the groups is taking place; behaviour modeling and individual support was shown to be most effective</li> </ul>
<b>Ownership</b>	<p><b>Support from medical staff:</b></p> <ul style="list-style-type: none"> <li>- enlist support of stream director for the identification of a named obstetrician for the intervention groups</li> <li>- develop shared care pathway with named obstetrician at hospital, to include regular liaison with midwifery facilitators</li> </ul> <p><b>Create a sense of value:</b></p> <ul style="list-style-type: none"> <li>- provide feedback to all involved on numbers recruited to the groups, weight change, birth outcomes etc . Provide monthly comparison on progress</li> </ul> <p><b>Enlist support of local research manager:</b></p> <ul style="list-style-type: none"> <li>- to create a local research project and involve medical staff especially junior registrar</li> <li>- Present model at local conferences to promote model</li> </ul> <p><b>Create Local Steering group:</b></p> <ul style="list-style-type: none"> <li>- to clarify governance and review progress</li> </ul> <p><b>Increase number of facilitators:</b></p> <ul style="list-style-type: none"> <li>- in order to increase ownership (normality) amongst a wider group of staff – less ‘elitist’</li> </ul>
<b>Accessibility</b>	<p><b>Community Location:</b></p> <ul style="list-style-type: none"> <li>- close to tertiary hospital, with a large physical space</li> <li>- convenient transport links to the venue</li> <li>- consider onsite childcare options</li> <li>- evening/weekend/alternate day options for groups</li> <li>- booking appointments at group venue to promote the sessions</li> <li>- accessibility to hospital IT network at community locations for immediate record access (as a priority)</li> </ul> <p><b>Create links with tertiary facility:</b></p> <ul style="list-style-type: none"> <li>- one session to be held on site in tertiary hospital for familiarity and to encourage normal birth through exploration of birth environment</li> </ul> <p><b>Women to carry their own notes:</b></p> <ul style="list-style-type: none"> <li>- to increase communication between care providers and to reduce risk of omission.</li> </ul>

The factors associated with local context; the need to spread the word more effectively, create local ownership of the intervention, and increase accessibility are reflected in the refined CMO configurations discussed in Chapter 7.

#### **6.4.5 Section summary**

Section D of Chapter 6 has described the intervention from the perspective of additional stakeholders who were in a position to hold a broad view on the impact of the intervention groups on the existing maternity service, and exert considerable influence over the sustainability of the model.

Managers and obstetricians in this sample were concerned about the growing numbers of obese women booking for maternity care, and the subsequent impact on their services. Both groups attributed value to the potential of the groups to address maternal obesity in the long term, and Health Department funding helped to raise the profile and increase local awareness of the intervention. The medical staff were supportive of the intervention in principle, but had little interest in practice, whereas the service managers valued the development opportunities and subsequent benefits for the women, the staff and their services.

At the time of the evaluation, the perceived value of the intervention outweighed the organisational challenges the service managers experienced, and they were prepared to make considerable effort to ensure the sustainability of the model. Additional strategies were identified by the service managers that might assist in future sustainability and transferability of the intervention. The implications of these findings will be explored in the Discussion Chapter.

Table 22 summarises what worked, for whom and in which circumstances in terms of the additional stakeholders who participated in the intervention.

**Table 22: What worked, for whom and in which circumstances – additional stakeholders involved in the intervention**

<b>What works?</b>	
Rotating staff to the intervention groups more frequently	Increases confidence and creates opportunities for training and de-briefing
Visibility of the intervention to staff and to women	Visibility (communication/physical visibility of clinic venue) increases perceived value and increases likelihood of referral/attendance
Adequate infrastructure in outreach clinic setting	Network connectivity, notes retrieval and medical support increases safety
Multi-disciplinary approach to the intervention	Staff gain knowledge and confidence from working alongside other professional groups.
Regular staff training and support	To increase the knowledge, skills and confidence of new and rotating staff and students
<b>For whom?</b>	
Selected staff with appropriate skills and enthusiasm for change	Offering the opportunity to staff with appropriate skills and enthusiasm to act as change leaders.
Managers of lower level (smaller) services	Smaller services are more flexible and less complex in terms of competing resource priorities
Medical staff who have an assigned responsibility for the service	A 'lead' obstetrician is more likely to take an active part in the intervention
<b>In which circumstances?</b>	
Cohesive clinical team	Well documented and enacted referral pathway promotes safety and quality
Accessible venue	Ease of referral, access to resources, reduced travel time for visiting facilitators and women
'Buy in' or whole of service response	Intervention must be actively supported and valued by the whole service
Pride in the service	Being a 'flagship service' is motivational to staff and encourages engagement

The Findings Chapter has been presented in four sections A – D; women who participated in the intervention, midwives and midwifery students in the antenatal clinics who offered the intervention to women, midwives, dietitians and physiotherapists who facilitated the intervention groups, and additional stakeholders who contributed to the implementation of the intervention in a number of ways.

A summary of these findings is presented in the next section as a conclusion to this chapter.



## **6.5 Summary of findings**

This summary brings together the findings from the four sections in Chapter 6 in terms of what worked for whom, and in which circumstances, for women and for health professionals in this study.

### **6.5.1 The women**

#### **What worked?**

Women reported that a personal approach from the midwife who initially raised the topic of their weight was crucial to their decision to participate. The women wanted to understand the potential complications associated with excessive weight and weight gain, but this needed to be broached with them in a sensitive way. Elements of group care were particularly helpful to their efforts to manage their weight: the continuity of midwifery care and the unconditional support from the midwives, the acceptance they perceived from the other women, the ability to learn vicariously from others, and the importance of positive regular reinforcement. Confidence in ability developed, and was regularly reinforced through positive feedback at group sessions.

Women unanimously reported that they enjoyed the group model of care but personal 'readiness' to engage with weight management was a crucial factor to success; weight management needed to be perceived as personally relevant in order to remain an important focus. However motivated they were initially, women whose social and emotional lives were relatively stable were more likely to remain focussed on weight management. For other women relationship difficulties and other lifestyle challenges often superseded weight management in terms of priority during pregnancy.

### **Who did it work for?**

In terms of weight change and reported lifestyle behaviour change, the intervention appeared to work most successfully for heavier multiparous women. Primiparous women reported feeling more confident and making more autonomous decisions in relation to their lives after the birth of their babies. Older women (aged over 30 years) were more likely to report that they had sustained changes to their lifestyle behaviour. Unexpectedly, the intervention worked particularly well when the women involved their children in meal planning and lifestyle changes.

### **In which circumstances?**

Group care was unanimously acceptable to the women in this sample. The women reported that learning from others and receiving their support was key to their ability to manage their weight gain. They were adamant that the group worked because they had shared experiences in relation to their weight, suggesting that a sense of group cohesion is essential to a feeling of support. Group cohesion promoted a form of 'group culture' in terms of language and routines, which helped to develop a sense of belonging.

The support from family and friends was key to the women's readiness to engage with the intervention; the support of the women's children appeared to be especially important. The influence of family and friends was strong and had the ability to reinforce or erode confidence, and foster or negate the woman's perception of importance in relation to their weight management.

## **6.5.2 The health professionals**

### **What worked?**

The need to create and sustain a sense of value, or sense of importance, was a key mechanism noted by all health professionals who were interviewed in relation to the implementation of the intervention. From the perspective of the facilitators of the groups,

the value of the intervention was overt; they could visibly see change occurring and commented on the motivational impact of this aspect. The midwives who were responsible for offering the intervention to the women acknowledged that the issue had to be perceived by them to be sufficiently important in order to be included in their list of topics to be discussed with women. The medical staff valued the intervention simply as a general weight management strategy, but had little understanding of how it worked, whereas the managers linked value to increased 'ownership' of the intervention. The managers interviewed suggested that the perceived value of the intervention could be increased by providing incentives such as feedback on achievements, so developing a sense local pride by show-casing these successes.

Visibility of the groups and a perception of professional relevance were mechanisms that impacted on the engagement of health professionals in this study. The regular attendance of the facilitators enabled them to engage closely with the intervention, and they perceived their ability to effect change as professionally relevant and rewarding. However, where the intervention was not actually visible, because the groups were located in the community, they were not viewed as medically relevant. This was particularly true for the medical staff who queried whether the issue of weight management was at all relevant to their professional role. In a similar way, where the midwives in the booking clinics could not visualise the groups, they were unable to describe to women how the groups functioned. An inability to engage with the intervention inevitably decreased the perception of professional relevance. The managers of the services in which the intervention functioned noted that 'spreading the word' more effectively by actively involving more staff in the running of the groups, and creating more opportunities to learn as a team through case review, could promote better engagement across the professional groups.

Confidence in ability (self-efficacy) was an important mechanism noted by all professional groups except for medical staff. Learning as a team was confidence-building for the

facilitators who associated their improved facilitation skills with the value of vicarious learning. Conversely, working alone could be de-motivating for the midwives working in the booking clinics where a negative response from women could undermine their confidence. In these situations dissociation through body language and the use of distracting physical 'tools' were mechanisms which helped this group to de-personalise a conversation about weight. Managers suggested that the confidence of their staff could be increased by rotation of staff in and out of the groups, as well as increased opportunities for training and de-briefing.

### **Who did it work for?**

The group facilitators were unanimously positive about the intervention in terms of professional growth and personal enjoyment. Staff selected for the role of facilitator with specific skills and enthusiasm for change were key to the success of the groups. Those with previous facilitation experience settled particularly quickly into their role. Medical staff were more difficult to engage if they felt they had no role in, or control over, the functioning of the service. Managers within lower level maternity services were more likely to support the intervention, perhaps because change was easier to effect, and because smaller services must necessarily be more flexible and adaptable.

Positive engagement in the intervention, and development of self-efficacy amongst midwives responsible for offering women the intervention was more likely to occur in this study with midwives who had been qualified for less than 10 years, and those who regularly worked across their full scope of practice. Positive engagement was also more likely from midwives who had experienced being (or who were currently) overweight; personal experience appeared to raise a perception of importance and an ability to empathise. The impact of an increased workload (in terms of counselling time and training requirements) on staff who had no choice to engage appeared to be a barrier to change. Training and regular reinforcement mitigated these circumstances to some extent.

### **In which circumstances?**

Health professionals in this study acknowledged that accessibility was a potential barrier to the successful engagement of both women and health professionals in the intervention. The location of the venue, the timing of the sessions, transport links, and the availability of childcare were factors that impacted on the ability to attract women into the service. Practical considerations associated with access included finding a community location with network access, and existing arrangements such as specimen collections and a notes retrieval process to support the establishment of group care. In terms of the health professionals, physical proximity to a hospital base that enabled access to resources, meetings, training events, and opportunities for visiting facilitators were significant considerations in terms of both successful implementation and sustainability.

It was noted by many of those who participated in interview or focus groups that the intervention was unsustainable without the engagement of a cohesive clinical team. This was absent in Location B, prompting concern from the managers and facilitators who emphasised the need for a well-documented referral pathway to promote safety and quality. These pathways would ideally involve a specialised clinical network and be led by a designated obstetrician. In addition, consistent messages and early referral from GPs and practice nurses in primary care was considered essential to optimal delivery of the intervention. It was noted that early engagement of women was a likely key to success and would have the potential to greatly influence outcomes.

All health professionals noted their need for adequate skills and knowledge in relation to obesity. Training that occurred prior to the implementation of the intervention was the ideal time, but many commented that the subsequent experience they had gained through their involvement in the intervention had been positive in refining their abilities.

### **6.5.3 Chapter summary**

In line with the realistic approach, this chapter has brought together the findings from the four groups of stakeholders; what worked for whom, and in which circumstances. Chapter 7 presents the refined CMO configurations based on the findings of the study, and builds on these to present a theoretical model to describe and explain the study findings and support future antenatal weight management interventions.

## **CHAPTER 7**

- REFINEMENT OF THE CONJECTURED CMO CONFIGURATIONS**
- THE GENERATION OF THEORY**

### **7.1 Introduction**

The aim of any realist evaluation is to compare reality with predicted or conjectured outcomes. A tested theory can then be developed to describe what works for whom and in which circumstances to bring about change. This chapter is presented in two distinct sections; the first section presents the refined Context-Mechanism-Outcome (CMO) configurations based on the findings of the study, and the second presents a theoretical model developed to describe and explain these findings and support future antenatal weight management interventions.

### **7.2 Refinement of the CMO configurations**

#### **7.2.1 The conjectured CMO configurations – or what was planned**

The realist evaluation framework requires the identification of theory at the outset to underpin the strategies employed in the intervention. Theory-based hypotheses, in the form of conjectured CMO configurations, were developed at the outset of the intervention and tested during the evaluation process. The conjectured CMO configurations are intended to be conceptual models of what would make the intervention work, representing presumed relationships between context, mechanism and outcome. The conjectured CMOs are presented as a realist hypothesis grid in Appendix 4.

A review of the literature enabled an understanding of the initial context in the form of potential issues that could impact on the intervention. The strategies (or tangible mechanisms) subsequently employed to bring about change were based on the Theory of Self-Efficacy; increasing the women's confidence in their ability to change their behaviour and in the maternity care providers' ability to change their practice, would be key to the achievement of the planned outcomes.

### **7.2.2 The refined CMO configurations – or what actually happened**

The refined CMO configurations represent reality (Byng 2005). Pawson and Tilley (1997) do not specify when, or to what extent the original theory should be tested, but do recommend that the information gathered during the data collection is used to define and inform the generation of theory for future interventions. The results are therefore specific to the local context at the time of the data collection. If repeated at a later date, differences might be noted reflecting contextual changes such as those associated with the development of the intervention (Tolson et al. 2007).

In common with other researchers (Jagosh et al. 2013; Marchal et al. 2012), I found it challenging when refining the CMOs of my study to cope with the very large number of mechanisms and to distinguish between the planned (tangible) and the observed (intangible) mechanisms. The outcomes however, could be identified easily, either planned or unplanned. The experience of other researchers who have successfully used the methodology eventually enabled me to refine the CMOs of my study with more confidence, and this process is explained in detail in the next sub-section.

### **Mechanisms – now you see them, now you don't...**

As described in Chapter 3, Pawson and Tilley (2009) describe mechanisms as the 'pivot' around which realist research revolves. The purpose of identifying mechanisms through the realist evaluation process is to describe what it is about an intervention that brings about any effects.



Mechanisms can be developed early in the planning of the intervention as specific tangible strategies to bring about change, such as the regular weighing of women, identified within the Conjectured CMO grid. Alternatively, mechanisms can be ‘surfaced’ during the realist evaluation process through examining how people interpret and act on an intervention (Byng, Norman & Redfern 2005, p. 89). Mechanisms that surface during this process are likely to be those that are sensitive to variation in context and may have been otherwise hidden.

The process of refining the CMO configurations highlighted the potentially multiple mechanisms and the influence of context on the outcomes of the intervention. The antenatal group intervention itself is multi-factorial, and a correspondingly large number of intangible mechanisms surfaced during the evaluation process. The resulting refined CMO configurations were complex, appearing very different from the simple diagrams constructed by Pawson and Tilley (1997, p. 58) where single mechanisms and contexts are used to illustrate the process of realist evaluation. In response to this difference, researchers have suggested various ways of managing this complexity. Ogrine and Bataldend (1985) for example, suggested that multiple contexts and mechanisms reflect the need for an intervention to be adapted to local context, or circumstance, to achieve the planned outcomes.

Managing the number of possible CMOs is one potential challenge, but another is finding an explanation for the intangible mechanisms that surface (appear), and why they surface in some cases but not in others. Dalkin et al. (2015) proposed a solution to this challenge that necessitates firstly revisiting the definition of mechanisms in relation to interventions. In Chapter 3, ‘Intentional’ or tangible mechanisms were described as those specifically designed to effect change, which will only work for some and not others. The degree of engagement with these mechanisms will depend on people’s preferences and choices (Pawson & Tilley 1997), and in line with the realist philosophy, these will depend in turn

on the context of their lives; their personal values, beliefs, current circumstances and previous life experiences.

Following along this line of thinking, Dalkin and colleagues (2015) term tangible mechanisms 'resources' that are aligned with context, as they are the components of an intervention designed to bring about change. Intangible mechanisms, such as those surfaced during my study, are termed 'reasoning'. In any intervention, resources are usually set in place to address various contextual issues. Whether the intervention participants engage with these depends on their reasoning in relation to the resource.

These authors then propose a refined formula to explain how these two types of mechanisms exist within a refined CMO:

$$\mathbf{M} \text{ (Resources) } + \mathbf{C} \text{ (Context) } \Rightarrow \mathbf{M} \text{ (Reasoning) } = \mathbf{O} \text{ (planned or unplanned Outcome)}$$

During the analysis phase of my study, I used this refined formula to differentiate between the tangible and intangible mechanisms. An example is presented below:

$$\begin{aligned} &\mathbf{M} \text{ (multi-disciplinary training) } + \mathbf{C} \text{ (inadequate knowledge and expertise) } \Rightarrow \\ &\mathbf{M} \text{ (attitudes towards women who are obese) } = \mathbf{O} \text{ (increased knowledge and expertise/no change)} \end{aligned}$$

Reasoning mechanisms can act as either enablers or barriers to change; in addition to those that bring about the planned outcomes, mechanisms may also block change (Robson 2011). The strong influence of family and friends for example, was a reasoning mechanism that supported or blocked a women's intention to be more active or eat healthier foods. The perception of value was also a mechanism which could act as a barrier (or conversely an enabler); if the intervention was not valued it was less acceptable, with the result that health professionals did not engage or strive to ensure its

sustainability, and women did not prioritise their weight gain in relation to competing priorities.

Dalkin and colleagues (2015) maintain that refining the CMO formula as described has the advantage of helping researchers to consider the impact of the mechanism concepts individually, although specific resource and reasoning mechanisms belong together in the same 'couple' or 'family' as a pair or small group. By understanding the role of context in triggering mechanisms, it can help researchers to understand how the intervention works.

Further to this train of thought, Pawson (2006a) cautions that 'triggering' does not always occur to the same intensity, especially where interpersonal relationships between stakeholders are an integral part of the intervention. This point is particularly relevant to my study where the outcomes depended heavily on the support resulting from the relationships formed between the women, and the relationships between the midwives and the women. As Dalkin et al (2015) note, there may be varying degrees of reasoning, confidence or mistrust for example, which lead in turn to a graduation of outcomes. Once this is understood, the relevant resource mechanism can be adjusted to allow for these differences in order to achieve the desired outcome. In relation to my study, the initial point of contact between the woman and the midwife introducing the intervention is a good example of a resource mechanism that needed adjustment.

The refined CMO configurations of my study are presented in Appendix 8; the Refined CMO Realist Hypothesis Grid. Additional columns have been added to the Conjectured CMO Configuration Grid to illustrate these findings. These additional columns include: 'Reasoning' Mechanisms (intangible processes identified during data collection, acting as barriers or enablers), and Occurred / 'Unplanned' outcomes or unintended consequences of the intervention. The refined grid demonstrates the grouping of a resource, with, on occasion, several reasoning mechanisms.

## **CMO configuration patterns – searching for relationships**

It has been shown in the previous section that more than one mechanism may be involved in a CMO configuration pattern, and whether or not a particular mechanism operates, and to what extent, will depend on local or personal context; it may work in one circumstance but not in another (Rycroft-Malone et al. 2010). The planned outcome of safety for example, was compromised at Location B where the communication strategies put in place did not function due to the introduction of a 'paperless' system and the unavailability of electronic records in the community location. In terms of the women, readiness to engage in weight management was only an active 'reasoning' mechanism when it became a personal priority in the face of competing demands.

A CMO pattern noted by Byng et al (2005) was that of one CMO configuration being dependent on a prior CMO configuration. This occurred in my study where an active reasoning mechanism involving positive feedback brought about an increase in the facilitators' perceived ability (self-efficacy) to support women with weight management. This CMO configuration was dependent on the women's positive weight outcomes, which were enabled in turn through the group facilitators' regular reinforcement strategies (planned resource mechanisms).

Faced with such a large number and complexity of CMO configurations it becomes difficult to determine how deeply to investigate each layer of social and physical reality (Byng, Norman & Redfern 2005). Pawson (2003) cautions against trying to examine every lead; some mechanisms will reflect theory that is well established and do not need to be examined further in depth. In relation to my study, strategies for group antenatal care have been shown to be effective in previous studies and these were therefore not re-examined. Pawson suggests focusing on emerging CMO patterns; in particular recurring CMOs and negative cases. Recurring CMOs are those which consistently demonstrate matching M-O patterns, irrespective of local context. These are particularly important because they are likely to be the factors that will enable the intervention to be successful

in a variety of other contextual situations. Negative cases are those where no association is found and the conjectured mechanisms do not achieve the planned outcomes.

In addition, Byng et al (2005) describe the usefulness of identifying ‘feedback loops’, originally described by Bhaskar (1989) in his realist work. These circular mechanism-outcome processes can help explain important and unexpected outcomes. Examples from my study of recurring CMO configurations, negative cases and feedback loop patterns are provided below. All three are important in the development of theory.

### **Recurring CMO configurations**

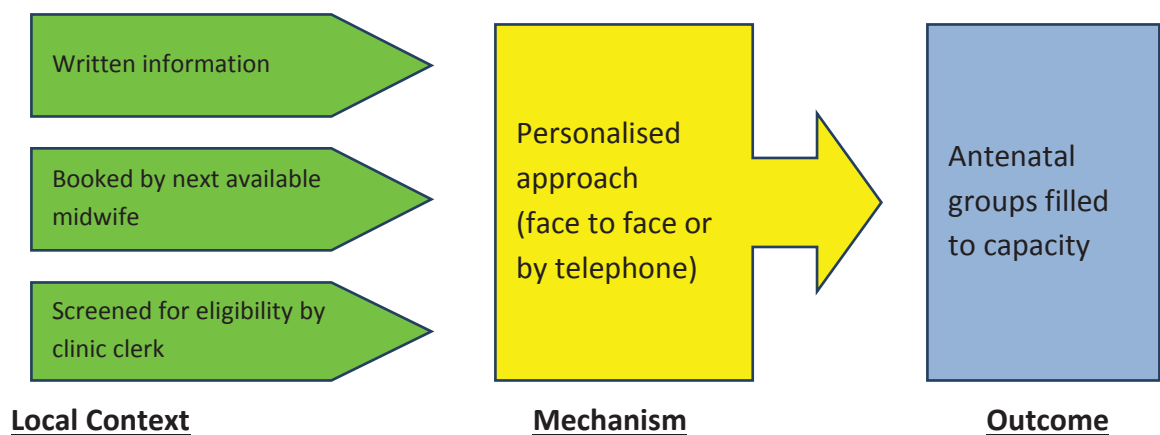
The influence of local context on the intervention is strong. However, in some cases, recurring M-O patterns will occur where the mechanism itself is strong enough to bring about the same outcome in a variety of contextual situations (Figure 2). In one of the conjectured CMO configurations, the planned outcome was to fill each antenatal group to capacity, although the research context suggested that engaging women successfully in services designed to limit weight gain is challenging. The resource mechanisms that were employed at the outset involved strategies to increase engagement and participation of women, such as written material prior to the booking appointment and telephone follow up of women who expressed interest.

The intervention was subsequently adapted to suit the local circumstances at both Location A or B, in order to achieve the planned outcome. For example, at Location B, where group antenatal care was not already in place, women with high BMIs were sent information on the intervention through the mail. Women reported that they had been initially offended by this approach, but a personal phone call by a booking clerk and subsequent referral to the trained group facilitators for booking helped to create enthusiasm (a reasoning mechanism) for engagement. In terms of unintended consequences, this strategy initially achieved higher referrals to the groups, but the model

of care continued to be seen as a specialised service, and expertise was held by a small number of group facilitators.

At Location A, where group antenatal care was already an accepted option for care, women were booked by the first available midwife. More women from this location came initially into the groups with reluctance, citing an insensitive approach by the booking midwife, but a personal phone call by a trained group facilitator did much to repair this damage. Initially at this location, referrals were low but the group model of care was more quickly integrated as a mainstream option for care than at Location B. The resource mechanism (the method by which women were offered the model of care) can therefore act initially as either a barrier or an enabler to weight management. In relation to a recurring M-O configuration, a personal approach from a midwife who had received communication skills training, either by phone or in person, was a successful recruitment strategy by creating enthusiasm, irrespective of a variety of local contextual factors.

**Figure 2: Example of a recurring CMO configuration**



A related example of a recurring CMO configuration was the relationship between the women's initial mindset (optimism or reluctance to engage) and her ability to manage her weight gain successfully. Irrespective of the strategy employed to encourage women to

engage in the program, such as mailing written material, screening by a clinic clerk, or booking by first available midwife, the women's perception of the group (positive or negative) prior to her first group appointment appeared to be all-important in setting the tone for her engagement with the group model of care, and subsequently her motivation to manage her weight gain successfully.

A further example of a recurring CMO configuration was the mechanism of experiencing behaviour modelling activities (learning vicariously by watching how others behave) through being part of a team or group. This mechanism was active for both women and for health professionals in the intervention. Wherever women or health professionals were observing or supporting each other (irrespective of where this took place), knowledge and confidence was gained through vicarious learning. Where individuals worked alone, for example midwives in antenatal clinics, behaviour could not be observed and minimal change occurred.

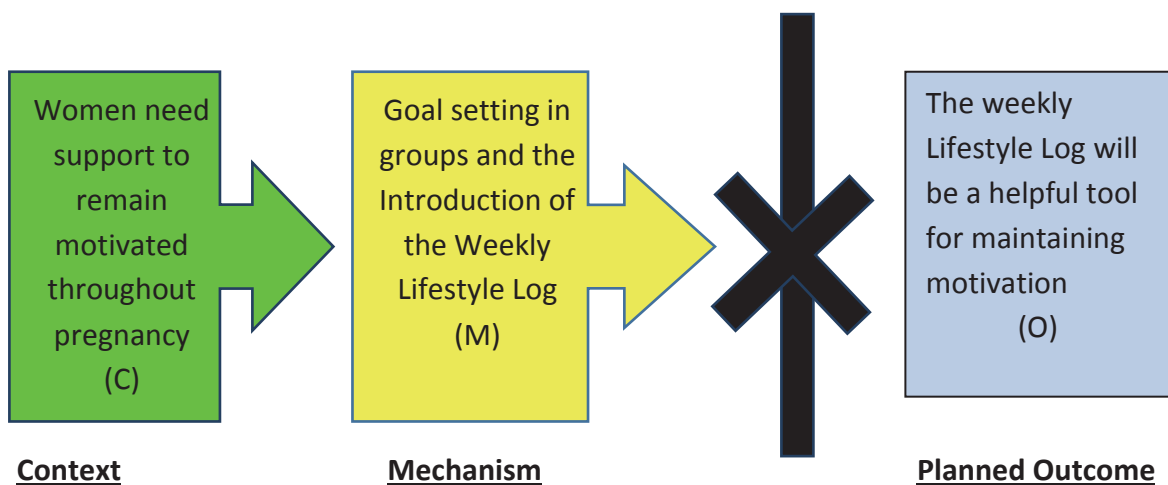
### **Negative cases**

Negative cases are those where no association is found and the conjectured mechanisms do not achieve the planned outcomes (Figure 3). Negative cases are important because they suggest these strategies are not successful and therefore cost and effort should not be spent on employing these in future planned interventions.

Research supports goal setting as a weight loss strategy in non-pregnant (Cope, Fernandez & Allison 2004) and pregnant populations (Asbee et al. 2009). It was initially conjectured that encouraging the women who participated in the intervention to set goals around healthy eating and physical activity would be a successful mechanism for weight management during pregnancy. To support this strategy, the women who participated in the intervention were provided with a WELL diary (WEekly Lifestyle Log) to record their challenges and achievements.

As explained in Chapter 6, irrespective of location, and contrary to expectation, none of the women interviewed reported that these were either helpful or supportive strategies; instead they seemed to engender anxiety and a fear of failure. Their response is illustrated by Figure 3. The reason for this negative outcome is not clear; possible explanations are discussed in the Discussion Chapter (Chapter 8).

**Figure 3: Example of a negative CMO case**



### Negative and positive feedback loops

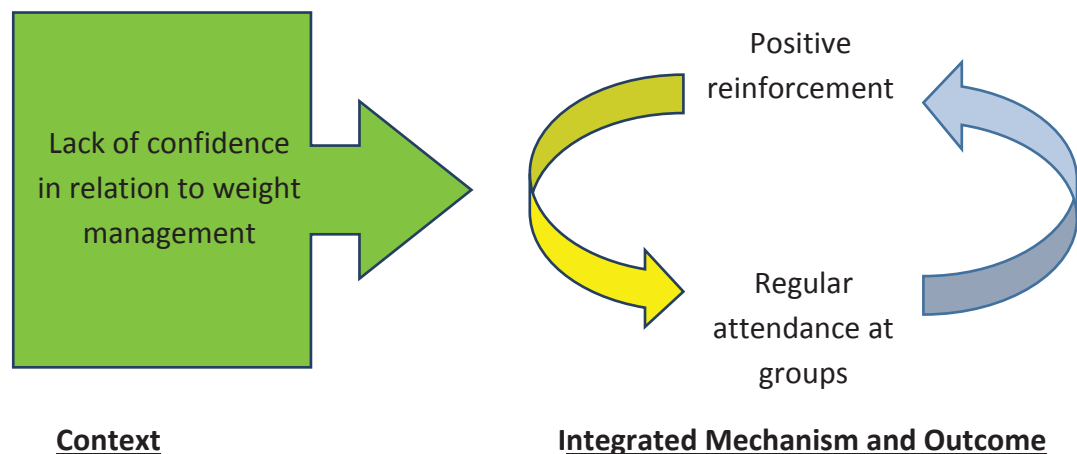
There are many possible variations in the CMO configuration structure. Byng et al (2005) describe negative and positive feedback loops as possibly the most important variation, where an outcome feeds back to interact with, and reinforce, the original mechanism. Positive feedback loops are important to replicate in future intervention/service planning because they have the potential to considerably strengthen the likelihood of achieving the planned outcome.

An example of a positive feedback loop in my study was where even in the face of initial lack of confidence (the context), positive reinforcement from both midwives and women (the mechanism) encouraged regular attendance at the groups (the planned outcome)



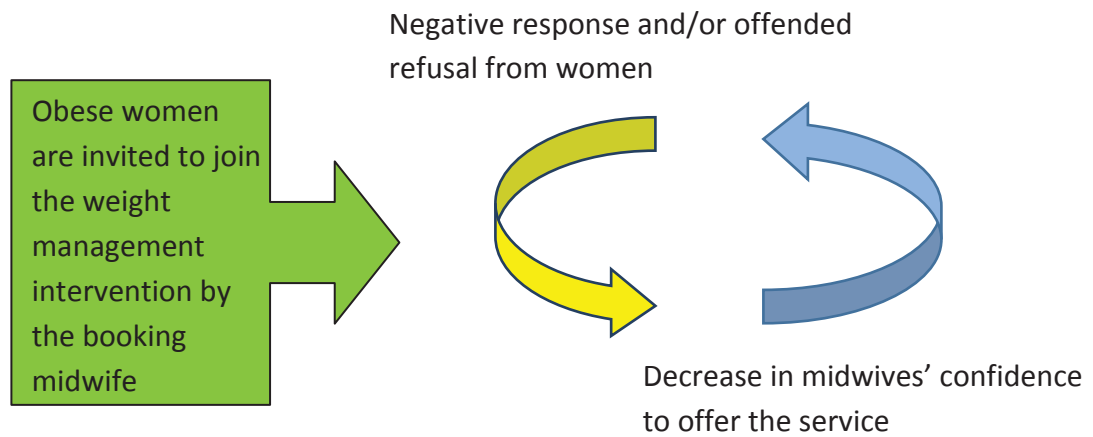
which reinforced the effect and created an increased willingness by the women to participate further. Through this circular process the mechanism and outcome become integrated, and regular attendance was consistent. This example is illustrated in Figure 4.

**Figure 4: Example of a positive feedback loop**



By contrast, a negative feedback loop is where the mechanism leads to, and reinforces, an unexpected negative outcome. An example in my study was where midwives working alone in the antenatal clinics attempted to find acceptable ways to encourage women to participate in the intervention. During this process, the midwives experienced negative responses (and sometimes offended refusal) from the majority of women. As a result, the midwives' confidence became increasingly eroded, making them less likely to try again. This example is illustrated in Figure 5.

**Figure 5: Example of a negative feedback loop**



**Context**

**Mechanism leads to and reinforces an unplanned negative outcome**

Byng et al (2005, p. 89) term this experience as a 'heart sink project', requiring significant re-design. This finding suggests that engagement of women in weight management interventions is extremely challenging, and those who are responsible for initially broaching the subject require a different mechanism (possibly entailing intensive preparation and greater ongoing support) to bring about a more positive outcome. In terms of planning future interventions, It is important to identify negative feedback loops early and intervene effectively in order to prevent a downward spiralling process of damage and loss of confidence.

### **7.2.3 Section summary**

The first section of Chapter 7 has introduced the tested and refined CMO configuration grid and identified the key role of mechanisms, both tangible and intangible, as the processes that bring about change. A variety of CMO configuration patterns emerged through the data analysis and a number of these were explored; recurring CMO configurations, negative cases and feedback loops. The second section in this chapter introduces the theoretical model that was generated through the refinement process.

## **7.3 The generation of theory**

### **7.3.1 Introduction**

Guidelines from the Medical Research Council (2009) highlight the importance of using theory alongside evidence to underpin the development of health interventions. The purpose of using theory is to help explain behaviour; for example, using theory in terms of my study can help to explain why women choose not to adopt a healthier lifestyle during pregnancy, or why clinicians are reluctant to give appropriate advice. Using theory can also provide insight into how to shape strategies to reach people most effectively, and identify what should be measured in an evaluation (Armitage & Conner 2001).

According to realist evaluation methodology, synthesis of the data and the subsequent generation of theory is the key purpose of the evaluation process (Pawson & Tilley 1997). Theory created through the process of realist evaluation attempts to explain what works in a particular situation, and is known as ‘middle range’ theory. The concept of causation, central to the realist evaluation framework, is linked to the development of middle range theory, and assists in providing possible explanations for the degree of effectiveness of healthcare interventions (Peterson 2009). Middle range (midrange) theories are more easily applied in practice than grand theories, but are sufficiently flexible to be applicable to sub-populations (Birdsall et al. 2009), such as a weight management intervention in either a rural or a metropolitan setting.

The transition from conjectured (what was planned) to refined (what happened) CMO configurations, and then to middle range theory, corresponds to the ‘culmination’ of realist evaluation discussed by Pawson and Tilley (1997). This has been achieved in my study by using an inductive approach, whereby the specific observations noted in the refined CMO configurations (as discussed earlier in this chapter) are consolidated into broader theory. This process is explained below.

### 7.3.2 Defining the theoretical concepts

Interventions designed to improve health require a degree of behaviour change (Mitchie, van Stralen & West 2011). The study intervention required both the health professionals and the recipients of the intervention (the women) to engage in strategies designed to influence behaviour, at either a personal or professional level, in order to achieve the planned outcomes of the intervention. The findings of my study to this point helped to explain what worked, for whom and in which circumstances, but not 'why'. Pawson and Manzano-Santaella (2012, p. 178) maintain that the 'trick' of realist evaluation is to explain why the 'winners are winners and the losers are losers'. The question in my study of why some individuals engaged with the intervention strategies and others did not, required a further level of analysis through searching for patterns and relationships between concepts.

Mitchie et al (2011) describe three essential conditions that help to explain why behaviours occur: motivation, capability and opportunity. In the language of realist evaluation these conditions are the mechanisms; what it is about the intervention that brings about the effects. I have correspondingly described the essential conditions in relation to weight management behaviour as intention, ability and opportunity to engage. These concepts are explained in detail below, linked to the findings of my study.

Firstly, **intention**; the study findings demonstrated that for both the women and the health professionals, making weight management a priority was an essential factor for engagement. Women spoke about only being able to focus on weight management when they were ready to do so, as described in the findings by the sub-category 'Being in the right place'. Health professionals had to be convinced of the importance of weight management, and the relevance of it to their role, to prioritise it for a topic of conversation with women, as described in the sub-categories 'Feeling unprepared', 'Weight discussion: not my job', and 'Weight control: a lost cause'. Intention to perform the behaviour was therefore key to whether this occurred.

Secondly, **ability**; for both groups, effective weight management behaviour was more likely to occur when the individual was confidently able to do so. Confidence was built through engagement with others, for example in a group setting. This was described in the findings for women as 'The power of the group' and 'Staying on track' and for health professionals as 'Developing the spiel', and 'Making it OK for the woman and the midwife'. Where this did not occur, such as in the antenatal clinics where midwives met individually with women (at the booking in appointment) the midwives' abilities, in relation to conversations about weight gain, did not develop.

Thirdly, **opportunity**; both women and health professionals described practical considerations that presented barriers and enablers to engagement. Women identified work commitments, transport, time, and childcare as barriers, and practical support from families, 'regular reinforcement', as enablers to engagement. The health professionals overwhelmingly identified time as the major barrier to incorporating weight management advice into their practice, alongside lack of opportunity (in relation to location of the community clinics), knowledge, staffing and organisational challenges. These issues were described as the sub-category 'competing demands'. Enablers included practical tools such as coloured BMI charts and written material health professionals could share with women that supported their advice. Practical considerations therefore exerted a significant influence on whether women successfully engaged in the intervention, or health professionals incorporated weight management advice into their practice.

The relationships between these conditions help to explain why the women and the midwives who took part in the intervention made the choices that they did, and have informed the development of a model for predicting the likelihood of both groups engaging in behaviour that positively influences gestational weight management. The model is adapted from *The Integrative Model of Behavior Prediction* (Church 2014) and is explained in detail in the next section.

### 7.3.3 Developing the model

In support of model development, Glanz et al (2008) maintain that health behaviour and the concepts that influence it are too complex to be explained by one theory alone. In this situation a model can assist understanding by drawing concurrently on a number of middle range theories, in addition to evidence, to explain and predict behaviour in specific situations.

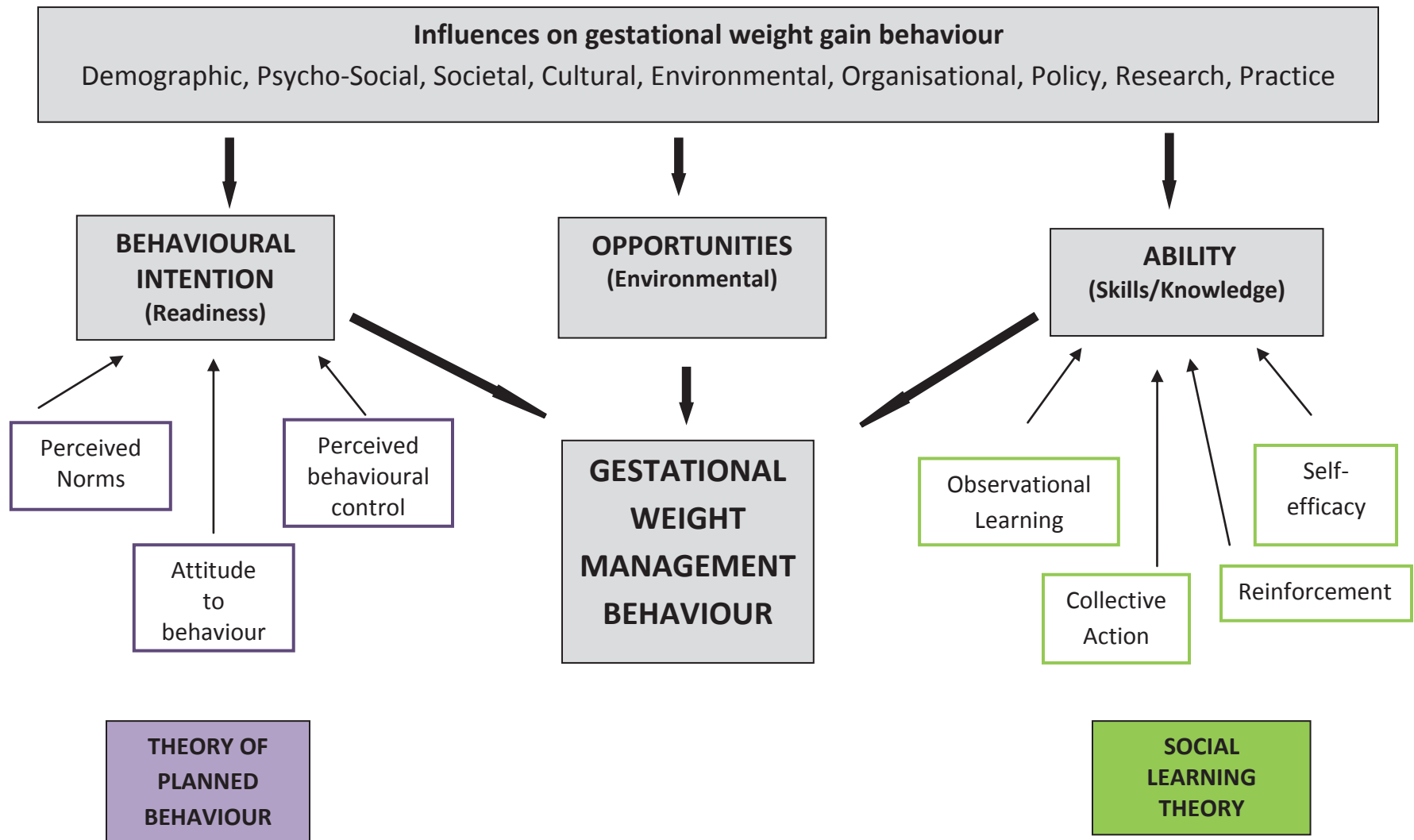
#### **Predicting behaviour in terms of gestational weight management**

Fishbein and Capella (2006) maintain that there are only a limited number of variables that need to be considered in predicting and understanding any given behaviour. First proposed in 2000 by Fishbein (2000), the *Integrative Model of Behavior Prediction* states that any behaviour is most likely to occur if a person has a strong intention to perform the behaviour, has the necessary skills and abilities and there are no environmental or other constraints preventing performance.

The *Integrative Model of Behavior Prediction* has been adapted for my study to explain the factors likely to predict positive gestational weight management behaviour within the intervention. The adapted model, *The Model of Gestational Weight Management Behaviour Prediction*, is shown in Figure 6. The model is appropriate to both the women and health professionals who participated in the intervention, in relation to gestational weight gain management. In line with the realist evaluation framework, the model is designed to explain the determinants of behaviour in the context of the intervention at both locations, generating broad ‘transferable lessons’ of interest to others (Pawson & Tilley 1997).

Figure 6: Model of Gestational Weight Management Behaviour Prediction

*Adapted from the Integrative Model of Behavior Prediction (Church 2014)*



The adapted model is underpinned by two well-established middle range theories; the Theory of Planned Behaviour (as in the original model), with the addition of specific aspects of Social Learning (Cognitive) Theory. The *Integrative Model of Behavior Prediction* stems originally from the discipline of social psychology. Villarruel et al (2015) describe the successful linking of middle range theory (such as the Theory of Planned Behaviour) from a non-related discipline (social psychology) with a nursing (and midwifery) conceptual model. These authors maintain that this process, if adequately applied, can generate a 'shared' theory, adding to the range of middle range theories available to nurses (and midwives) (McConnon et al. 2012).

The two middle range theories employed in the adapted model are briefly explained below.

### **The Theory of Planned Behaviour**

Behavioural intention (or motivation) is highly predictive of behaviour; the stronger a person's intention to perform a behaviour, the more likely it is that the behaviour will occur (Montaño & Kasprzyk 2008). The association between intention and subsequent behaviour was proposed by Icek Ajzen (1985) and subsequently conceptualised as the Theory of Planned Behaviour.

According to the Theory of Planned Behaviour, human behaviour is influenced by beliefs. The Theory of Planned Behaviour maintains that behavioural intention is determined by three elements which are all strongly associated with belief, and not totally under volitional control: attitude towards the behaviour (belief in its importance), perceived 'norms' (in relation to perceived pressure from society and significant others), and perceived behavioural control (perception of personal influence). The theoretical components of the Theory of Planned Behaviour assist in understanding why some individuals have stronger intentions than others in relation to a behaviour, such as managing weight gain during pregnancy.



The Theory of Planned Behaviour has been used in several studies to predict intention and health behaviour, including eating, exercise and weight control behaviour (Bogers et al. 2004; McConnon et al. 2012; Newham et al. 2015). The Theory of Planned Behaviour can also be utilised to measure behavioural intention of practitioners in promoting specific health behaviours such as dietary advice (Chase, Reicks & Jones 2003) .

In terms of my study, intention was related closely to women's perception of 'readiness' for weight management, and to the need for health professionals to perceive the topic to be a priority in order to be addressed effectively. Intention was influenced by a combination of beliefs; the positive or negative attitude of the individual (whether weight gain during pregnancy is viewed as important), the influence of family, friends and colleagues, social expectations, the perception of professional responsibility, and control the individual has over the behaviour (how hard or how easy it is to action).

### **Social Learning (Cognitive) Theory**

Social Learning Theory is based on established principles of learning within the social context (Bandura 1977), and has been utilised in various studies as a tool to encourage behaviour change (Hill et al. 2013). Social Learning Theory was further developed and renamed as Social Cognitive Theory in 1986 (Bandura 1986). In common with Social Learning Theory, Social Cognitive Theory is particularly associated with weight loss and maintenance initiatives (Catling et al. 2015; McGraa 2010).

The addition of this middle range theory within the adapted model is an acknowledgement of the learning process by which change occurred during implementation of the intervention, through the acquisition of skills and knowledge. Social Learning Theory states that learning occurs through cognitive and behavioural processes such as reinforcement of positive behaviour, and observation of others

(vicarious learning) which were both highlighted by both women and health professionals as particularly helpful mechanisms in my study.

Aspects of Social Learning Theory that also have relevance to my study are collective action (reciprocal interaction), self-efficacy (beliefs about personal ability), reinforcement (behaviour modification through internal or external reinforcement) and observational learning (learning through the observation of others).

## **7.4 Chapter summary**

This chapter has introduced the tested and refined CMO configurations and identified the key role of mechanisms, both tangible and intangible, as the processes that bring about change. A variety of CMO configuration patterns emerged through the data analysis and a number of these were explored; recurring CMO configurations, negative cases and feedback loops.

The *Model of Gestational Weight Management Behaviour Prediction* was developed to describe the interplay between intention, ability and opportunity in predicting individuals' response to the intervention and the possibility of change. These theoretical concepts and the middle range theories underpinning the model have been described. The next chapter discusses the application of the model, supported by the literature.

## CHAPTER 8 – DISCUSSION

### 8.1 Introduction

The aim of any realist evaluation is to produce a tested theory to describe what works for whom and in which circumstances to bring about change. The previous chapter described the development of a theoretical model; the *Model of Gestational Weight Management Behaviour Prediction* (Figure 6), which reflected the refined CMO configurations, and was underpinned by both the Theory of Planned Behaviour and Social Learning Theory.

This chapter discusses the findings of the study, within the context of the model and related published research. A framework has been created for the discussion, based on the elements of the two middle range theories. Key features that should be addressed if a similar intervention were to work in an alternative setting are presented. Finally, recommendations for future practice and research are proposed, in order to add to the body of knowledge about this topic.

### 8.2 Applying the model for predicting behaviour in relation to gestational weight management

The purpose of the model was to identify the factors in the intervention that played a part in determining weight management behaviour for both women and health professionals. As was discussed in Chapter 2, weight management behaviour is influenced by many factors including cultural, psycho-social, environmental, economic and demographic factors. Within the model these factors influence the concepts **Intention**, **Ability** and **Opportunity**. Each concept is considered separately in the next section informed by the elements of the two middle range theories where relevant; where the issues are markedly different for women and health professionals these are addressed separately.

### **8.2.1 Intention (readiness)**

According to the Theory of Planned Behaviour, intention is highly predictive of behaviour; the stronger a person's intention to perform a behaviour, the more likely it is that the behaviour will occur (Montaño & Kasprzyk 2008).

As previously described, behaviour is influenced by beliefs. Identification of beliefs is essential because modifying these may result in changes in people's behaviour. The women and the health professionals who participated in my study reported a range of beliefs related to weight gain during pregnancy, in addition to the emotions related to these beliefs. These are discussed below in relation to **Attitude, Perceived norms** and **Control beliefs**.

## **Attitude**

### **Attitudes of the women**

Behavioural beliefs are associated with attitude (Armitage & Conner 1999; Fishbein & Yzer 2003). In line with published research (Smith & Lavender 2011), the women in my study expressed an initial belief that a substantial amount of weight gain during pregnancy was normal and inevitable. Although seen as inevitable, some women reported a fear or a horror associated with further weight gain, especially if they had gained substantial amounts of weight in previous pregnancies.

Such concerns helped to enhance the 'readiness' of some of the women to engage with the intervention, although fear-raising 'per se' has not been shown to be universally successful in changing attitudes towards health related behaviour (Witte & Allen 2000). Albarracin et al (2005) undertook a meta-analysis of interventions to prevent HIV, and found that fearful health messages may trigger feelings of powerlessness and ultimately denial amongst target populations. Robertson (2008) suggests that preventive behaviour messages such as healthy eating are more effective if promoted using a 'gain frame',

which describes the benefits of a desired action – for example, promoting healthy eating by saying it will help the person to live longer.

Interventions are therefore more likely to successfully affect behaviour by creating a positive attitude to a healthy lifestyle through an emphasis on positive outcomes.

Evidence demonstrates that during pregnancy women are predominantly focussed on the wellbeing of the baby, but interestingly only one woman in my study revealed that she had joined the group for her baby's health. Published research (Heslehurst 2013; Olander et al. 2011), suggests that the benefits of a healthy maternal weight gain to neonatal and child health is not well understood by women. In terms of creating positive attitudes to interventions designed to promote a healthy gestational weight gain, a focus on the baby's health may be the best incentive (Sui, Turnbull & Dodd 2012).

The literature suggests that the more positive the belief, the more positive the attitude will ultimately be towards change (Fishbein 2000). The benefit of a positive attitude is highlighted by my findings; women who described a positive (optimistic) attitude to enrolment in the intervention were more likely to manage their weight gain successfully, compared to women who initially attended the service reluctantly. This finding is supported by a qualitative study underpinned by the Theory of Planned Behaviour, which considered the influence of behaviour patterns on weight loss (Barberia, Attree & Todd 2008). Seventeen obese and overweight Spanish women who were enrolled in a weight-loss treatment were interviewed to investigate their beliefs in relation to the benefits of losing weight and the emotions related to dieting. The study concluded that the more positive these beliefs were, the more positive the women's attitude towards the diet seemed to be.

The group sessions of the study intervention were focused on changing behaviour by providing consistent information about healthy eating and activity. The provision of information alone has not been shown to influence behaviour (Robertson 2008).

However, the provision of information may raise a women's perception of importance and influence her beliefs related to weight gain during pregnancy. The perception of importance is related to a positive attitude towards a behaviour and is considered to be one of the most important elements of motivation (Rollnick et al. 2010).

Rollnick et al (2008) describe motivation as a state, not a trait, being affected day to day by numerous factors. The dynamic state of pregnancy inevitably affects the sustainability of motivation for behaviour change in relation to gestational weight management (Hill et al. 2013). Some of the women in my study retained very positive attitudes to the importance of a healthy weight gain throughout pregnancy, but in others, attitudes tended to fluctuate and in some cases were difficult to sustain.

It is likely that maternal mood is linked to the ability to sustain positive attitude in obese pregnant women. Bogaerts et al (2013) found an association between psychological discomfort (levels of anxiety and depressed mood) in the first trimester and high gestational weight gain and postpartum weight retention in 39% (n=58) of 150 obese mothers in Belgium. It has been reported that the higher levels of potential and actual perinatal complications during pregnancy, combined with maternal characteristics more prevalent in obese women, such as lower levels of education, higher parity and being of another ethnicity (Bogaerts, Devlieger, et al. 2013), and the negative attitudes of caregivers (Furber & McGowan 2010) contribute to higher levels of anxiety and distress in obese pregnant women. What is not well understood is how the association between psychosocial factors and gestational weight gain occurs (Hill et al. 2013), although it is understood that pregnant women with elevated levels of stress and anxiety consume more unhealthy foods such as sweets and snacks (Hurley et al. 2005).

Women in my study described lifestyle or personal issues that took precedence over weight gain concerns, such as giving up smoking, or managing relationship difficulties. Although they were not asked directly about mood, it would be reasonable to suggest that

stress and anxiety played a part in their inability to sustain a positive attitude towards weight management during pregnancy, considering these simultaneous challenges. These findings point to the importance of incorporating strategies designed to provide psychological and social support, such as continuity of midwifery care and peer support into routine antenatal care.

### **Attitudes of the health professionals**

The women who participated in the intervention joined the groups by choice, and therefore could reasonably be predicted to hold a positive attitude towards weight management during pregnancy. In contrast, a number of the health professionals participated in the intervention simply by virtue of their workplace roles, for example the midwives working in the booking-in clinics. Some of these midwives demonstrated negative, at times almost hostile attitudes, both towards obese women, and towards providing gestational weight gain advice. On occasion, generalised comments made during interviews and focus groups by these participants implied beliefs that obese women are lazy, stupid and distasteful.

Negative attitudes towards obese people are pervasive and persistent in society and the existence of this form of discrimination is well supported by international literature. Almost 50 years ago, Cahnman (1968, p. 283) noted that obesity was viewed as a 'social disgrace'; more recently obesity has been described as 'the last socially acceptable prejudice' (Neporent 2013). Numerous studies continue to document harmful weight stereotypes; obese people are lazy, weak-willed, unsuccessful, unintelligent, lack self-discipline and are non-compliant with weight loss treatments (Brownell et al. 2005; Puhl & Brownell 2001). These stereotypes produce stigma, prejudice, and discrimination against obese people in social and organisational settings, including healthcare facilities. Bias is frequently reported by healthcare professionals such as doctors, nurses, medical students, dieticians and psychologists (Puhl & Heuer 2009).

Puhl and Heuer (2010) suggest that this form of stigma is rarely challenged, and is viewed by some as a necessary form of obesity control. This attitude was illustrated by one of the midwives in my study who queried the wisdom of providing groups for obese women, suggesting that the women should be '*shocked into doing something about themselves*', rather than be '*made comfortable*'. Obesity stigma creates significant difficulties in efforts to address weight issues and is a barrier to consumer access (Gudzune et al. 2014) and successful health interventions, as evidenced by my study. Overcoming negative attitudes in relation to obese women is an essential step in achieving change, suggesting the need for strategies to combat weight stigma for health professionals pre- and post-registration.

The findings of my study demonstrated that a number of maternity care professionals were reluctant to discuss weight and weight gain with women. In the Chapter 'Exploring the Evidence' of this thesis (Chapter 2) it was noted that there is an evidence-practice gap between what health professionals say they believe is important, and what they do in practice in relation to overweight and obesity. The findings of my study reveal some explanations for this behaviour in relation to attitude; perception of professional responsibility or role identity, and lack of confidence in the woman's ability to succeed.

Several participants in my study clearly articulated that advising women about weight and weight gain was not their job. Midwives in my study tended to consider this a specialist's job (such as a dietitian or doctor), whereas medical staff considered the issue too simplistic to be considered part of their responsibilities. Uncertainty in relation to professional responsibility for routine weight gain advice is a recurring theme in several qualitative studies both in Australia and overseas (Heslehurst et al. 2011; Stewart, Wallace & Allan 2012; van der Pligt et al. 2011; Wilkinson & Stapleton 2012). In line with the findings in my study, once a pathological diagnosis is confirmed such as gestational diabetes or hypertension, the literature suggests that both midwives and doctors are



more comfortable discussing the impact of weight, possibly because women are viewed as 'deserving' of the time and attention of a health professional (Mercer & Tessier 2001).

Many of the study participants revealed a lack of confidence in the woman's motivation or ability to succeed in terms of weight management during pregnancy, unless they themselves had experienced personal success. The relationship between personal success and positive attitude can be seen in relation to a study related to breastfeeding advice (Brodribb et al. 2008). This study of Australian General Practitioner (GP) registrars demonstrated that those with more than 52 weeks of cumulative personal (self or partner) breastfeeding experience had higher knowledge and positive attitude, and were more confident and effective, than those with less than 26 weeks experience. Positive attitude is therefore affected by positive personal experience, and this was clearly seen in my study where the midwives who had personal experience of gestational weight retention were more likely to prioritise a conversations about weight with obese pregnant women.

Conversely, negative experience is more likely to lead to negative attitude. Comments from midwives during the interviews such as *'it's like flogging a dead horse'* and *'everyone knows how to eat healthily, it is whether they choose to do it or not'* imply that some midwives felt there was little they could do to change the situation. This attitude is understood to stem from negative past experiences (personal or professional) and has been termed 'fatalism' by Davis et al (2008), permeating health providers' beliefs about the efficacy of weight management, and reducing patients' confidence in their own ability, thereby preventing success. Midwives have been reported as being frustrated by their perceived inability to make a difference (Chang et al. 2013; Schmied et al. 2011) but little is actually known about midwives' ability to motivate women to achieve a healthy weight during pregnancy. Midwives play an important role in the initial measurement and recording of BMI as part of general health screening at the booking-in appointment, but the outcome of their subsequent advice is not known.

Developments in the USA in terms of medical insurance may have the potential to change attitudes in Australia. In June 2013, the American Medical Association (AMA) officially recognised obesity as a disease. This is largely in response to the growing numbers of that population who are now obese, and to the recognition that obese people do not receive adequate support from health providers in terms of weight loss. Recompensing providers in the USA for their time and encouraging education in this area, similar to that for other forms of disease, is likely to bring about change for patients. Whether this trend will be followed in Australia, and what the impact could be for the maternity services is not clear.

Sustaining a behavioural intention relies not only on a positive attitude but also on normative and control beliefs; these are explored further in the next section.

### **Perceived norms**

In line with the Theory of Planned Behaviour, the study findings reveal influential beliefs that relate to perceived 'norms'; subjective, social and professional. In the context of the model, norms refer to the women's or health professionals' beliefs about whether peers or people of importance would approve or disapprove of their behaviour in relation to weight gain during pregnancy.

The wish to conform to perceived norms, or to the expectations of influential 'others', is strong. There is a large body of evidence demonstrating that people are heavily influenced by the actions and beliefs of others (Beaumeister & Leary 1995; Cialdini, Reno & Kallgren 1990; Moscovici 1985). The influence of subjective, social and professional norms on behavioural intention in terms of my study is explored below.

### **Perceived norms of the women**

Povey (2004) maintains that normative beliefs are an important component in motivating people to perform specific eating behaviours. Zwickert and Rieger (2014), in a qualitative study of 22 non-pregnant obese Australian women, found that an obese individual's social context strongly influenced the extent to which they engaged in positive weight control behaviours. This finding is closely aligned to that of my study: If the women in my study did not perceive that they had the support of friends and family, it was very difficult for them to engage fully in changes to their lifestyle. The women in my study reported how their children supported them in their efforts to eat more healthily, but other family members, such as partners and mothers or mothers-in-law, sometimes attempted to undermine their efforts. Similarly, in one study undertaken in the USA, Thornton et al (2015) noted that husbands and some female relatives were the primary sources of support and advice on weight, diet and physical activity-related beliefs and behaviours among pregnant and post-partum Latino women.

In Chapter 6 it was noted that women in my study referred to their weight gain goals as the 'midwife's goals', and set their own goals dependent on what they felt they could and should achieve, based on personal experiences and those of family and friends. All the women in my study were satisfied with their weight gain, irrespective of how much they gained, so it is conceivable that they did achieve their personal goals. This finding concurs with a recent randomised controlled trial by Brownfoot et al (2016) involving 782 women on one hospital site in Melbourne, Australia, to assess the influence of routine weighing in pregnancy. Of these women, 586 responded to a questionnaire to gauge satisfaction with weight gain during pregnancy. Similar to women in my study, all women in the trial were informed at booking of a target weight gain, based on the Institute of Medicine guidelines. In the intervention arm the women were weighed at each visit and in the control arm the women were weighed only at booking and at, or after, 36 weeks gestation.

The results of the study by Brownfoot et al demonstrated that there was no difference in weight gain between the groups, but women in both arms of the trial reported they were equally satisfied with their weight gain, despite the fact that 73% of the overall study population gained in excess of the guidelines. Approximately 20% believed that others influenced their weight gain, and this was predominantly family and friends encouraging weight gain. Only 2% of women in this trial felt that medical professionals influenced their weight gain during pregnancy. This is a very important finding as it suggests that weighing 'per se' will not have the desired outcome if official recommendations and women's personal expectations (influenced by her social context) are not aligned. This view is supported by McPhie et al (2015) who found that expectations of weight gain during pregnancy are a significant predictor of actual weight gain and suggest that interventions would benefit from targeting expectations, rather than ideals, regarding weight gain during pregnancy.

Normative beliefs also incorporate wider social norms, or customary codes of behaviour, in a group or a cultural context. The women in my study described the influence of social pressure in relation to eating and exercise during pregnancy; both in terms of widely held myths and cultural expectations. Society supports a relaxed attitude to weight gain and an increased social acceptance for overweight during pregnancy (Smith & Lavender 2011; Wiles 1998). These attitudes are often strongly supported by cultural beliefs around certain foods, and the notion that pregnancy generally confers permission to eat and rest (Newham et al. 2015). The women described these social norms as hard to resist, especially when living with in-laws and wider family members.

Family and friends therefore have a significant influence on women's decisions. Barberia et al (2008) suggest that there is minimal evidence in relation to the impact of health professionals' influence on patients who attempt to follow a healthier lifestyle. However, the findings of my study suggest that the approval and reassurance provided by the midwives in the groups had a very positive impact on the confidence of the women,

helping them to '*stay on track*'. One woman described how important it was to be told she was '*doing OK*' from the midwife, '*it was proof that I was doing it right*'. Gaining approval from health professionals generated reassurance and confidence, which in turn acted as positive reinforcement, encouraging the women to adopt new norms of behaviour and encouraging them to attend the groups regularly.

Social norms developed within the intervention groups, to some extent mitigating other influences. The support of peers within the antenatal group was reported by the women to be influential in helping to maintain new behaviours and skills; one woman described her peers as '*witnesses*' to her intention. The women reported that peer support created a positive feeling of strength and power, enabling some to resist social and family pressure. Sharing of experiences developed a supportive group culture, and new codes of group behaviour were reinforced regularly through group norms such as the sharing of healthy snacks.

### **Perceived norms of the health professionals**

In the context of the model, perceived norms refer to health professionals' beliefs about whether their colleagues or the women they cared for would approve or disapprove of their practice in relation to weight gain during pregnancy.

As mentioned previously, the wish to conform to perceived norms, or to the expectations of influential '*others*', is strong. Griskevicius et al (2006) define conformity as behavioural change designed to match or imitate the beliefs, expectations or behaviours of real or imagined others. Conformity is more likely to occur in times of uncertainty, or when individuals wish to be accepted in groups where attaining or maintaining status is important (Kenrick, Li & Butner 2003). The need for approval from professional colleagues is especially strong, especially in unfamiliar situations where an individual may initially feel unsure of his or her ability.

In line with this understanding, it appears that the intentions of health professionals are influenced by the norms of their professional group. In one study of over 600 dieticians, Chase et al (2003) demonstrated that the influence of professional peers was highly predictive of behaviour (professional practice) intention. The dieticians in this study believed that other health professionals would expect them (and approve of their intention) to promote whole grains. The dieticians' intention to do so was strong, but questioning revealed that the majority failed to enact the intended behaviour (promoting whole grains). The midwives in the booking clinics in my study demonstrated similar behaviour. In line with the views of midwives in published literature, they acknowledged that obesity and weight gain during pregnancy were important issues, but remained reluctant to provide advice within the context of the intervention. There is therefore some dichotomy between conformity to a professional norm (what is expected from the professional) and the individual's subjective norm (which may not be positive towards the expected behaviour).

Intention is therefore not solely predictive of behaviour; understanding the mechanism that translates intention into action is essential. Griskevicius et al (2006) describe two types of norm conformity which are both relevant to the behaviours noted in my study. Firstly, a type of accuracy-based conformity known as 'informational influence' employed by individuals who conform with the decision of others in unfamiliar situations, which was clearly demonstrated by the group facilitators in my study. The facilitators were unsure initially in relation to information that fell outside their professional sphere (the dieticians was unsure for example, of potential complications during labour related to obesity). However, motivation to meet the expectations of the women and the other facilitators was strong; Jill explained that *'in the groups we knew we would back each other up all the way'*. This outcome may provide a clue to positively influencing practice more widely, by encouraging health professionals to mimic others and adopt behaviours that promote healthy weight and weight gain.

Secondly, Griskevicius et al (2006) describe an approval-based conformity known as 'normative influence', where holding positive norms to behaviour that meets the expectations of important others, tends to produce liking. The psychology literature suggests that normative influence is particularly strong because individuals who deviate from any group are more likely to be viewed with suspicion or rejected (Griskevicius et al. 2006). The findings of my study suggest that it was important for the health professionals to conform to expected behaviours, in order to meet the expectations of both their professional group and their clients.

Midwives in this study expressed a reluctance to talk to women about weight gain in the belief that this caused unnecessary anxiety (psychological harm) during pregnancy. Marsha explained: *'you don't want them to know about weight gain really....it's just another source of worry..'*. This finding is replicated in other studies (Ellison & Holliday 1997; Stotland, Gilbert & Bogetz 2010), perhaps stemming from the innate desire of midwives to 'do no harm' in their interactions with women (Willcox et al. 2012). Evidence suggests however, that failure to acknowledge the issue of obesity and provide consistent, accurate advice is likely to be more anxiety-provoking for women (Ferrari et al. 2013). These findings suggest that the perceived role identity of health professionals, particularly midwives, should be questioned in line with the informational needs and contemporary expectations of women.

Some midwives in my study were unwilling to discuss weight with overweight women for fear of alienating them; maintaining their role as the woman's ally, not her enemy, was very important to their role identity. In Nicholl and Webb's review of research into 'what makes a good midwife', the personal attributes of a good midwife included being compassionate, kind, caring, and supportive to the woman (Nicholls & Webb 2006). Some of the midwives in my study felt that having to raise the issue of the woman's weight would come across as a criticism, in direct opposition to their perception of their midwifery role. Where the subject was too uncomfortable, some midwives described how

they used the communication tools provided, such as the coloured BMI charts and written resources to dissociate, or disconnect themselves from the issue. They did this by avoiding eye contact with the woman, or by referring to the issue as 'official' advice, effectively removing themselves from any possibility of personal connection or blame.

It is possible that midwives who find themselves in situations which challenge their role identity and in which they find they have little control, may resort to protective behaviours that effectively disengage them from the problem. The ability of the midwives in my study to disengage themselves from a potentially difficult encounter enabled them to fulfil a professional expectation whilst maintaining a positive subjective norm in line with their perception of their role and the women's expectations.

Understanding normative influences appears to be key to explaining why an evidence-practice gap exists between what health professionals say is important and what they do in practice. It seems that bringing the individual's beliefs (subjective norm) in line with their social and professional norms is all-important. In other words, when the individual is sufficiently convinced that friends, family, professional colleagues and clients approve of behaviour associated with actively managing weight gain during pregnancy, it is more likely to occur. However, to increase that likelihood, the individual must also have the belief that they are able to take action. Beliefs about control affect intention and are explored below.

### **Control beliefs**

Control beliefs are factors that facilitate or impede behavioural intention, and are related to the individual's perception of the ease or difficulty of performing the intended behaviour. According to the Theory of Planned Behaviour, perceived control is the extent of control an individual believes they have over their actions, in relation to their perception of environmental constraints (Ajzen 1991). Perceived control is similar to the concept of self-efficacy (Bandura 1991) which relates to the belief that an individual has in



relation to ability to perform a behaviour in the face of obstacles and challenges.

However, in the context of the Theory of Planned Behaviour, perceived control has the effect of moderating intention on behaviour. Self-efficacy is discussed later in this chapter in relation to ability and Social Learning Theory.

### **Control beliefs of the women**

The women in the study initially held the view that weight gain during pregnancy was inevitable and largely outside their control. This finding is in line with published research, which suggests that women who are pregnant generally perceive poor control over their body weight and shape (Fox & Yamaguchi 1997; Furness et al. 2011; Wiles 1998). These feelings are emphasised in women who are already overweight (Johnson, Burrows & Williamson 2004; Phelan, Phipps, et al. 2011); failed efforts at weight control in the past may underlie their reduced expectations, generating the ‘fear of failure’ noted in my study. Added to these considerations is that lack of control over weight during pregnancy appears to be largely condoned by society (Smith & Lavender 2011).

Control beliefs are related to the individual’s perception of the ease or difficulty of performing the intended behaviour. Control beliefs in my study did appear to present barriers to success for some women who participated in the intervention. In relation to goal setting for example, some of women complained that structured goal setting in the context of the intervention was ‘*too hard*’, and the lack of control they perceived over the goals was stressful.

If higher levels of perceived control do have a significant effect on behaviour performance, as the Theory of Planned Behaviour suggests, it is essential to understand more fully the determinants of control. Important lessons on what works to increase perceived control can be learned from the literature on weight loss in non-pregnant women. Feelings of lack of control are also common in non-pregnant women who are overweight and who have repeatedly tried to lose weight. Research suggests that strategies shown to be effective

for weight control outside pregnancy may also promote better weight control in pregnancy (Phelan, Jankovitz, et al. 2011).

Goal setting is a strategy commonly used in weight control outside pregnancy, and is well supported by literature (Brown et al. 2012; Phelan, Jankovitz, et al. 2011). In a systematic review of healthy lifestyle interventions incorporating goal setting strategies to prevent excessive gestational weight gain, Brown and colleagues found that overall, goal setting was effective. This strategy was not popular however, with women in my study and the strategy was identified in Chapter 7 as a 'negative case' or a mechanism that did not achieve the planned outcome of the intervention. The impact of goal setting in a group setting does not appear to have been explored in any published research, and it may be that it is simply not successful in this setting. Additionally, the inexperience of the intervention facilitators during the first ten months of operation, and their subsequent discomfort with these strategies may have been responsible for the woman's response. The review by Brown and colleagues concluded that engaging pregnant women who are overweight and obese is challenging and interventions may need to be more theoretically-designed to be successful. Interestingly, once the women in my study had had their babies they spontaneously talked about goals they had set themselves for the future, so possibly the pregnancy had prevented their focus from being elsewhere except on the baby, or that they perceived they had little control over their weight during pregnancy.

It appears that simple messages are more likely to be successful, especially during pregnancy which is in itself a time of considerable change. Gardner et al (2011) undertook a meta-analysis of lifestyle interventions that incorporated a number of required modifications. The results suggested that targeting multiple changes in behaviour concurrently may be unrealistic during pregnancy and ultimately prompt disengagement from the intervention.

Finding ways to increase perceived control (or 'make it seem easier') appears to be key to strengthening intention for weight management behaviour. van Genugten et al (2012) investigated the determinants of weight gain prevention by examining the journey from goal intention to successful weight management. Although the 510 participants in this study were not pregnant, there are important messages that could inform interventions in pregnancy. The authors found that perceived control was one of the most important determinants in the translation of intention to action. There was a common misconception amongst participants that 'huge' or 'extreme' changes were necessary to prevent weight gain, making the perceived investment in terms of effort too difficult for a considerable number of the participants. Helping people to match their goals with specific manageable strategies may therefore help to dispel these misconceptions and make the process feel easier. This may go some way to explaining why goal setting in groups was unsuccessful in my study, because the process must necessarily be based on individual needs and preferences.

### **Control beliefs of the health professionals**

The health professionals who participated in the intervention reported widely varying control beliefs; some perceived weight management practice as very hard and others as easy and enjoyable. The group facilitators for example, listed several enablers, such as professional freedom and increased autonomy that positively influenced their perception of control.

Conversely, the responses from the midwives in the antenatal clinics suggested that they felt they had very little control over the challenges posed by the introduction of weight gain discussions. They cited lack of time, knowledge, confidence and familiarity with the intervention as justification for their unwillingness to discuss the topic with women. The large number of negative responses from women further emphasised the perceived difficulties, which in turn decreased the midwives' beliefs that they could raise the subject

of women's weight without causing offence. This situation did not significantly improve over time.

In order to strengthen intention, individuals must believe that the required behaviour is manageable. Providing training, utilising modelling activities and ensuring feedback through mechanisms such as supervision where few opportunities exist for group support, are likely to increase confidence. Allowing additional time, providing support and practical tools for communication will all increase perceived control over the environmental factors (Oakland & Tanner 2007). These issues are closely related to increasing ability, through both skills and knowledge, and are described in more detail below.

This section has shown how the intention to perform a behaviour depends on the interaction of positive attitudes, subjective norms and control beliefs. In turn, the translation from intention to action also depends on ability, and this is explored below in terms of Social Learning Theory.

### **8.2.2 Ability (skills and knowledge)**

Ability in this context refers to the skills and knowledge that the women and health professionals gained in the weight management groups that enabled them to make changes to lifestyle or practice behaviour. Intention is important, but however strong intentions are, if they are not accompanied by the necessary skills and knowledge, change cannot occur (Berry 2004).

Social Learning Theory can be used as a tool to encourage behaviour change (Catling et al. 2015). Social Learning Theory embodies many learning constructs, which may be more or less predictive of behaviour, depending on the change intended. Relevant to this discussion are the following elements: **collective action, self-efficacy, observational learning and reinforcement.**

## **Collective action**

Social Learning Theory maintains that collective action can enable individuals to work together to achieve change that benefits the entire group (McAlister, Perry & Parcel 2008). According to Bandura (1995), this type of reciprocal interaction is particularly relevant to the promotion of public health initiatives, such as weight management, smoking cessation, and the promotion of health behaviours such as breastfeeding.

The ability to work together to achieve change was strikingly successful in my study, and without doubt, was a key factor in the success of the intervention. Women reported that participating in the group intervention provided them with a source of ‘strength and power’, which was positively associated with their ability to manage their weight gain and introduce healthier eating and activity behaviours. Many women reported that they were able to focus on achieving a healthier lifestyle because they sensed a feeling of acceptance and belonging that helped to empower them to change lifestyle behaviours. The positive experience of the group facilitators was described in the theme ‘the rewards of teamwork’ in Chapter 6, where they related being part of a supportive team to their ability to build skills, knowledge and confidence.

Surprisingly few programs addressing gestational weight gain have used a group approach to date (Claesson, Josefsson, et al. 2008; Guelinckx et al. 2010; Nascimento, Surita & Parpinelli 2011) despite evidence in relation to the popularity of group antenatal care (Catling et al. 2015; Teate et al. 2011). Many commercial weight loss programs for the non-pregnant population utilise ‘in-person’ groups as a motivational strategy. In a recent systematic review of the efficacy of commercial weight-loss programs Gudzone et al (2015) examined 45 studies, of which 39 were randomised controlled trials. The review concluded that participants of Weight Watchers, a program which utilises in-person group support, achieved at least 2.6% greater weight loss at 12 months than those participants assigned to the control or education-only. In their work on developing therapeutic groups for women who are obese, Buckroyd and Rother (2007) put forward a very strong case for

using social support as a means of reducing stress and decreasing the need to use food as a focus for comfort. These studies have important messages for future interventions developed to achieve similar goals.

## **Self-efficacy**

Self-efficacy relates to an individual's belief that the desired behavioural outcome can be produced; if this belief is not held, the individual has little reason to act (Bandura 1997). Self-efficacy is central to Social Learning Theory (Glanz, Rimer & Viswanath 2008), in a similar way to which control beliefs are central to the Theory of Planned Behaviour (Ajzen 1991). Within Social Learning Theory, self-efficacy regulates motivation and determines the goals and expected outcomes set by individuals.

Self-efficacy is of particular interest to my study, as the mechanisms of the intervention were originally designed to increase confidence in ability in both women and health professionals. In line with the original proposition that improving self-efficacy would enable behaviour change, this concept proved to be a critical determinant for both groups.

### **Self-efficacy of the women**

There is general consensus in the literature that intention to make a behaviour change is driven in large part by self-efficacy (Glanz, Rimer & Viswanath 2008; Mason & Butler 2010). Confidence, the primary construct in self-efficacy (Glanz, Rimer & Viswanath 2008) was a recurring mechanism noted in all interviews and focus groups in my study, playing an important part in the development of ability, illustrated by the theme 'staying on track'.

Hill et al (2013) maintain that most interventions aimed at preventing excessive weight gain during pregnancy are primarily focussed on physical activity and eating behaviours, neglecting other important psychological and socio-cultural factors. In order to address

this discrepancy, these authors propose a conceptual model, underpinned by health behaviour change theory, outlining the psychosocial determinants of excessive gestational weight gain, including poor confidence and low self-esteem. There are parallels between the concepts in this model and the findings of my study. For some women in my study, confidence was linked broadly to self-esteem; *‘when you feel good about yourself you can do anything’*. Self-esteem naturally rises through the satisfaction of achievement (McClelland 1961) and this was shown to occur in my study through a recurring CMO where women reported increasing confidence in relation to their ability to manage their weight gain, and in turn, managing their weight gain increased their confidence in other areas of their lives.

This finding is supported by Bandura’s work; strategies that build confidence, and ultimately develop self-efficacy, increase an individual’s ability to manage temptation and change eating and exercise habits in the long term (Bandura 1977). Managing challenging obstacles also requires problem solving skills for coping with low motivation, which might for example, be supported through strategies such as motivational interviewing (Robertson 2008). This would suggest that interventions focused on weight management should therefore aim to build confidence in a variety of fields, including those unrelated to weight management.

### **Self-efficacy of the health professionals**

In terms of health professionals, lack of self-efficacy was related to lack of knowledge (*‘feeling unprepared’*) and lack of skill in how to say the words (*‘the spiel’*). Once ability developed, health professionals seemed more likely to engage with some confidence. This finding is supported by the study by Chase and colleagues (2003) referred to previously, where over 600 dieticians had strong intentions to promote whole grain foods but few did so. It transpired that only 60% of the dieticians in this study were able to correctly identify a whole grain product from a food label, 21% could correctly identify current

recommendations and 42% of dietitians did not know there was a recommendation for whole grain consumption.

The results of the study by Chase et al suggest an evidence-practice gap similar to that identified in Chapter 2; maternity care providers in Queensland identified weight management as important, but only 32% were aware of the statewide clinical practice guideline for obesity a year after its introduction (Wilkinson & Stapleton 2012). In these cases, additional education and training for health professionals is needed to increase both knowledge and self-efficacy and potentially change practice.

### **Observational learning**

The importance of learning through the observation of others is central to Social Learning Theory (Glanz, Rimer & Viswanath 2008), and was key to the development of ability for the participants in my study. Observational learning (or modelling) is one of the most influential theories of learning and development (Baranowski, Perry & Parcel 1997), and is based on learning from watching other people. Observational learning offers elements of safety as others' reactions can be gauged before personally enacting the behaviour; a particular advantage to those who fear failure, such as some of the women in my study. These types of experiences are known alternatively as vicarious learning, the difference being that vicarious learning is learning through observing the consequences of others' actions.

Bandura (1977) was an advocate of group interventions: he maintained that being in a group situation enables participants to view others as they perform a successful new behaviour. Vicarious experiences, common with group support, are key to the development of self-efficacy and reinforce the belief that perseverance will lead to personal accomplishment. Simulated clinical learning now plays an important part in undergraduate clinical programs in Australia and internationally. In one Norwegian study (Thidemann & Soderhamn 2013), students were allocated to different roles within high-



fidelity simulated clinical scenarios. Three outcomes were measured; knowledge, satisfaction and self-confidence. The simulation was evaluated as a valuable teaching-learning method, and satisfaction and self-confidence were scored highly by the participants.

Observational learning also strengthens normative behaviour, as individuals learn skills from their peers and adopt the behaviour of others in order to be accepted by social and professional groups (Gryczynski & Ward 2011). The model of Gestational Weight Management Behaviour Prediction acknowledges the importance of both these concepts in triggering positive weight management behaviour. Intervention strategies should therefore utilise this knowledge by encouraging positive modelling activities and opportunities in the workplace.

Women in my study reported that they gained knowledge and learned new behaviours (both parenting and weight management behaviours) through peer modelling; listening to each other's stories and watching how other women resolved difficulties similar to theirs. According to Social Learning Theory, individuals are more motivated to imitate behaviour from people who they perceive to be similar to themselves (Bandura 1986). In line with this statement, women in my study commented on the strength they drew from being part of a group of women *'in the same boat'*.

The effect of observational learning on professional ability in my study was striking. Two very different experiences demonstrated the influence of vicarious learning and the effectiveness of behaviour modelling strategies. The health professionals who facilitated the groups reported the positive effects of working as a team and learning from consistently observing each other's practice, whereas the midwives who worked alone did not report a gain in skills or knowledge. In fact these midwives noted a decrease in self-confidence, and the situation was identified as creating a 'negative feedback loop' in Chapter 7. It is likely from this evidence that communication skills, especially those

required for sensitive issues such as weight management, are best learnt through participation in modelling activities, whether this is by watching role plays (live simulated interactions, or through the use of audio visual tools), through working in groups, or alongside a mentor or 'buddy' in the real world.

## **Reinforcement**

The ability of reinforcement to affect behaviour change was a very strong finding in my study, expressed as the themes 'regular reinforcement' in relation to the women, and 'making a difference' from the perspective of the facilitators. According to Social Learning Theory, positive or negative behaviour can be modified through reinforcement, intrinsically (internal factors such as a feeling of pride or rejection) or extrinsically (external factors such as reward or punishment).

Women who are obese are often subject to negative reinforcement through the actions of individuals, health professionals, and society as a whole (Brownell et al. 2005; Merrill & Grassley 2008), which can effectively reduce their willingness to participate in lifestyle change. In my study findings the women noted that regular positive reinforcement, in the form of a reward (encouragement and approval) from significant others such as family, the midwifery facilitators or the other women in the antenatal group, played an important part in motivating them to change and maintain new behaviours.

In Chapter 7 positive reinforcement was highlighted as an example of a positive feedback loop, where even in the face of initial lack of self-efficacy (the context), positive reinforcement from both midwives and women (the mechanism) encouraged regular attendance at the groups (the planned outcome) which reinforced the effect and created an increased willingness by the women to participate further.

The health professionals who facilitated the groups reported that the positive feedback they gained through the women's achievements also reinforced the value of their work.

The health professionals became aware of their ability to effect change which was professionally rewarding, and encouraged them to continue to improve their facilitation skills. In contrast, the midwives who were seeing women alone in the booking clinics largely received negative reinforcement, which decreased their desire to repeat the behaviour.

Behaviours are products of learning experiences (Mazur 2013) and much behaviour is habitual, reinforced over time through learned responses. Habits are strong predictors of behaviour which may prove to be barriers, over-riding intention as a determinant of behaviour change (Montaño & Kasprzyk 2008). Eating habits for example, are notoriously resistant to change; they are formed early in childhood and reinforced through a combination of cultural, familial, emotional and social influences (Buckroyd & Rother 2007).

Habitual behaviour in professional practice may also present constraints; midwives in my study described how they had a habitual 'spiel' for lifestyle advice at booking appointments into which they found it difficult to incorporate weight management information. Developing a new habitual weight management spiel took time, practice and confidence, underpinned by knowledge and effective communication skills, and was adopted when it was judged to be least offensive to women and effective in practice.

Understanding the power of reinforcement is a major factor in achieving behaviour change and literature regarding workplace behaviour offers practical strategies. The literature suggests that interventions designed to achieve behaviour change should seek to understand habitual 'triggers' for behaviour and support the adoption of new habits through a variety of positive reinforcement strategies (Makin & Cox 2004). This is an important consideration for future weight management interventions.

### **8.2.3 Opportunities (environmental)**

‘Opportunity’ in this context relates to environmental barriers or enablers for behaviour change (Montaño & Kasprzyk 2008). During the data collection process of my study, both women and health professionals described practical considerations that presented barriers or enablers to engagement. Women identified work commitments, transport, time, and childcare as factors that influenced how hard or how easy it was for them to engage in weight management behaviour.

The influence of family has been discussed in relation to the development of codes of behaviour (norms), but women also noted that the physical presence of significant others was helpful; to encourage a walk in the evenings or help with shopping and cooking. Conversely, the physical presence of family members could also pose constraints; this was noted in Location A, where several women were living with in-laws, where they often had no influence over family meals.

Support from the woman’s partner may also act as an enabler or a constraint; women in my study with relationship difficulties found it difficult to focus on their own needs such as weight management. In a study by Thornton et al (2015) of pregnant Latino women’s weight, diet and physical activity beliefs and practices, informational and emotional support provided by husbands was reported as the most important and consistent influence on over- or under-eating during pregnancy. The intervention did not actively encourage the involvement of family in its structural design, although the findings suggested that family (including the women’s children) and friends conveyed a strong influence over eating and exercise routines during pregnancy. This influence should inform the design of any future weight management intervention.

In a similar way to the women, the health professionals working as facilitators in the groups needed the support of a cohesive clinical team. Obese pregnant women are more likely than pregnant women of normal weight to develop complications during pregnancy,

and may require subsequent obstetric consultation and referral. Support from a cohesive team includes both virtual support in terms of access to women's clinical records and results, and rapid access to advice and consultation. Without the support of a cohesive clinical team, achieving sustainable change in relation to consistent advice and management and the provision of safe care, was almost impossible for health professionals.

The health professionals overwhelmingly identified time as a major barrier to incorporating weight management advice into their practice, alongside staffing and organisational challenges. The midwives responsible for undertaking booking appointments with women reported that as weight management was not on the 'tick list' of items to be discussed at booking, there was little opportunity (and no official imperative) to do so. The lack of clinical protocol can therefore act as an environmental constraint in this context. Miller et al (2014) maintain that the lack of systematic advice and support regarding women's weight and lifestyle behaviours during the child bearing years in Australia is an outstanding 'missed opportunity', and recommend clinical guidelines for maternal weight management for the perinatal years, training and support of health professionals to develop skills and confidence in raising weight issues with women, and a variety of maternal weight management programs. Although the context of the paper is wider than pregnancy, the systematic failing to tackle the issue of maternal obesity with any clear of consistent direction across Australia is well made.

A number of the environmental opportunities for engagement in my study were identified as key contextual factors that helped to explain the variable intervention outcomes. These factors should be taken into consideration in the design phase of a similar intervention at another location. Stakeholder engagement during the planning phase of the intervention would enable many of these practical considerations to be identified and managed prior to implementation. Early stakeholder engagement did not occur in my study and this issue is discussed as a limitation in Chapter 9.

#### **8.2.4 Section summary**

This section has discussed the findings of the study in relation to the application of the model of *Gestational Weight Management Behaviour Prediction*, using the two middle range theories as a framework for the discussion. The findings of the study suggest that strong intention predicts action, but is reliant on positive attitude, the influence and approval of 'significant others' and the degree of control perceived by the individual. Society's influence on these factors is strong, combining with personal experience to influence how individuals view overweight and obesity, and whether they are able to prioritise healthy weight gain in pregnancy amongst other social determinants of health. Women may receive conflicting messages from health professionals who are knowledgeable about weight gain and otherwise supportive, but are reluctant to broach the topic.

Ability is central to turning intention into action but it relies on confidence, self-esteem, positive role modelling and regular reinforcement of new behaviours. Practical considerations such as time, transport and childcare are important and need to be taken into account at the outset of any intervention, to enable and sustain engagement.

The next section considers what lessons have been learnt through the realist evaluation of the intervention, in terms of both future practice and research.

### **8.3 Pulling it all together – or where to from here?**

The aim of realist evaluation is to highlight the mechanisms acting as enablers or barriers to behaviour in the context of the intervention, generating 'transferable lessons' of interest to others (Pawson & Tilley 1997). This section presents implications for practice and research, based on these transferable lessons.

### **8.3.1 Implications for practice**

This section considers ten key features that have emerged as a result of the realist evaluation of the intervention. These features, or components of the intervention, should be incorporated wherever possible in the structure of similar group-based interventions designed to assist women to achieve a healthy weight gain during pregnancy. The key features listed here are related to those mechanisms in the refined configurations which were identified as recurring CMOs or those that played a part in the positive feedback loops. Their association with positive weight management behaviour in the intervention suggests that these mechanisms are critical to increasing the intention and ability of individuals to engage with the intervention, and their opportunity to do so.

Brug et al (2005) maintain that the theories unpinning the model can only assist in finding out what needs to be modified to bring about behaviour change, not how. The complexity of gestational weight management is such that there can be no hard or fast statements about 'what works', but some broad understanding (the transferable lessons) about what *tends* to work, for whom and in which circumstances (Best et al. 2012). Specific strategies (tangible mechanisms) have therefore not been specified within the list below, because these will depend on the local context wherever the intervention is introduced.

#### **Key features that should be incorporated in the structure of group antenatal care interventions designed to support obese women to achieve a healthy weight gain during pregnancy**

##### **1. Health professionals are engaged in the development and implementation of the intervention**

The findings of this study demonstrated that the engagement of health professionals was key to successful implementation and sustainability of the intervention. Health professionals are in an influential position to stress the importance of healthy weight gain and refer women into the intervention, and so are crucial to its success. Health

professionals must however, be convinced of the importance of the issue and recognise weight management as integral to their role.

**2. Clinicians are provided with support to develop effective communication skills**

In line with published evidence, a number of clinicians in this study rated their communication skills poorly, and their negative interactions with women further eroded their confidence. Those who were older and working in the one area of practice rated their confidence lowest. Evidence demonstrates that engaging women in weight management interventions is extremely challenging and clinicians require intensive preparation and support to do so. Improving the communication skills of clinicians who provide maternity care to women has the potential to improve their confidence and the efficacy of their conversations with women about weight and weight gain.

**3. Women are offered the intervention via a personal approach**

The findings of the study demonstrated that perceiving the intervention as personally relevant was more likely to achieve initial 'buy-in' from women, and was critical to successful engagement with the intervention. In this study, young, primiparous women were difficult to engage, and therefore particular strategies may need to be employed to attract this group of women. A personal approach to a woman from a midwife (either face to face or by phone) appears to create a state of psychological readiness or optimistic mindset in women. This was all-important in setting the tone of the engagement with the intervention and in creating motivation to manage weight gain successfully.

**4. Opportunities for peer support are provided at each group**

The findings of the study demonstrated that peer support was critical in providing the women with a sense of acceptance, confidence, strength and willpower. The support of other women in a similar situation enabled learning, provided social support, and reinforced positive behavior. Based on these findings, peer support may also have the



potential to lower stress and anxiety in women who are obese and help to support healthier eating habits.

**5. Vicarious learning is utilised wherever possible to effect behaviour change**

The findings demonstrated that wherever women or health professionals observed the positive experience of others (irrespective of where this took place) knowledge, skills and confidence were gained through vicarious learning. Evidence demonstrates that effective weight management behaviour or practice change is complex, and difficult to accomplish and sustain. Vicarious learning that offers opportunities for behaviour modelling appears to be the most effective method of skills acquisition for effective weight management.

**6. Continuity of midwifery carer is integral to the intervention group model**

The benefits to women of midwifery continuity of carer are well documented in the literature. The intervention provided continuity of carer by the same two midwives at each visit, which was well evaluated by the women. Women particularly valued the positive relationships they built with these midwives, which provided them with a sense of unconditional acceptance and feelings of safety. Once psychosocial needs are met, 'readiness' to engage with weight management strategies is more likely to occur.

**7. Family involvement is encouraged**

Evidence demonstrates that women's choices and decisions in relation to eating, activity and weight gain during pregnancy are largely influenced by their family and friends. Families and significant others (often due to societal or cultural beliefs) may sabotage women's attempts to eat healthily and exercise during pregnancy. Conversely they have the ability to provide positive reinforcement and promote confidence, once convinced of the benefit to mother and baby. The involvement of families or significant others is therefore key to helping women make and sustain healthy lifestyle change.

**8. A responsive clinical network to ensure effective consultation and referral is integral to the structure of the intervention**

Women who are obese are more likely than women of normal weight to experience complications during pregnancy. Sustainability of the intervention relies on the ability to provide safe and responsive care, enabled through well-designed local referral pathways, collaborative working and effective communication between care providers. Strong clinical leadership from a named obstetrician is important to ensure consistent decision-making.

**9. The intervention groups are accessible, convenient and flexible**

The venue for the intervention must be accessible; both to health professionals and to women, to promote attendance and maximise use of time and resources. The time taken to collect and return notes and equipment to offsite venues, and for health professionals to attend for outreach visits, is a significant factor in sustainability. The time/day of the intervention groups should be flexible, to meet the needs of a variety of participants and their families, and the venue should be conveniently situated near transport links.

**10. Opportunities are actively sought to raise the profile of the intervention**

Local 'ownership' of the intervention results in a sense of value. When the intervention is valued as a flagship service influential stakeholders and/or sponsors are more likely to go to greater lengths to promote sustainability (through staffing initiatives, further training and ongoing support measures for example).

These individual features appear deceptively simple. Based on the findings of my study however, together they have the ability to bring about behaviour change in relation to gestational weight management. Returning to the previous note of caution about a 'broad understanding' about what tends to work; in a local context these factors are likely to play out differently, affecting behaviour (and thereby contributing to change) through a wide range of alternative mechanisms.

### 8.3.2 Future research potential

The described model of *Gestational Weight Management Behaviour Prediction* is intended to expose the determinants of behaviour insufficiently addressed by the current intervention, which may be presenting barriers, or blocking mechanisms for change. Modifications to these factors may subsequently result in more effective interventions. Several ‘rounds’ of refinement are recommended for a realist evaluation (Pawson & Tilley 1997, p. 282) but are outside the scope of this thesis. However, the model as described provides an opportunity for other researchers to test another iteration of the intervention.

There is an opportunity for future research into the determinants of behaviour that appear to have the greatest influence on predicting weight management behaviour. Given the strength of society’s influence on women, the greatest gains are possibly to be made in strengthening the intentions of health professionals in relation to supporting women with weight management. Research into the underlying attitudes and normative beliefs of health professionals would support this work, as there is clear published evidence of the need to improve the knowledge, skills, and confidence of health professionals in this area.

A sample of research questions that remain to be answered include:

- What factors influence the evidence-practice gap in relation to health professionals’ intention to support weight management?
- What mechanism is active when intention to provide advice in relation to obesity and weight gain in pregnancy translates into action? How can this mechanism be strengthened so that a ‘tipping point’ is reached and the practice becomes routine?
- Normative influence is a strong predictor of behavior. What normative beliefs influence professional practice in relation to weight management support?
- Is goal setting, facilitated by health professionals who are trained and confident in motivational interviewing skills, an effective strategy in group-based care?

## 8.4 Chapter summary

This chapter has discussed the findings of my study within the context of published research, in relation to the *Model of Gestational Weight Management Behaviour Prediction*, adapted from the *Integrative model of Behavior Prediction*. The model incorporates two middle range theories: the Theory of Planned Behaviour and aspects of the Social Learning (cognitive) Theory.

In the final section of this chapter, transferable lessons have been presented in the guise of ten key features necessary for the successful development and implementation of a similar complex intervention elsewhere that focuses on women's weight gain in pregnancy. These key features are related to those mechanisms in the refined configurations which are central to increasing the intention and ability of individuals to engage with the intervention, and their opportunity to do so. Finally, future potential for research in this field has been highlighted, based on lessons learnt.

The final chapter presents my experience of using the realist evaluation methodology to explore the reality of what worked for whom, and in which circumstances, in relation to an intervention designed to support obese women to achieve a healthy weight gain during pregnancy as part of routine antenatal care.

# CHAPTER 9 - USING REALIST EVALUATION IN THE REAL WORLD

*Realist evaluation assumes both that social systems and structures are ‘real’ (because they have real effects) and also that human actors respond differently to interventions in different circumstances (Greenhalgh et al. 2015, p. 2)*

## 9.1 Introduction

Realist evaluation aims to provide evidence about how things are in the ‘real’ world. Such real world research attempts to explain how and why people respond differently to the same resources and opportunities, and is increasingly important in today’s world, as the need to justify what is funded and delivered becomes ever more pressing. This final chapter describes my experience of using the realist evaluation methodology to explore the reality of what worked for whom, and in which circumstances, in relation to an intervention designed to support obese women to achieve a healthy weight gain during pregnancy, as part of routine antenatal care. The strengths and challenges of the methodology are discussed in relation to my own and other researchers’ experiences, the wider limitations of my study are described, and recommendations made for the future potential of the methodology.

## 9.2 Methodological challenges

Realist evaluation is a relatively recent approach, especially in health systems and services research. As has been described in Chapter 3, the purpose of realist evaluation is to explore and develop theories of how and why complex evaluations work. As such, the methodology offers an attractive option to those looking for answers to some of the ‘wicked problems’ of health services research (Greenhalgh et al. 2015, p. 1), that necessitate complex interventions with multiple interrelated components.

There are methodological challenges however, associated with realist evaluation. There are many time consuming steps involved in the process, causing the methodology to be labour and resource-intensive (Mark & Julnes 1998). There are no simple steps or strict methodological rules to follow, or standardised approaches to take (Byng, Norman & Redfern 2005), making the process intellectually challenging (Pawson & Tilley 2004) but equally rich in opportunities. The methodology is interpretive, seeking to explain why the intervention works in some situations but not in others, but is ultimately dependent on the ability of the study to test sets of propositions based on the CMO configurations (Tolson & Schofield 2012).

This methodology may have been an ambitious choice for a PhD thesis. In support of my choice, the freedom provided by the lack of 'strict rules' meant that it was possible to be innovative at each stage of the research, a key feature of the methodology noted by Salter and Kothari (2014). I was able, often by trial and error, to develop a process at each step that I considered was most likely to achieve the aims of the study, whilst striving to remain true to the essence of the methodology. Rycroft-Malone et al (2010, p. 11) relate their similar experience with realist evaluation to 'feeling part of a natural experiment'. There is also no doubt that it was a time consuming and labour-intensive process, but one that ultimately reaped rewards.

The following section describes the various operational challenges I experienced whilst using the methodology, critically analyses the decisions that were made and provides some justification for the approaches that were subsequently taken. I have highlighted four particular issues for this discussion; developing initial theory, the issue of timing for data collection, the meaning of mechanisms and the testing of the CMO configurations.

### **9.2.1 Initial theory: getting the context right**

Context is all important in realist evaluation, because in order to monitor change it is essential to understand the situation at the outset. Establishing those issues and linking them to existing middle range theory in order to develop strategies that are designed to lead to planned outcomes is one of the major challenges of realist evaluation (Salter & Kothari 2014), and one that I experienced in my own study.

Doi et al (2015) maintain that the initial theory that underpins the CMO configurations may be derived , inductively, deductively, or formulated from stakeholders' mental models. Inductive theory is developed from information on how an intervention is actually working, based on observation. Deductive development involves deriving initial theory from a review of the research literature on how an intervention is supposed to work. Developing theory from stakeholders' mental models involves understanding how they anticipate the intervention will work. Funnell and Rogers (2011) suggest that meaningful theory should involve a mixture of all three elements.

As was described in Chapter 4, I was unable to employ inductive development of initial theory for my study because no other models of group care incorporating weight management during pregnancy were known to exist at that time. The initial theory in my study was necessarily developed deductively from the research literature related to theory-based lifestyle interventions (Fishbein & Yzer 2003), although it has been suggested that the long-term impact of theory-based interventions is ambiguous (Bélanger-Gravel et al. 2011). Studies designed to prevent excessive gestational weight gain have demonstrated that changes in dietary and physical activity can result in lower gestational weight gain, but acknowledge that the mechanism by which this occurs is not always clear. Differences in intervention design, content, delivery and evaluation, combined with under-reporting of interventions and failure to evaluate behaviour change, mean that the 'active intervention ingredients' are very hard to define (Gardner et al. 2011).

The lack of conclusive evidence to support the identification of appropriate initial theory posed a significant challenge to my study because it cast potential doubt over the accuracy of the conjectured CMO configurations. Insufficient evidence to support initial theory has also been experienced by other researchers (Goicolea et al. 2013; Rycroft-Malone et al. 2010) who have published studies using realist evaluation. These authors resorted to using evidence indirectly related to the issue, and combining this with either stakeholder interviews or the use of other data sources at the theory development phase.

If time had allowed, contact with stakeholders in my study at locations A and B would have assisted with a deeper understanding of local context (such as lack of experience with group-based care at Location B) and the development of more appropriate local strategies. Although the initial driver to develop a non-medicalised model of care for women who were obese originated from local user dissatisfaction, it was the results of local audit that stimulated the development of the intervention aimed at achieving weight management through lifestyle change. These drivers could not be considered to be 'stakeholder mental models' of how the intervention was anticipated to work, although there was enthusiasm from local clinicians and managers to further utilise experience with group-based antenatal care.

The middle range theory of self-efficacy that was adopted as the initial theory for my study was based on an investigation of what works in the non-pregnant population in relation to weight management (Mitchie et al. 2008; Schwarzer & Fuchs 1995). Strategies that work with non-pregnant women are focussed on increasing self-efficacy, for example through goal-setting, intensive support and bringing women together in groups. At the outset of my study however, this was 'unknown territory' in terms of pregnant women. In contrast, the theory of self-efficacy was chosen with confidence for maternity care providers, as this was based on strong evidence that maternity care providers lack self-



efficacy in relation to broaching the subject of weight and weight gain, as described in the evidence review in Chapter 2.

Despite having little direct evidence to support the choice of initial theory, the resulting middle range theory of gestational weight management prediction, described in Chapter 7, clearly shows that the initial choice of self-efficacy was certainly simplistic, but not altogether inaccurate. Analysis of the data demonstrated that confidence, the primary construct in self-efficacy (Glanz, Rimer & Viswanath 2008) was a recurring topic in all interviews and focus groups. A column has been added to the refined CMO grid to reflect the local context that was identified during the evaluation phase, to assist understanding of the outcomes that differed at each location.

### **9.2.2 The issue of timing – and time**

‘When to evaluate?’ is a critical issue for any evaluation study. Evaluations of interventions involving issues high on the political agenda such as obesity will attract attention, but there is also pressure to deliver, and quickly. In common with other researchers (Tolson & Schofield 2012), the timing of the evaluation of my study was imposed by the funding body, and as described in Chapter 5, took place during the first ten months of the introduction of the intervention.

During the first phase of my analysis I used a pre-determined set of codes (positive, negative and unexpected), according to the original hypotheses, to prepare the qualitative data for the purpose of integration. The coding process provided an efficient method of analysing the responses from the participants, but raised questions for me about the large number of ‘negative’ and ‘unexpected’ responses where the planned outcomes did not occur, especially in relation to the perspectives of the maternity care providers. Critical realism philosophy maintains that the way the participants perceive reality will depend on their personal frame of reference, which may feasibly change over time. The outcomes of a study may then be affected by the timing of the data collection. The large number of

negative responses, particularly in relation to the development of confidence, may have occurred because the intervention had only been in operation for a relatively short time, reflecting the critical issue of timing that is common to many evaluation studies.

Several rounds of evaluation to achieve 'responsive refinement, enlightenment and continual betterment' (Pawson & Tilley 1997, p. 282) are recommended for a realist evaluation. Lack of time and resources unfortunately precluded this option for my study. If time had allowed, another round of interviews at a later stage when the intervention had been in operation for a greater length of time, may (or may not) have elicited different responses from practitioners who were more comfortable and experienced with the intervention resources.

Rycroft-Malone et al (2010), in common with many other researchers, also only managed one round of evaluation in a realistic evaluation of protocol-based healthcare. These authors describe realist evaluation as providing 'explanatory beginnings', which would seem a reasonable assessment of what was achieved. This statement recognises the limitations of realist evaluation as a largely interpretive methodology, whilst being appreciative of its ability to provide a depth of understanding that more deductive approaches cannot do. As I also only managed one round of evaluation, the limitations imposed by the timing of the qualitative data collection should be taken into account when considering the findings of my study.

### **9.2.3 The meaning of mechanisms**

One of the strengths of realist evaluation lies in its explanatory power and potential to uncover why interventions work sometimes but not in all situations (Tolson & Schofield 2012). The identification of the mechanisms is key to this process. However, mechanisms present a particular challenge in realist evaluation – how to define them, where to locate them, how to identify them and how to test and refine them (Dalkin et al. 2015). In

relation to my own study, determining these important issues was central to my understanding and use of the methodology.

In a review of methodological problems associated with realist evaluation, Marchal et al (2012) note diverging views regarding the nature of mechanisms. In their original work, Pawson and Tilley (1997) claim that mechanisms are theories of behaviour and inter-relationships that are responsible for the change. In contrast, Evans and Killoran (2000) define mechanisms as including the activities integral to the interventions; tangible strategies that are introduced deliberately to bring about change, similar to those in an implementation logic model. Weiss (1997) disputes this definition, maintaining that mechanisms are not the intervention strategies, but the responses of the participants to these, therefore lying between the strategies and the outcomes.

When I initially designed the conjectured CMO configurations, or the theories of what would work in the weight management intervention, I followed Evan and Killoran's logic and defined the intervention strategies as mechanisms. It was not until the analysis phase of my study, when examining the findings, that I came to understand that mechanisms are both tangible and intangible. At this point I returned to the literature to read the debate raised by Dalkin et al (2015), as described in Chapter 7 'Refinement of the Conjectured CMO Configurations'. Dalkin and colleagues (2015) term tangible mechanisms 'resources' that are aligned with context, as they are the components of an intervention designed to bring about change. Intangible mechanisms are the responses of the participants, termed 'reasoning'. These authors proposed a refined formula, resonating with my own findings, to explain how these two types of mechanisms exist within a refined CMO:

$$\mathbf{M} \text{ (Resources)} + \mathbf{C} \text{ (Context)} \implies \mathbf{M} \text{ (Reasoning)} = \mathbf{O} \text{ (planned or unplanned Outcome)}$$

The revised formula was subsequently adopted in the refined CMO configurations of my study (Appendix 8). The use of this formula is one of the strengths of my study. It is an innovative approach, based on the work of Dalkin and colleagues, to explain how a

mechanism can be both a resource and a response. Resources (strategies) are often tied closely to context, and it can be difficult to distinguish one from another. An example of this issue in my study was fear of damaging the relationship with a woman by raising the subject of her weight (context), the provision of communication tools to support health professionals to have conversations about weight and weight gain (intended as a resource mechanism) and dissociation with weight gain advice (surfaced during analysis as a reasoning mechanism), leading to the planned outcome of maintaining a positive relationship with the woman. This approach helps to differentiate between an intervention resource (strategy) and the participants' reason(ing) to engage, which will ultimately determine the outcome.

#### **9.2.4 Testing the CMO configurations**

The ability to explain why people act as they do with the resources that are provided, the CMO configurations (or theories of how people will act) must to be adequately tested during the realist evaluation process. Having developed an explanation for tangible and intangible mechanisms and mapped these onto the refined CMO grid, I then encountered two further 'mechanism issues'. Firstly, more than one mechanism appeared to be working in some cases to effect the change associated with the outcomes; the influence of family, the fear of failure and the development of confidence all appeared for example, to contribute positively or negatively to weight management during pregnancy. Secondly, the activation and strength of the mechanism depended on the context of each participant. How these issues were managed in my study is described below.

The CMO configuration is used as an analytical tool to analyse the data and surface the mechanism. Pawson and Manzano-Santaella (2012) maintain that it is common to surface many ways (mechanisms) by which the intervention may work, transforming CMO configurations in some cases to CMO 'catalogues', vastly increasing the complexity of the findings. To contain this situation, it is important to formalise outcomes as far as possible

in the initial hypotheses so that they are easier to test. Testing involves searching for explanations, not simply finding correlations (Pawson & Manzano-Santaella 2012).

A potential weakness of my study is the testing of the original theory (Self-Efficacy). In the face of so many mechanisms working to effect change, I could not with any confidence determine which particular mechanism was more responsible than another for the outcome of interest. Had I defined the planned outcomes more specifically at the outset within the original CMO configurations, and initiated before-and-after assessments of change, I might have been able to provide stronger explanations for the outcomes. In retrospect I could perhaps have asked the participants to rate their self-efficacy using a validated tool, or more simply by asking the participants to demonstrate increased self-efficacy by providing lifestyle or clinical practice examples.

Lack of formal assessment has been noted in several published realist studies. In a recent review of realist studies, Salter and Kothari (2014) commented that none of the studies they reviewed contained well-defined outcomes or indications of assessment. The authors note that to formally assess, potentially on several occasions, is resource intensive which may reasonably account for this omission. In my own case, the design of my original CMO configurations was hampered at that time (in 2010) by lack of clear-cut guidance for realist evaluation and the fact that I was a novice user of the methodology. To compensate for this omission, I have concentrated on the identification of outcome patterns; recurring CMOs and negative cases as potential explanations, and the incorporation of these within the subsequent middle range theory model for predicting gestational weight management behaviour within the intervention.

The second issue I encountered when testing the CMOs was the activation and strength of the mechanism being dependent on the context of the individual. Pawson and Manzano-Santaella caution that in all interventions there must necessarily be winners and losers, not just winners. In other words, some strategies will work for some people and not

others. There will also be subsets of the winners and losers; some will win or lose, more or less, than others. In realist terms, the outcomes will be graduated according to the participants' responses to the intervention. In line with the philosophy of realism, context (in this case, the way the person sees the world) is difficult to disentangle from the mechanism of an intervention, as it will always have a bearing on outcomes.

in Chapter 7 'Refinement of the CMO Configurations' it was noted that mechanism 'triggering' does not always occur to different individuals at the same intensity, especially where interpersonal relationships between stakeholders are an integral part of the intervention (Pawson 2006a). Returning to my data I recognised that an experience of 'triggering' had been described by one of the midwives in my study. The midwife was talking about the relationships within the group; *'it works when it gels, when you have energy in the room'*, but what she was in fact reflecting was the actual triggering of an enablement mechanism. The ability of positive relationships to trigger strong mechanisms is noted as an opportunity for change in the subsequent middle range theory model for predicting gestational weight management behaviour.

The operational challenges associated with realist evaluation in relation to initial theory, the timing of the data collection, the meaning of mechanisms and the testing of the CMO configurations have been described in some detail in this section. The next section considers the strengths and limitations of my study, and future potential for realist evaluation in the world of health services research.

### **9.3 Strengths and limitations of my study**

The study I have undertaken is unique in its use of realist evaluation to generate an accumulation of insights into what made an intervention work, for whom and in which circumstances, in relation to gestational weight management behaviour. It does not however, deliver definitive results. Realist evaluation is not intended to provide a

complete explanation of possible patterns or outcomes or generalisable findings of what works for whom and in which circumstances (Salter & Kothari 2014). The strength of the methodology however, lies in its ability to provide a depth of understanding that more deductive approaches cannot do, through the generation of theory.

In relation to the use of the methodology, the limitations of my study include a number of factors such as the lack of conclusive evidence to build initial theory, the undertaking of only one round of evaluation and the omission of before-and-after assessments for testing the CMO configurations. These limitations have been explored in earlier parts of this chapter. The strengths of the study include the adherence to the realist interview technique and the design of the sequential analysis framework.

The realist interview technique enabled a respectful partnership relationship to be established with the participants which is similar to that of a midwife and the women for whom she is providing care, and so was familiar to me. The partnership takes time to be established though, so was more difficult with busy clinicians and in focus groups where participants were more easily distracted. The analysis framework was developed through trial and error, after several false starts, but I am confident that it does provide answers to the study questions. Once the hypothesis codes had been determined I was able to integrate the qualitative and quantitative data to answer ‘what works’ and ‘for whom’ questions through a comparative analysis process. The thematic analysis sequentially built on this process and was intended to identify the mechanisms that were active in some circumstances and not in others. This phase however, raised more questions for me as the researcher, and as mentioned in the ‘Methodological challenges’ section (Section 9.2 within this chapter), a limitation remains the one round of evaluation.

Additional limitations of my study stemmed from practical problems associated with doing ‘real world’ research. Organisational change, such as the move to a paperless system at Location B, was introduced prior to the installation of network access in the community

clinic. This system subsequently changed the context of the intervention, compromised the safe delivery of care, and eventuated in unplanned outcomes at that location. It did show clearly however, that a sense of control is a necessary reasoning mechanism for both women and midwives in achieving a safe delivery of care.

A further practical difficulty related to contact with the participants. The interview data were collected postnatally when the women were distracted by their babies and there were many breaks in the transcripts while the women were attending to various practical issues. Many of the clinicians had moved on from the antenatal clinics to their next rotational post so it was difficult to locate those who had been involved with the intervention for the full study period. For these reasons the quality of the data is not as robust as it might ideally be, but it does exemplify some of the challenges of undertaking research under 'real world' conditions.

The *Model of Gestational Weight Management Behaviour Prediction*, developed as a combination of two middle range theories, is unique in that it provides information on the modifiable factors that are likely to influence the success and sustainability of a similar intervention elsewhere, both for clinicians and for obese women. It should be acknowledged however, that women and clinical facilitators self-selected to participate in the intervention, and therefore were likely to be those who enjoyed being part of a group, found the presence of others supportive, and were motivated to prevent excessive gestational weight gain. This could be perceived as a limitation but it would be a mistake to assume that there is a one-size-fits-all answer to preventing excessive gestational weight gain. The middle range theories that underpin the *Model of Gestational Weight Management Behaviour Prediction* can only apply to the experiences of these obese women, and these clinical facilitators who were relatively inexperienced at the time of evaluation.



In line with the point about non-generalisable theory, the realist methodology states that the middle range theories developed through the process of CMO refinement are designed to contribute to further cycles of inquiry and ongoing theoretical development. The model developed during my study offers plenty of scope for other researchers to focus on specific concepts within the Theory of Planned Behaviour and Social Learning Theory that appear to have the greatest potential for impact in relation to gestational weight gain (but are under-researched in this context) , such as attitude, normative behaviour, and positive reinforcement.

Choice of topic for a PhD study may prove to be both a limitation and a strength. Focusing on a topic of international clinical and research interest (gestational weight gain) associated with one of political priority (obesity) and combining this with an emerging methodology (realist evaluation) was challenging due to the speed of development in these fields, but also provided a continuous focus of interest. In order to manage this situation in the writing of this thesis, some chapters of the thesis have been 'dated' chronologically to enable an understanding of how these issues have impacted on practice over time.

My various roles during the study (midwife, project officer, researcher, steering group member) impacted as both strengths and potential limitations to the study. As discussed in Chapter 5, I was aware of the potential for conflict and bias that existed in these parallel roles from the outset, and employed various strategies to maintain objectivity and 'role separateness' as far as possible. Nevertheless, this was challenging to achieve. I do believe though, that my personal engagement with the study enabled me to obtain a richer perspective, which is a strength of the study. Examples in relation to data collection include: the identification of additional stakeholders for interview, the ability follow up on suppositions by probing, and the awareness of participant sensitivities during interview.

This section has explored the strengths and limitations of my study. Realist evaluation, amongst other realist methodologies, is increasingly attracting international interest. The next section explores the future potential of the methodology.

## **9.4 Future potential for realist evaluation**

Marchal et al (2012) suggests that uptake of the methodology has been surprisingly slow, evidenced by very ‘young’ literature, given Pawson and Tilley published their seminal work in 1997 (Pawson & Tilley 1997). These authors also note that researchers to date have adapted the methodology (at times inappropriately) to suit their own needs, possibly compromising their results. This may be due to the methodological challenges highlighted at the beginning of this section, or to the fact that little formal guidance has existed on how to undertake a realist evaluation.

More recently, international interest and expertise in realist evaluation appears to be growing at a rapid rate, especially in the UK. This has been supported by organised groups of researchers and academic institutions, rather than by authors of single studies. The focus of these groups appears to be on teaching skills and sharing best practice for emergent realist methodologies. In 2014, the Centre for Advancement in Realist Evaluation and Synthesis (CARES) at the University of Liverpool (UK) held an inaugural conference, followed by several smaller scale events for students and early career researchers. In 2015, the University of Leeds (UK) hosted a ‘Realist Methodologies’ two day event, with a focus on workshops for doctorate students, and the Australasian Evaluation Society formed a Special Interest Group (SIG) for Realist Evaluation and Realist Synthesis.

Eminent researchers in the field such as Trisha Greenhalgh, Justin Jagosh and Ray Pawson (Greenhalgh et al. 2015), are currently collaborating on the RAMESES II study, with the aim of developing guidance and reporting standards for realist evaluation. Meanwhile,

researchers are able to discuss realist approaches through an open online discussion forum ([www.jiscmail.ac.uk/RAMESES](http://www.jiscmail.ac.uk/RAMESES))

As a result of this level of interest, it is likely in the near future that there will be not only a very large number of published studies using realist methodology, but also that stricter guidelines and standards will be formally set for realist evaluation. These changes will not only introduce a degree of methodological rigor for researchers, but also improve the credibility of study findings.

## **9.5 Chapter summary**

This final chapter has described my experience of using the realist evaluation methodology to explore the reality of what worked for whom, and in which circumstances, in relation to an intervention designed to support obese women to achieve a healthy weight gain during pregnancy as part of routine antenatal care. The challenges of the methodology have been discussed in relation to my own and other researchers' experiences, highlighting four problematic issues encountered in my own work. The wider limitations of my study have been discussed, and recommendations made for the future potential of the methodology.

## **9.6 Conclusion to the thesis**

This thesis has presented a realist evaluation of a complex healthcare intervention designed to support obese women to achieve a health gestational weight gain, according to the Institute of Medicine guidelines.

Excessive weight gain during pregnancy is known to contribute to the growing rates of obesity throughout the world, including Australia, presenting a window of opportunity for intervention. There are a number of published studies of interventions that attempt to

support women to gain weight during pregnancy within recommended limits, but these are not uniformly successful, often resource intensive and therefore likely to be unsustainable in Australia's public health service.

The complex intervention which was the subject of this thesis utilised group antenatal care for obese women, with a focus on appropriate gestational weight gain through the encouragement of healthy eating and increased activity. A literature search confirmed no previously published reports of similar interventions that combine group antenatal care simultaneously with weight management strategies. The intervention was introduced in two locations in Sydney, Australia in 2010 and evaluated for this study using the realist evaluation framework, based on critical realism.

During the design phase of the intervention a number of hypotheses were proposed, based on the theory of self-efficacy. The hypotheses took the form of context-mechanism-outcome (CMO) configurations, representing the current contexts, the desired outcomes, and the strategies should be put in place (the mechanisms) to enable the desired changes to occur.

The study utilised mixed methods, both quantitative and qualitative data, which were integrated during the analysis, using a two-phase sequential process in order to build explanations about what worked for whom and how. The analysis process involved firstly a comparative analysis, to categorise the data, and secondly a thematic analysis to reconnect the data and search for relationships. The findings were applied to the original hypotheses to produce a number of refined CMO configurations.

The *Model of Gestational Weight Management Behaviour Prediction* was subsequently developed to explain the determinants of behaviour in the context of the intervention in both locations, generating broad 'transferable lessons' of interest. The model is appropriate to both the women and health professionals who participated in the intervention, in relation to gestational weight gain management.

These transferable lessons have been presented as ten key features that are considered necessary for the successful development and implementation of similar complex interventions that focus on women's weight gain in pregnancy. These key features are related to those mechanisms in the refined configurations which are central to increasing the intention and ability of individuals to engage with the intervention, and their opportunity to do so.

Realist evaluations provide the opportunity to investigate interventions in depth, in a real world context. Through a realist evaluation, this study has contributed to the literature by exploring what worked, for whom, and in which circumstances within a group antenatal care intervention, and presented some broad understandings of what tends to work in this context. In line with the realist perspective, some strategies within this intervention worked particularly well for some women, but not all, and not necessarily in a consistent way. It is clear however, that there is an opportunity for further research into the determinants of behaviour that appear to have the greatest influence on weight management during pregnancy, in order to maximise the impact of future interventions.

## Appendix 1: Program for the intervention group sessions

Session no Gestation Facilitator(s)	Pregnancy discussion topic	Healthy eating discussion topic	Physical activity discussion topic	Review topics
1 18-22 weeks  Midwife and dietitian	<ul style="list-style-type: none"> <li>• Common problems of pregnancy, why they occur and what might help</li> <li>• 19 week ultrasound scan</li> </ul>	<ul style="list-style-type: none"> <li>• Healthy Eating (5 food groups) and limiting weight gain (including healthy snacks).</li> <li>• Dispelling myths</li> </ul>	<ul style="list-style-type: none"> <li>• Benefits of increasing activity.</li> <li>• Precautions/Flags.</li> </ul>	
2. 22-26 weeks  Midwife and physiotherapist	<ul style="list-style-type: none"> <li>• Becoming Parents – What does it mean?</li> <li>• Sleep and settling</li> <li>• SIDS</li> <li>• Managing work and family life</li> <li>• Stress reduction and ways to relax</li> <li>• Relaxation measures</li> </ul>	<ul style="list-style-type: none"> <li>• Revisiting the five food group and important nutrients for pregnancy.</li> <li>• The hunger scale</li> </ul>	<ul style="list-style-type: none"> <li>• Type, intensity, frequency and duration of physical exercise.</li> <li>• Goal setting including recognition of barriers to activity/exercise</li> </ul>	WELL Diary - Personal goals Nutrition common discomforts
3. 26-30 weeks  Midwife and dietitian	<ul style="list-style-type: none"> <li>• Feeding your baby</li> <li>• Benefits of breastfeeding for mother and baby</li> </ul>	Portion size.	<ul style="list-style-type: none"> <li>• Share stories and trouble shoot difficulties.</li> <li>• Posture and backcare – protecting your back.</li> </ul>	WELL diary - Personal goals Relaxation measures Parenting skills
4. 29-33 weeks  Midwife and physiotherapist	<ul style="list-style-type: none"> <li>• Readiness for labour and birth</li> <li>• The labour process</li> <li>• Comfort measures in labour</li> <li>• Birth plans</li> <li>• Role of support person in labour</li> </ul>	Staying motivated	Pelvic floor	WELL diary - Personal goals Feeding your baby
5. 33-35 weeks  Midwife and dietitian	<ul style="list-style-type: none"> <li>• Labour and birth revision</li> <li>• Keeping active during labour and birth</li> <li>• When labour and birth does not go to plan</li> <li>• Chemical pain relief</li> </ul>	Making sense of food labels	Physical activity towards the end of pregnancy	WELL diary - Personal goals Readiness for labour and birth

Session no Gestation Facilitator(s)	Pregnancy discussion topic	Healthy eating discussion topic	Physical activity discussion topic	Review topics
6. 35-39 weeks  Midwife	<ul style="list-style-type: none"> <li>• Who is going to help you at home after baby arrives</li> <li>• Father's role</li> <li>• Community resources</li> <li>• Postnatal Depression: what to look for and what to do</li> </ul>	Making healthy choices when eating out	Relaxation for labour, birth and postnatal	WELL diary - Personal goals Keeping active during labour and birth
7. 38-41 weeks  Midwife and Child and Family Health nurses	<ul style="list-style-type: none"> <li>• Contraception and menstrual cycle</li> <li>• Sexuality and me</li> <li>• Feelings about yourself and your support systems</li> <li>• Sharing together thoughts about the birth process and the early postnatal weeks</li> </ul>	Healthy eating tips for busy lives and easy meals.	Relaxation session - massage.	WELL diary - Personal goals Parenting issues take-home activity feedback Who will support you at home with your new baby?
8. Postnatal reunion Midwife and dietitian	<ul style="list-style-type: none"> <li>• Sharing of birth stories</li> <li>• Plans for taking care of myself, my baby, and my family</li> </ul>	<ul style="list-style-type: none"> <li>• Eating as a family</li> <li>• Breastfeeding and nutrition</li> </ul>	Back care and pelvic floor	WELL diary - Personal goals What to expect in the early months with your baby

## Appendix 2: Ethics approval letters



26 October 2010

Professor Caroline Homer  
Nursing, Midwifery and Health  
CB10.07.211  
UNIVERSITY OF TECHNOLOGY, SYDNEY

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F +61 2 9514 1244  
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UTS CRICOS PROVIDER CODE 00099F

Dear Caroline,

**UTS HREC 2010-365 – HOMER, Professor Caroline, DAVIS, Associate Professor Deb, FOUREUR, Professor Maralyn (for RAYMOND, Ms Jane, PhD student) – “Factors that impact on the delivery and outcome of a complex intervention design to limit weight gain during pregnancy for obese women: A realist evaluation”***[External Ratification: Harbour/Hawkesbury Northern Sydney Central Coast Human Research Ethics Committee (NSCCH) HREC approval – Protocol 1003-075M NSW NEAF ref number HREC/10/HAWKE/61 01/07/2010 to 01/07/2014]*

Thank you for your response to my email dated 21/10/10. Your response satisfactorily addresses the concerns and questions raised by the Committee, and I am pleased to inform you that your external ethics clearance has been ratified.

Your UTS clearance number is UTS HREC REF NO. 2010-365R

Please note that the ethical conduct of research is an on-going process. The *National Statement on Ethical Conduct in Research Involving Humans* requires us to obtain a report about the progress of the research, and in particular about any changes to the research which may have ethical implications. This report form must be completed at least annually, and at the end of the project (if it takes more than a year). The Ethics Secretariat will contact you when it is time to complete your first report. You must also provide evidence of continued approval from the Harbour/Hawkesbury Northern Sydney Central Coast Human Research Ethics Committee (NSCCH).

I also refer you to the AVCC guidelines relating to the storage of data, which require that data be kept for a minimum of 5 years after publication of research. However, in NSW, longer retention requirements are required for research on human subjects with potential long-term effects, research with long-term environmental effects, or research considered of national or international significance, importance, or controversy. If the data from this research project falls into one of these categories, contact University Records for advice on long-term retention.



If you have any queries about your ethics clearance, or require any amendments to your research in the future, please do not hesitate to contact the Ethics Secretariat at the Research and Innovation Office, on 02 9514 9772.

Yours sincerely,

Associate Professor Marion Haas  
Chairperson  
UTS Human Research Ethics Committee



22 July 2010

A/Prof D Davis  
Centre for Midwifery, Child and Family Health  
University of Technology, Sydney, PO BOX 123  
Broadway NSW 2007

Dear A/Prof Davis,

**Re: Protocol 1003-075M(Other) - D Davis, M Foureur, V Clements, A Teate, J Raymond, C Adams, L Mollart, A Zuschmann**  
**An evaluation of a new antenatal maternity service model focusing on weight management for women with a BMI >= 30 in North Sydney Central Coast and South East Sydney Illawarra Area Health Services. (AU RED Ref. HREC/10/HAWKE/61)**

Thank you for your application dated 17 July 2010 (received 20 July 2010), requesting approval for an amendment from the **HAWKESBURY** Human Research Ethics Committee (HREC) of Northern Sydney Central Coast Health (NSCCH). I am pleased to inform you that your amendment for the protocol on the above study has now been approved.

**Description of amendment:**

- Food record at 20 and 36 weeks gestation and physical activity log at 20, 28 and 36 weeks have been simplified and amalgamated into the eating and Exercise log to be completed by the women at 20 and 36 weeks gestation.
- Addition of 20-25 postnatal individual interviews with pregnant women/service users. Consent for the interviews will be sought at the postnatal group.
- Jane Raymond (approved Associate Researcher) has re-focused her PhD study to examine the internal and external factors that impact on the delivery and outcome of the antenatal service. The aim of the study will be to explore the transferability and sustainability of the service. It is intended that the evaluation study and the examination of the impact factors will complement the findings of each.

The updated amendment involves the following documentation:

- Amendment Form dated 17 July 2010
- Patient Information Sheet and Consent Form Version 3.0 dated 11 July 2010 (strikethrough and clean copy)
- Patient Information Sheet and Consent Form\_Interviews Version 1.0 dated 11 July 2010
- Eating and Exercise Log Version 1.0 dated 11 July 2010

The HREC recommends that you consult with your Medical Defence Union to ensure that you are adequately covered for the purpose of conducting this clinical trial.

In order to comply with the *Guidelines For Good Clinical Research Practice (GCRP) in Australia*, and in line with NSCCH HREC policy, may I remind you that it is the Chief Investigator's responsibility and a condition of approval, to ensure that:

1. The HREC is notified of anything that might warrant review of the ethical approval of the project, including unforeseen events that might affect the ethical acceptability of the project.
2. The HREC is notified of all Serious Adverse Events (SAEs) or Serious Unexpected Suspected Adverse Reactions (SUSARs) in accordance with the Serious Adverse Event Reporting Guidelines. Please refer to the Research Office website.
3. Proposed amendments to the research protocol or conduct of the research that may affect the ethical acceptability of the project are submitted to the HREC on an amendment form (including any relevant attachments). For multi-centre studies, the Chief Investigator should submit to the Lead HREC and then send the amendment approval letter to the investigators at each of the sites so that they can notify their Research Governance Officer.
4. Proposed changes to the personnel involved in the study are submitted to the HREC on a Change in Personnel Form (accompanied by the investigator's CV where applicable).
5. The HREC must be provided with an annual progress report for the study by the 31<sup>st</sup> October each year. For multi-centre studies the Chief Investigator should submit to the Lead HREC on behalf of all sites.
6. The HREC must also be provided with a final report upon completion of the study. For multi-centre studies the Chief Investigator should notify the Lead HREC and the investigators at each site should notify the relevant Research Governance Officer.
7. The HREC must be notified, giving reasons if the project is discontinued at a site before the expected date of completion.

Please refer to the NSCCAHS Research Office website to access forms such as the amendment form, Annual/Final Report Form, Change in Personnel Form and Serious Adverse Event Guidelines and Forms;

Intranet:

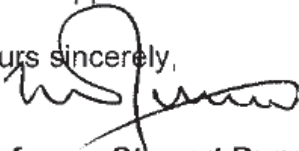
<http://intranet01.nsaahs.nsw.gov.au/intranet/rns/research/Ethics/HREC/default.shtml>

Internet:

<http://www.nscchahs.health.nsw.gov.au/services/research/default.shtml>

HREC approval is valid for four (4) years from the date of the approval letter.

Yours sincerely,



**Professor Stewart Dunn**

Chairperson

HAWKESBURY HREC

NORTHERN SYDNEY CENTRAL COAST HEALTH

## Appendix 3: Sample consent forms and information sheets

NORTHERN SYDNEY  
CENTRAL COAST  
NSW HEALTH

SOUTH EASTERN SYDNEY  
ILLAWARRA  
NSW HEALTH

### CONSENT FORM FOR INTERVIEW - FOR WOMEN ENGAGED IN THE SERVICE

*An evaluation of a new antenatal maternity service model focusing on weight management for women in North Sydney Central Coast and South East Sydney Illawarra Area Health Services*

1. I, .....  
of .....  
agree to participate as a subject in an interview described in the participant information statement attached to this form.
2. I acknowledge that I have read the participant information statement, which explains why I have been selected, the aims of the interview as part of the evaluation study, and the nature and the possible risks of the investigation. The statement has been explained to me to my satisfaction.
3. Before signing this consent form, I have been given the opportunity to ask any questions relating to any possible physical and mental harm I might suffer as a result of my participation and I have received satisfactory answers.
4. I understand that I can withdraw from the study at any time without prejudice to my relationship with the Area Health Service, Sutherland or St. George Hospital.
5. I agree that research data gathered from the results of the study may be published, provided that I cannot be identified.
6. I understand that if I have any questions relating to my participation in this interview, I may contact Ms Jane Raymond on [REDACTED], who will be happy to answer them.
7. I acknowledge receipt of a copy of this Consent Form and the Participant Information Statement.

8. By signing below I am indicating my consent to be interviewed about my experience of the antenatal service I have attended. I understand the interview will take approximately 30-60 minutes and will be conducted at a time and location convenient to me. I understand the interview will be tape recorded for later transcription.

Complaints may be directed to South Eastern Sydney/Illawarra Area Health Service Human Research Ethics Committee on (02) 9113 1111.

Signature of subject                      please PRINT name                      date

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Signature of investigator                      please PRINT name                      date

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## **Information for women who have engaged in the new service regarding interview**

### ***An evaluation of a new antenatal maternity service model focusing on weight management for women with a BMI $\geq 30$ in North Sydney Central Coast and South East Sydney Illawarra Area Health Services***

As a woman who has attended the new antenatal service introduced in South East Sydney and Illawarra Area Health Service (SESAHS), or North Sydney Central Coast Area Health Service (NSCCAHS), you are invited to participate in an interview to tell us more about your experience of this service.

#### **PURPOSE OF THE INTERVIEW**

In addition to the questionnaire that you are completing after your baby is born, we would very much like to find out more about your experience of the antenatal service. Your views do not have to be necessarily positive, and your comments on the service, or the way you were provided with information about the service, will be welcomed. We are particularly interested in your views about what you liked or disliked about your antenatal care.

Investigator carrying out the interviews:

Ms Jane Raymond

PhD student, UTS, and Project Officer for the SSWInG service, SESAHS

Ph 02 9514 4914

Jane.raymond@uts.edu.au

#### **METHOD AND DEMANDS ON WOMEN WHO PARTICIPATE**

If you choose to be interviewed you will be asked to;

- Participate in an individual interview of approximately 30-60 minutes duration, within 2 months of your baby's birth, at a time and place convenient to you

These interviews will be audio taped and transcribed

Typical questions asked at interview may include:

1. What was your experience of having antenatal care in a group?
2. What helped you to manage your weight gain in pregnancy?
3. What could the health service do differently to help women manage their weight gain in pregnancy?

#### **CONSENT PROCESS**

If you would like to participate please complete the attached consent form and return this directly to your group facilitator.

### **POSSIBLE RISKS, INCONVENIENCES AND DISCOMFORTS**

Apart from the time taken to participate in the interview we can foresee no risks for you. Your involvement in the study is voluntary and you may withdraw your participation from this part of the study at any time. Declining to participate in the interview will not affect your relationship with the hospital, your care providers or the care and treatment you receive in any way. All published data will be in an anonymous form. Only the researchers will have access to raw data and this will be stored in a secure office and password protected computer files.

### **FUNDING AND BENEFITS OF THE RESEARCH**

The new antenatal service model has been funded by the NSW Department of Health and a small amount has been set aside for the evaluation. This research overall, will inform the development of this program in the future. As a PhD Research student at the University of Technology, Sydney, Jane Raymond is further investigating which aspects of the service are successful and why, and whether the service may be transferable to other locations. Findings will be published in a report and possibly published in professional journals and presented at professional conferences. Anonymity is assured and you will not be identified in any part of the research.

### **ETHICS REVIEW AND COMPLAINTS**

This study has been reviewed and approved by North Sydney Central coast Area Health Service (Protocol 1003-075M). If you have any concerns or complaints regarding the way this research has been conducted, you can contact the South Eastern Sydney Illawarra Area Health Service Human Research Ethics Committee on (02) 9113 1111.

Jane Raymond's PhD study (which will use some of the findings from the service evaluation) also has ethical approval from the University of Technology, Sydney. Jane Raymond's PhD is supervised at the University of Technology, Sydney, by Professor Caroline Homer ([caroline.homer@uts.edu.au](mailto:caroline.homer@uts.edu.au)) phone number 9514 4886, and Associate Professor Deborah Davis ([deborah.davis@uts.edu.au](mailto:deborah.davis@uts.edu.au)) phone number [REDACTED].

Thank you for your interest in this study



## Appendix 4: The Conjectured CMO Realist Hypothesis Grid

CMO	CONTEXT		MECHANISM	OUTCOME
	Context -- supported by evidence (Chapter 2)	Context - local	Planned	Planned
<b>CMO 1</b> service provision	There are few antenatal services, or models of care in Australia that address gestational weight gain for obese pregnant women <sup>22</sup>	Local management and clinical support for an antenatal model of care specifically designed to support obese women in weight management	Utilise group antenatal care with a focus on addressing gestational weight gain:  1. Continuity of midwifery care with appropriate arrangements for referral and consultation 2. Resources fit for purpose and provided within current budget 3. Hand held notes for women to maximise safety through information sharing	To develop a sustainable intervention in the form group antenatal care for obese women that will demonstrate: 1. Safety - effective referral pathways, communication, collaborative working 2. Logistical feasibility – adequate resources available and fit for purpose: staffing, equipment, venue
<b>CMO 2</b> Group attendance	Weight management groups appear to be unpopular when offered in addition to regular antenatal visits <sup>23 24</sup>	In a published trial of group antenatal care in at Location A, midwives had initial misgivings about their abilities but gained confidence with support <sup>4</sup>	1. Group antenatal care will incorporate weight management strategies as part of antenatal care ('one stop shop' approach). 2. Women with BMI $\geq$ 30kg/m <sup>2</sup> will be offered group antenatal care at the booking in visit as part of a routine discussion about options for antenatal care	1. Groups will be filled to capacity 2. Women will attend group antenatal care regularly for scheduled visits

<sup>22</sup> WHA 2008, *Maternal Obesity Implications for Pregnancy and Birth Outcomes - Results of Survey*, Women's Hospitals Australasia conference presentation, Royal Hospital for Women, Sydney

<sup>23</sup> Lee, A., Karpavicius, J., Gasparini, E. & Forster, D. 2012, 'Implementing a diet and exercise program for limiting maternal weight gain in obese pregnant women: a pilot study', *Australia and New Zealand Journal of Obstetrics and Gynaecology*, vol. 52, pp. 427-32.

<sup>24</sup> Poston, L. 2013, 'Developing a complex intervention for diet and activity behaviour change in obese pregnant women (the UPBEAT trial); assessment of behavioural change and process evaluation in a pilot randomised co



CMO	CONTEXT		MECHANISM	OUTCOME
	Context -- supported by evidence (Chapter 2)	Context - local	Planned	Planned
<b>CMO 3</b> Acceptability (health professionals)	Midwives report new opportunities to develop positive relationships with women and colleagues through group antenatal care <sup>25</sup> , but there are no published reports of group antenatal care specifically for obese women	Group Care was functioning well at Location A, but there was no experience in this model of care at Location B	1. Group facilitators are provided with training in facilitating groups. 2. A written handbook is developed that will adequately support new group facilitators and provide standardisation	Health professionals will report satisfaction with the model of care
<b>CMO 4</b> Acceptability (women)	Women who are obese report that antenatal care is often impersonal and focussed on potential risk <sup>26</sup>	Women at Location A dissatisfied with local policy for referral to obstetric high-risk care at alternative facility on basis of their BMI	Multidisciplinary Care provided in one place (community venue), at one time by familiar care providers 1. Outreach care provided at group by obstetrician, physiotherapist and dietitian 2. Continuity of midwifery care provided by the same two midwives 3. Time provided in the group sessions for informal networking	Women will report satisfaction with the model of care

<sup>25</sup> Teate, A., Leap, N. & Homer, C.S.E. 2013, 'Midwives' experiences of becoming CenteringPregnancy facilitators: A pilot study in Sydney, Australia', Women and Birth, vol. 26, no. 1, pp. e31-e6.

<sup>26</sup> Furber, C. & McGowan, L. 2011, 'A qualitative study of the experiences of women who are obese and pregnant in the UK', Midwifery, vol. 27, no. 4

CMO	CONTEXT		MECHANISM	OUTCOME
	Context -- supported by evidence (Chapter 2)	Context - local	Planned	Planned
<b>CMO 5</b> Weight gain	Excessive weight gain increases the risk of adverse perinatal outcomes. The prevalence of excessive gestational weight gain in developed countries (including Australia) is reported to be approximately 50% <sup>27</sup>	Local audit of clinical outcomes demonstrated higher rates of complications during pregnancy (eg hypertension, gestational diabetes) supporting development of an appropriate intervention for obese pregnant women	1. Women are informed about weight gain recommendations and weigh themselves at each antenatal group session 2. Goal setting strategies 3. Eating and Exercise Log	Women who are obese will gain weight within the IOM guidelines (5-9kg)
<b>CMO 6</b> Information	Women are motivated at the outset of pregnancy to attain and maintain a healthier lifestyle but report inaccurate and inconsistent health messages <sup>28</sup>	No local context identified	1. Information provided in the groups is evidence-based and presented by a multi-disciplinary team through a series of topics 2. Women involved in the content planning for each session. Debate encouraged by facilitator	Women will report accurate information in terms of healthy eating and activity during pregnancy
<b>CMO 7</b> Support	Women report lack of support (societal and personal) to attain and maintain a healthier lifestyle <sup>29</sup>	No local context identified	1. Continuity of midwifery carer provided throughout pregnancy 2. Peer support provided through other members of the group	Women will report that they have received helpful support from the midwives and their peers via group antenatal care

<sup>27</sup> Park, S., Sappenfield, W.M., Bish, C., Salihu, H., Goodman, D. & Bensyl, D.M. 2011, 'Assessment of the Institute of Medicine recommendations for weight gain during pregnancy: Florida, 2004-2007', *Matern Child Health J*, vol. 15, no. 3, pp. 289-301.

<sup>28</sup> Ferrari, R., Siega-Riz, A., Evenson, K., Moos, M. & Carrier, K. 2013, 'A qualitative study of women's perceptions of provider advice about diet and physical activity during pregnancy', *Patient Education and Counseling*, vol. 91, no. 3, pp. 372-7.

<sup>29</sup> Sui, Z., Turnbull, D. & Dodd, J. 2012, 'Overweight and obese women's perceptions about making healthy change during pregnancy: a mixed method study', *Maternal and Child Health Journal*, vol. December.

CMO	CONTEXT		MECHANISM	OUTCOME
	Context -- supported by evidence (Chapter 2)	Context - local	Planned	Planned
<b>CMO 8</b> Confidence (women)	Women lack confidence to manage weight gain during pregnancy <sup>30</sup>	No local context identified	Goal setting and other motivational techniques known to be successful for weight management with non-pregnant populations	Women will demonstrate increased confidence in their ability to manage their weight gain by making positive changes in relation to eating and activity
<b>CMO 9</b> Confidence (health professionals)	Professionals are reluctant to provide weight gain advice to women who are obese due to perceived lack of confidence in their knowledge and skills <sup>3132</sup>	No clinical practice guidelines in relation to gestation weight gain were available at the time of the implementation of the intervention to guide practice	1. Training is provided in relation to - motivational interviewing - communication skills training, - potential complications in pregnancy for obese women - lifestyle advice for obese women 2. Regular de-briefing and support sessions in antenatal clinics and group venues.	Health professionals will report increased confidence and competence in their ability to provide accurate and consistent information in relation to pregnancy and healthy eating/activity  2. Health professionals will report increased confidence and competence in discussing pre-pregnancy BMI and gestational weight gain with women who are obese

<sup>30</sup> Wiles, R. 1998, 'The views of women of above average weight about appropriate weight gain in pregnancy', midwifery, vol. 14, pp. 254-60.

<sup>31</sup> Heslehurst, N., Russell, S., McCormack, S., Sedgewick, G., Bell, R. & Rankin, J. 2013, 'Midwives perspectives of their training and education requirements in maternal obesity: A qualitative study', Midwifery, vol. 29, no. 7, pp. 736-44.

<sup>32</sup> Schmied, V.A., Duff, M., Dahlen, H., Mills, A.E. & Kolt, G.S. 2011, 'Not waving but drowning': a study of the experiences and concerns of midwives and other health professionals caring for obese childbearing women', Midwifery, vol. 27, no. 4, pp. 424-30.

CMO	CONTEXT		MECHANISM	OUTCOME
	Context -- supported by evidence (Chapter 2)	Context - local	Planned	Planned
<b>CMO 10</b> Relationship	Fear of damaging relationship with the woman <sup>33</sup>	No local context identified	Communication 'tools' provided to support health professionals to have conversations about weight and weight gain.	Health professionals will maintain positive relationship with the woman through improved communication skills and strategies.

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<sup>33</sup> Willcox, J.C., Campbell, K.J., Van der Plight, P., Hoban, E., Pidd, D. & Wilkinson, S. 2012, 'Excess gestational weight gain: an exploration of midwives' views and practice', BMC Pregnancy and Childbirth, vol. 12, no. 102.

## Appendix 5: Sample focus group questions for staff offering women the intervention at the booking in visit

1. What is your understanding of how the intervention functions? How well prepared do you feel to explain this option adequately to women who are obese?
  - *If yes, how did you gain the information?*
  - *If no, what would assist you be able to explain the intervention groups to women more accurately?*
  - *What would have motivated you to find out more?*
2. In preparation for the implementation of the intervention groups, training was initiated to increase the confidence of health professionals in providing accurate and consistent weight management and lifestyle information for women who are obese.
  - *Did you have an opportunity to attend this training?*
  - *If yes, was the training helpful in increasing your confidence to provide accurate and consistent weight management and lifestyle information to women who are obese?*
  - *If no, (or did not attend training), what would have increased your confidence in this area?*
3. How confident did you feel at the outset of the intervention to discuss weight and weight gain with pregnant women who are obese?
  - *How confident do you feel now compared to then?*
  - *What has helped to make you more confident/less confident?*
  - *Do you feel that discussing a woman's weight is part of your role?*
  - *Do you feel that discussing weight and weight gain at the booking visit is important?*
4. In order to provide support in communication to the midwives in the antenatal clinics, a number of 'tools' were produced such as the coloured BMI chart and weight gain brochure.
  - *Did you find these helpful in you conversations with obese women?*
  - *If yes, how did you use them?*
  - *If no, what would have been more helpful?*
5. Do you feel that your conversations about weight and weight gain negatively impact on your relationships with women?
  - *if yes, what strategies do you use to reduce this impact?*
  - *If no, what helps you to discuss these issues in a positive way?*
6. Have there been any unexpected changes to your own personal or professional life as a result of being involved in the intervention?

## Appendix 6: NVivo matrix: confidence to discuss weight and weight gain

Responses from midwives and midwifery students in the antenatal clinic, who offered the intervention to women. The colours indicate the number of responses; blue (very few) to red (many)

Confidence to discuss weight and weight gain		Negative	Positive	Unexpected
Site	A	30	25	16
	B	27	15	7
Age range	<30	21	18	7
	30-45	23	13	11
	>45	13	9	5
Time registered	<5yrs	9	10	2
	5-10yrs	8	9	6
	>10yrs	36	17	12
	St MW	4	4	3
Area of Practice	Core ANC	31	13	6
	Rotational	20	25	15
	Management	6	2	2
Attended training	Yes	4	10	9
	No	53	30	14

## Appendix 7: Detailed characteristics of the study participants

### 7.1 Characteristics of the women

Pseudo-nym of woman	Location	Age (years)	Obesity Class <sup>1</sup>	Parity	Weight change <sup>2</sup>	Mode of Birth <sup>3</sup>	Groups attended <sup>4</sup>
Dale	B	25-30	Class III	0	>9kg	For/vac	4
Fran	B	25-30	Class I	0	>9kg	Normal	6
Gabi	B	>30	Class III	1	5-9kg	CS	5
Lona	B	>30	Class I	1	<5kg	Normal	6
Jenny	B	>30	Class II	1	<5kg	CS	6
Kim	B	<25	Class I	0	>9kg	CS	5
Lisa	B	<25	Class III	0	5-9kg	CS	4
Mai	B	25-30	Class II	1	5-9kg	CS	7
Nora	B	25-30	Class III	2	<5kg	CS	4
Pip	B	>30	Class III	1	<5kg	Normal	5
Anna	A	>30	Class II	1	<5kg	Normal	4
Beatie	A	>30	Class I	0	<5kg	Normal	7
Cari	A	25-30	Class I	1	5-9kg	Normal	6
Evie	A	25-30	Class II	0	5-9kg	For/vac	7
Hattie	A	>30	Class I	1	>9kg	Normal	6
Rae	A	25-30	Class I	0	>9kg	For/vac	7
Sasha	A	25-30	Class I	0	>9kg	Normal	7
Tara	A	25-30	Class I	1	<5kg	CS	6
Uma	A	25-30	Class II	0	5-9kg	CS	6
Zara	A	25-30	Class II	0	<5kg	Normal	7

<sup>1</sup> Obesity Class I = BMI>30-34.9kg/m<sup>2</sup>, Class II = BMI>35-39.9kg/m<sup>2</sup>, Class III = BMI>40kg/m<sup>2</sup>

<sup>2</sup> 5kg = below, 5-9kg = within, or >9kg = above the IOM guidelines for gestational weight gain in obese women

<sup>3</sup> Normal = spontaneous vaginal birth, CS = Caesarean birth, For/vac = instrumental birth

<sup>4</sup> Maximum of 7 sessions

## 7.2 Characteristics of the midwives and midwifery students

Pseudonym of midwife or student	Age range (years)	Time registered <sup>1</sup>	Area of Practice <sup>2</sup>	Location	Attended training <sup>3</sup>
Carol	<30	<5yrs	Rotational	B	No
Karla	<30	<5yrs	Rotational	B	No
Mary	<30	5-10 yrs	Core ANC	A	No
Teri	<30	St MW	Rotational	A	Yes
Jess	<30	St MW	Rotational	A	No
Holly	<30	<5yrs	Rotational	A	No
Karen	<30	5-10 yrs	Rotational	A	No
Pam	<30	St MW	Rotational	A	No
Chris	30-45	>10yrs	Core ANC	B	No
Liz	30-45	>10yrs	Core ANC	B	No
Marsha	30-45	>10yrs	Core ANC	A	No
Kathy	30-45	>10yrs	Rotational	A	Yes
Alex	30-45	5-10 yrs	Rotational	A	Yes
Sarah	>45	>10yrs	Core ANC	B	No
Annie	>45	>10yrs	Management	B	No
Nancy	>45	>10yrs	Management	A	No
Barb	>45	>10yrs	Core ANC	A	No

<sup>1</sup>Time registered = length of time since initial registration as a midwife

<sup>2</sup>Area of Practice:

Rotational = midwives moving between different areas of midwifery practice (birthing, antenatal clinic postnatal ward/community) for prescribed periods of time for the purpose of gaining experience or maintaining clinical skills

Core = midwives who only worked in one area; in this case the antenatal clinic

Management = midwives with combined management and clinical responsibilities (usually in smaller hospitals)

<sup>3</sup>Attended training = initial 2 day multi-disciplinary training provided to facilitators, midwifery staff and managers prior to the implementation of the intervention



### 7.3 Characteristics of the intervention group facilitators

Professional group	Location A		Location B	
	Number	Pseudonym	Number	Pseudonym
Midwives	2	Annie Jill	3	Lyn Kate Mary
Dietitians	1	Donna	1	Lorna
Physiotherapist	1	Eve	0	
<b>TOTAL</b>	<b>4</b>		<b>4</b>	

### 7.4 Characteristics of the additional key stakeholders

Occupation	Location A		Location B	
	Number	Pseudonym	Number	Pseudonym
Antenatal clinic manager	2	Joan Narelle	2	Grace Andrea
Physiotherapy manager	1	Margaret	0	
Dietetic manager	1	Jackie	0	
Antenatal clinic clerk	0		1	Amy
Obstetrician	1	Michael	2	Ken Tom
<b>TOTAL</b>	<b>5</b>		<b>5</b>	

## Appendix 8: The Refined CMO Realist Hypothesis Grid

CMO	CONTEXT		MECHANISM		OUTCOME	
	Context -- supported by evidence (Chapter 2)	Context – post-interviews	Resources (Planned/tangible)	Reasoning (Barriers/enablers)	Planned	Occurred/unplanned
<b>CMO 1</b> Service provision	There are few antenatal services, or models of care in Australia that address gestational weight gain for obese pregnant women <sup>34</sup>	<ol style="list-style-type: none"> <li>1. Local management and clinical support for an antenatal model of care specifically designed to support obese women in weight management</li> <li>2. Development of communication strategy to encourage referral of women to the intervention.</li> </ol>	Utilise group antenatal care with a focus on addressing gestational weight gain: <ol style="list-style-type: none"> <li>1. Continuity of midwifery care with appropriate arrangements for referral and consultation</li> <li>2. Resources fit for purpose and provided within current budget</li> <li>3. Hand held notes for women to maximise safety through information sharing</li> </ol>	<ol style="list-style-type: none"> <li>1. Sense of local value for the service supported sustainability</li> <li>2. Lack of tangible visibility of the service led to poor understanding of what the intervention entailed and reduced rate of referral</li> </ol>	To develop a sustainable intervention in the form of group antenatal care for obese women that will demonstrate: <ul style="list-style-type: none"> <li>- safety: effective referral pathways, communication, collaborative working</li> <li>- logistical feasibility: adequate resources, staffing, equipment, venue</li> </ul>	<ol style="list-style-type: none"> <li>1. Safety was compromised where infrastructure (IT network, notes retrieval, obstetric support) was not adequate</li> <li>2. Lack of whole-of-service (inter-professional) response compromised sustainability of the intervention</li> </ol>
<b>CMO 2</b> Group Attendance	Weight management groups appear to	Process of offering intervention: Location B had a	1. Group antenatal care will incorporate weight management	1. Optimism or reluctance in women was enabler/barrier	Women will attend group antenatal care regularly for	<ol style="list-style-type: none"> <li>1. Groups not filled to capacity initially</li> <li>2. All 20 women</li> </ol>

<sup>34</sup> WHA 2008, *Maternal Obesity Implications for Pregnancy and Birth Outcomes - Results of Survey*, Women's Hospitals Australasia conference presentation, Royal Hospital for Women, Sydney

CMO	CONTEXT		MECHANISM		OUTCOME	
	Context -- supported by evidence (Chapter 2)	Context – post-interviews	Resources (Planned/tangible)	Reasoning (Barriers/enablers)	Planned	Occurred/unplanned
	be unpopular when offered in addition to regular antenatal visits, <sup>35 36</sup>	process for ensuring that women with BMI≥30kg/m <sup>2</sup> were seen initially by group facilitators who were very familiar with the groups. At Location A women were seen by the first available midwife	strategies as part of antenatal care ('one stop shop' approach). 2. Women with BMI≥30kg/m <sup>2</sup> will be offered group antenatal care at the booking in visit as part of a routine discussion about options for antenatal care	to participation 2. Personal approach from midwives promoted first attendance 3. Ongoing positive reinforcement irrespective of weight gain promoted ongoing attendance 4. Practicalities such as distance from home, transport and childcare availability affected attendance	scheduled visits	interviewed attended four or more sessions (maximum of seven) 3. Increased effort/time investment by health professionals for engagement and participation from women
<b>CMO 3</b> Acceptability (health professionals)	Midwives report new opportunities to develop positive relationships with women and colleagues through	No local prior experience in antenatal model of care that addressed gestational weight	1. Group facilitators are provided with training in facilitating groups. 2. A written handbook is	Acceptability associated with perception of: - value or importance - relevance to role	Health professionals will report satisfaction with the model of care	1. Facilitators reported high satisfaction 2. Health professionals overall reported

<sup>35</sup> Lee, A., Karpavicius, J., Gasparini, E. & Forster, D. 2012, 'Implementing a diet and exercise program for limiting maternal weight gain in obese pregnant women: a pilot study', *Australia and New Zealand Journal of Obstetrics and Gynaecology*, vol. 52, pp. 427-32.

<sup>36</sup> Poston, L. 2013, 'Developing a complex intervention for diet and activity behaviour change in obese pregnant women (the UPBEAT trial); assessment of behavioural change and process evaluation in a pilot randomised co

CMO	CONTEXT		MECHANISM		OUTCOME	
	Context -- supported by evidence (Chapter 2)	Context – post-interviews	Resources (Planned/tangible)	Reasoning (Barriers/enablers)	Planned	Occurred/unplanned
	group antenatal care <sup>37</sup> , but there are no published reports of group antenatal care specifically for obese women	gain, and varying experience in group antenatal care: Location A had group antenatal care already in place Location B did not have prior experience in group antenatal care	developed that will adequately support new facilitators and provide a measure of standardisation	identity - inter-professional /peer support - ownership - accessibility - Enablement  Poor acceptability was associated with: - lack of visibility - negative feedback - Lack of time for preparation - Lack of experience		that satisfaction was reduced where they received little feedback on the outcome of their efforts
<b>CMO 4</b> Acceptability (women)	Women who are obese report that antenatal care is often impersonal and focussed on potential risk <sup>38</sup>	1. Women dissatisfied with local policy for referral to obstetric high-risk care at alternative facility on basis of their BMI 2. Women were prepared with	Care provided in one place (community venue), at one time by familiar care providers 1. Outreach care provided at group by obstetrician, physiotherapist and dietitian	Acceptability associated with - optimism - positive relationships - support - acceptance - relevance - inclusion - reassurance	Women will report satisfaction with the model of care	Women reported being very satisfied with care

<sup>37</sup> Teate, A., Leap, N. & Homer, C.S.E. 2013, 'Midwives' experiences of becoming CenteringPregnancy facilitators: A pilot study in Sydney, Australia', Women and Birth, vol. 26, no. 1, pp. e31-e6.

<sup>38</sup> Furber, C. & McGowan, L. 2011, 'A qualitative study of the experiences of women who are obese and pregnant in the UK', Midwifery, vol. 27, no. 4

CMO	CONTEXT		MECHANISM		OUTCOME	
	Context -- supported by evidence (Chapter 2)	Context – post-interviews	Resources (Planned/tangible)	Reasoning (Barriers/enablers)	Planned	Occurred/unplanned
		written material, posters, local media	2. Continuity of midwifery care provided by the same two midwives 3. Peer support provided through other members of the group	Poor acceptability was associated with feelings of exclusion related to age and ethnicity		
<b>CMO 5</b> Weight change	Excessive weight gain increases the risk of adverse perinatal outcomes. The prevalence of excessive gestational weight gain in developed countries (including Australia) is reported to be approximately 50% <sup>39</sup>	Local audit of clinical outcomes demonstrated higher rates of complications during pregnancy (eg hypertension, gestational diabetes) supporting development of an appropriate intervention for obese pregnant women	1. Women are informed about weight gain recommendations and weigh themselves at each antenatal group session 2. Goal setting strategies are employed 3. Eating and Exercise Log is maintained	Ability to manage weight gain positively or negatively affected by: - friends and family - fear of failure  Weight gain managed positively by: - positive regular reinforcement - increased confidence to manage weight	Women will gain weight within the IOM guidelines (5-9kg)	1. Weight change was evenly distributed between those who gained within, more and less than the IOM guidelines 2. Women reported that they set their own weight gain goals, irrespective of official guidelines 3. Women did not share their weight with others in the group

<sup>39</sup> Park, S., Sappenfield, W.M., Bish, C., Salihu, H., Goodman, D. & Bensyl, D.M. 2011, 'Assessment of the Institute of Medicine recommendations for weight gain during pregnancy: Florida, 2004-2007', *Matern Child Health J*, vol. 15, no. 3, pp. 289-301.

CMO	CONTEXT		MECHANISM		OUTCOME	
	Context -- supported by evidence (Chapter 2)	Context – post-interviews	Resources (Planned/tangible)	Reasoning (Barriers/enablers)	Planned	Occurred/unplanned
<b>CMO 6</b> Information	Women are motivated at the outset of pregnancy to attain and maintain a healthier lifestyle but report inaccurate and inconsistent health messages <sup>40</sup>	Belief that excessive gestational weight gain was not important to pregnancy outcome	1. Information provided in the groups is evidence-based and presented by a multi-disciplinary team through a series of topics 2. Women involved in the content planning for each session. Debate encouraged by facilitator	Accurate information promoted through: - regular reminders - vicarious learning	Women will report accurate information in terms of healthy eating and activity during pregnancy	1. Consistent messages increased the women's confidence to 'stand their ground' with family and friends in relation to healthy eating and activity 2. Change in family (especially children's) eating habits
<b>CMO 7</b> Support	Women report lack of support (societal and personal) to attain and maintain a healthier lifestyle <sup>41</sup>	No local context identified	1. Continuity of midwifery carer provided throughout pregnancy. 2. Time provided in the group sessions for informal networking	Group culture helped to mitigate negative family attitudes	Women will report that they have received helpful support from the midwives and their peers via group antenatal care	2. Competing personal priorities reduced women's motivation to change their eating and exercise habits

<sup>40</sup> Ferrari, R., Siega-Riz, A., Evenson, K., Moos, M. & Carrier, K. 2013, 'A qualitative study of women's perceptions of provider advice about diet and physical activity during pregnancy', *Patient Education and Counseling*, vol. 91, no. 3, pp. 372-7.

<sup>41</sup> Sui, Z., Turnbull, D. & Dodd, J. 2012, 'Overweight and obese women's perceptions about making healthy change during pregnancy: a mixed method study', *Maternal and Child Health Journal*, vol. December.

CMO	CONTEXT		MECHANISM		OUTCOME	
	Context -- supported by evidence (Chapter 2)	Context – post-interviews	Resources (Planned/tangible)	Reasoning (Barriers/enablers)	Planned	Occurred/unplanned
<b>CMO 8</b> Confidence (women)	Women lack confidence to manage weight gain during pregnancy <sup>42</sup>	1. Previous negative social and healthcare experiences in terms of weight 2. Feeling of fear or horror of putting on more weight during pregnancy	Goal setting and other motivational techniques known to be successful for weight management with non-pregnant populations	Confidence increased by: - Acceptance - enjoyment - achievement - positive reinforcement - sense of control Decreased by: - societal expectations - family control	Women will demonstrate increased confidence in their ability to manage their weight gain by making positive changes in relation to eating and activity	1. Goal setting was not popular with women 2. Increased autonomy in relation to decision making, associated with increased confidence 3. Increased confidence promoted group attendance 4. Confidence to manage weight was harder after the birth of the baby
<b>CMO 9</b> Confidence (health professionals)	Professionals are reluctant to provide weight gain advice to women who are obese due	1. No clinical practice guidelines in relation to gestation weight gain were available	1. Training specific to the care of obese women in pregnancy: - motivational	Confidence increased by: - personal experience of weight gain	Health professionals will report increased confidence and competence in	1. Increasing erosion in confidence to discuss weight and weight gain in

<sup>42</sup> Wiles, R. 1998, 'The views of women of above average weight about appropriate weight gain in pregnancy', midwifery, vol. 14, pp. 254-60.

CMO	CONTEXT		MECHANISM		OUTCOME	
	Context -- supported by evidence (Chapter 2)	Context – post-interviews	Resources (Planned/tangible)	Reasoning (Barriers/enablers)	Planned	Occurred/unplanned
	to perceived lack of confidence in their knowledge and skills <sup>4344</sup>	at the time of the implementation of the intervention to guide practice 2. Minimal experience discussing weight and weight gain with women prior to the intervention	interviewing and communication skills training, - potential complications in pregnancy - lifestyle advice for obese pregnant women 2. Regular de-briefing and support sessions in antenatal clinics and group venues.	- positive feedback - Being able to make a difference - time and practice - behavioural modelling activities (vicarious learning)  Decreased by: - regular 'rotation' or change of staff through the antenatal clinics - negative attitudes towards women who are obese - negative responses from women who are obese - working alone	their ability to provide accurate and consistent information in relation to pregnancy and healthy eating/activity  2. Health professionals will report increased confidence and competence in discussing pre-pregnancy BMI and gestational weight gain with women who are obese	clinics 2. Evidence of women's successful weight management reinforced confidence of group facilitators 3. Increased potential for conflicting advice to obese women from different health professionals (eg anaesthetists) 4. Awareness of own BMI 5. Change in lifestyle behaviour of health professionals and their families

<sup>43</sup> Schmied, V.A., Duff, M., Dahlen, H., Mills, A.E. & Kolt, G.S. 2011, 'Not waving but drowning': a study of the experiences and concerns of midwives and other health professionals caring for obese childbearing women', *Midwifery*, vol. 27, no. 4, pp. 424-30.

<sup>44</sup> Heslehurst, N., Russell, S., McCormack, S., Sedgewick, G., Bell, R. & Rankin, J. 2013, 'Midwives perspectives of their training and education requirements in maternal obesity: A qualitative study', *Midwifery*, vol. 29, no. 7, pp. 736-44.



CMO	CONTEXT		MECHANISM		OUTCOME	
	Context -- supported by evidence (Chapter 2)	Context – post-interviews	Resources (Planned/tangible)	Reasoning (Barriers/enablers)	Planned	Occurred/ unplanned
<b>CMO 10</b> Relationship	Fear of damaging relationship with the woman <sup>45</sup>	No local context identified	Communication 'tools' provided to support health professionals to have conversations about weight and weight gain.	Relationship maintained by: - dissociation with weight gain advice - maintenance of role perception - finding common ground in terms of BMI - developing a routine 'spiel' that normalises weight discussion	Health professionals will maintain positive relationship with the woman through improved communication skills and strategies.	Due to negative feedback from women in the antenatal clinics, written material was preferred to verbal by health professionals

<sup>45</sup> Willcox, J.C., Campbell, K.J., Van der Plight, P., Hoban, E., Pidd, D. & Wilkinson, S. 2012, 'Excess gestational weight gain: an exploration of midwives' views and practice', BMC Pregnancy and Childbirth, vol. 12, no. 102.

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