The Effectiveness of Client-Centered Conversations to Promote Healthy Diets, Physical Activity, and Guideline Concordant Gestational Weight Gain in Pregnant Mothers: A Pragmatic Randomized Controlled Trial

by

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Abstract

Background: To promote healthy gestational weight gain, the Institute of Medicine (IOM) recommends healthcare providers regularly weigh every pregnant woman, and follow with a discussion about gestational weight gain recommendations and healthy lifestyles. Research suggests that healthcare providers consider gestational weight gain to be important yet may not regularly discuss it with women for reasons including: lack of time, uncertainty with how to approach the discussion, fear of losing trust or rapport with the woman, and other systematic and individual-level barriers. Healthy Conversation Skills (HCS), a communication technique, was trialed by a Registered Dietitian (RD), as a means to open a discussion about gestational weight gain and determinants. Healthcare providers trained in HCS aim to support individuals towards healthy behaviour change by utilizing three key communication skills– asking open discovery questions, listening, and supporting goal setting. The purpose of this study was to:

(a) pilot the communication technique, Healthy Conversation Skills, to assist women in adopting and maintaining healthy lifestyle behaviours and weight gain in concordance with national gestational weight gain guidelines and

(b) to evaluate the impact of use of the Healthy Conversation Skills approach on total gestational weight gain, women's lifestyle behaviours, and women's study perceptions.

Methods: Seventy low-risk pregnant women were randomized to an active control (AC) or intervention (INT) group and interacted with their respective RD for two visits and two phone calls. Both RD's administered lifestyle questionnaires and the INT RD created opportunities to discuss healthy behavior changes using HCS throughout the visits, while the AC RD did not. Women also completed a third lifestyle questionnaire via email at 34 weeks. Postpartum, women answered a questionnaire about their perceptions of their prenatal experience. A passive control

group (PC) of women ≤12 months postpartum (n=55) was recruited to only complete the postpartum questionnaire. This group models standard prenatal care in Alberta (no RD visits in pregnancy). Gestational weight gain data was collected from obstetrical charts and adherence to gestational weight gain recommendations was defined in accordance with IOM guidelines.

Results: Pre-pregnancy BMI, ethnicity, education, marital status, household income and parity did not differ between INT (n=33), AC (n=37), and PC (n=55) groups. Total GWG, rate of weight gain and adherence to GWG guidelines did not differ between the three study groups. Between visit 1 (mean gestational age: 16.2±3.8) and visit 2 (mean gestational age: 29.3±1.2 weeks), INT women increased their diet quality score (28.9 ± 7.7 to 34.2 ± 7.2, p=0.0012), while the AC group did not (35.1 ± 9.0 to 36.2 ± 9.4, p=0.5370). At 34.4(0.86) weeks AC women reported being sedentary for 3 MET-hours/week more than INT women (p=0.0073). Postpartum, INT women were more likely to strongly agree that participating in the study "improved at least 1 of my lifestyle habits" compared to AC women (p=0.009). INT women were more likely to strongly agree that participating in the study "was beneficial" (p=0.070) compared with AC women, although the difference bordered on significance. INT women also were more likely to agree or strongly agree that their study RD "asked about things important to me" (p=0.056). Although non-significant, a trend towards significance was found for the INT group more strongly agreeing their participation was beneficial (p=0.070) and their "study RD was interested in them and how the pregnancy was affecting their life" (p=0.077) compared to the AC group.

Conclusion: When a RD initiates a conversation about healthy lifestyles in pregnancy, women report positive outcomes in behaviours related to dietary intake and physical activity. The change in lifestyle behaviours and the higher sense of support from the RD that was reported from the

INT group demonstrates the potential use of HCS to approach, initiate, and continue discussions surrounding healthy lifestyles. Future research is required to determine the effectiveness of Healthy Conversation Skills.

Preface

This thesis is an original work by Laura Mackenzie Adam. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, "Be Healthy in Pregnancy (BeHIP) Pilot Study", Pro00054360, May 26, 2015.

The study was designed by Dr. Rhonda Bell, Dr. Donna Manca and Laura Adam. Laura Adam wrote the study protocol, recruited participants, conducted the study, and completed statistical analysis of the data. Laura Adam was the Registered Dietitian for the Intervention (INT) study group.

Contributions of authors for manuscript based thesis:

Chapter 3 of this thesis was co-authored by Laura Adam and Dr. Donna Manca and Dr. Rhonda Bell. This chapter in total has been published as Adam LA, Manca DP, Bell RC. Can Facebook Be Used for Research? Experiences Using Facebook to Recruit Pregnant Women for a Randomized Controlled Trial. J Med Internet Res. 2016; 18(9):e250**.** doi:10.2196/jmir.6404

In this chapter, Laura Adam was responsible for carrying out the recruitment, data collection, statistical analysis, and for writing the manuscript. The co-authors, Dr. Donna Manca and Dr. Rhonda Bell, served as advisors and provided critical review of the manuscript.

Dedication

This thesis is dedicated to my loving and caring family…

My parents, Randy and Berniece, and my brother, Nolan.

I stand here today because of you three.

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First, I want to offer thanks to my heavenly Father. God, you provide me with strength daily. Within you, I know I will always find a source of support, trust, grace and limitless love.

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I would like to end with a quote from, Dr. *Indira Samarasekera* the 12th president and vice-chancellor of the university. ***"Excellence can be attained if you risk more than others think is safe, care more than others think is wise, dream more than others think is practical, and expect more than others think is possible."*** This quote has, and will continue to inspire me to strive for excellence in my life. My hope is, that I can also use it as a source of inspiration to help others strive for their own excellence.

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List of Abbreviations

AC- Active Control

AHS- Alberta Health Services

ASA24®- Automated Self-Administered 24-hour Recall

BCT- Behaviour Change Theory

BMI- Body Mass Index

DO- Drop-out

EC- Exclusion Criteria

EWCFG- Eating Well with Canada's Food Guide for Healthy Eating

PPAQ- Pregnancy Physical Activity Questionnaire

GA- Gestational Age

GWG- Gestational Weight Gain

HCP- Healthcare Provider

HCS- Healthy Conversation Skills

INT- Intervention

IOM- Institute of Medicine

MI- Motivational Interviewing

NHS- National Health Services

OB/GYN- Obstetrician/Gynecologist

PC- Passive Control

PDAQ- Perceived Dietary Adherence Questionnaire

QPCQ- Quality of Prenatal Care Questionnaire

RCT- Randomized Controlled Trial

RD- Registered Dietitian

SMARTER- Specific, Measurable, Attainable, Realistic, Timely, Evaluate, Review

Chapter 1: Introduction

1.1 Rationale

The developmental origins of health and disease (DoHAD) identify the importance of a healthy lifestyle during pregnancy.[1] Specifically, the lifestyle, including nutritional intake and physical activity behaviours, of a woman prior to and during pregnancy can influence the health of both herself and her offspring long term.[1-4] Thus, pregnancy has been identified as an ideal time in a woman's life to encourage healthy lifestyle behaviours as it can influence the health of two individuals at once.[5] Women report being motivated to make healthy changes in pregnancy as they are considering the health of their child and themselves.[6-8]

The amount of weight a woman gains during pregnancy is one measurable factor that is associated with both short-term and long-term disease risk for mother and child.[5,9-16] Despite Health Canada and the Institute of Medicine (IOM) providing guidance about recommended weight gain during pregnancy, approximately 49% of women in Alberta gain in excess of the current gestational weight gain recommendations.[17] Similar trends have been reported elsewhere in Canada[18-20], and in most developed countries worldwide.[18,21-27] The concept that gestational weight gain (GWG) is a direct reflection of a woman's energy balance – energy in (dietary intake) and energy out (physical activity), overlooks the complexity of GWG. Previous studies have related the amount of weight a woman gains in pregnancy to various demographic factors including age[25,28], ethnicity[24,25,28,29], socioeconomic status[30], parity[30,31] education[24,25,31], medical conditions[24] and pre-pregnancy weight.[17,24,25,28,30,31] Dietary intake and physical activity are potentially two modifiable factors that relate to GWG.[28] There are a multitude of additional behavioural factors including a woman's self-efficacy, knowledge, sense of control of weight, and her social support, that may impact lifestyle behaviours in pregnancy. The knowledge surrounding the impact of these factors on GWG is minimal in the current literature.

During pregnancy, women often have increased interaction with healthcare providers (HCPs).[8] Prenatal care may be provided by a variety of HCPs, including Family Physicians, Registered Nurses, Obstetricians/Gynecologists, Registered Dietitians, Nurse Practitioners and Exercise Physiologists. Within this thesis, the use of HCP is a general term and can apply to any of the HCPs that provide prenatal care to women. Prenatal care may be delivered through various forms including primary care, prenatal classes, and hospital tours. In general, the increased

frequency of engagement with a HCP during pregnancy may provide an opportunity to have discussions about healthy lifestyle choices.

The IOM recommends that HCPs review the GWG guidelines with every woman, and have an accompanying discussion about diet and exercise that is individualized to each woman's life context.[32] In Canada, approximately 75% of HCPs weigh women at each prenatal visit; however, only half of HCPs may relay this information to the woman.[33] Amidst the IOM recommendations to discuss weight with every woman, approximately 42-52% of women report discussing their weight or weight gain.[34,35] Women report that when weight is discussed, it is often in response to excess GWG.[36] In addition, qualitative studies of postpartum women suggest that the lack of discussion of weight or nutrition may create a perception that HCPs are not concerned with GWG, or that weight and nutrition in pregnancy are not important.[36] Studies that include HCP opinions indicate that HCPs are aware of the importance of GWG[37]; however, many of them lack time[38], knowledge, behaviour change skills and confidence to start and continue conversations surrounding GWG, nutrition or physical activity.[37,39,40] HCPs also report viewing this discussion as sensitive and one where trust can be lost if not approached in the right manner.[40,41] Approaches that can address the needs of both HCPs and women are required.

Several studies have been conducted to determine how women believe discussions about health in pregnancy could be improved. Women have suggested that conversations about weight gain and healthy lifestyles should be provided in a client-centered manner.[42] It has been suggested that they want a discussion that is initiated first by the HCP, and want education to be more than a handout to read.[43] Qualitative work from focus groups and face-to-face interviews highlight that women desire to be heard, and want individualized care that is adapted to their life context and stage in pregnancy.[42,44,45] A recent editorial in the area of weight management outside of pregnancy highlights the importance of providing individualized care based on each person's life context since a multitude of personal and environmental factors can be facilitators or barriers to healthy weight.[46] This editorial suggests that HCPs must gain an understanding of each individual's reality in order to provide optimal care related to body weight.[46]

HCPs have reported that short appointment times and their own lack of skills in facilitating behaviour change are barriers to providing nutrition and physical activity counselling within both prenatal care[40] and routine care[47,48]. Yarnall et al suggests that preventative healthcare may be better addressed by a non-physician HCP within the healthcare team who has developed the

skills needed to effectively support behaviour change and whose time is available to patients for longer periods of time, and more regularly.[38] In this respect, the skills of Registered Nurses, Registered Dietitians, and Exercise Physiologists may be important to incorporate within the prenatal care team.

To fill the need for communication techniques to promote optimal GWG using a client-centered approach, a new conversation technique called Healthy Conversation Skills (HCS) was trialed by a Registered Dietitian (RD) in this study. HCS is a client-centered communication technique where a HCP explores the client's world and aims to support and empower the client to initiate behaviour change, through conversation.[49,50] HCPs trained in HCS aim to support individuals towards healthy behaviour change by utilizing three key communication skills– asking open discovery questions, listening more than talking, and supporting goal setting.[49] The current study was conducted as a pragmatic randomized controlled trial (RCT) in which the intervention RD initiated lifestyle related conversations using HCS with pregnant women during completion of a questionnaire. Through conversation, a woman's life context, facilitators and barriers to healthy lifestyles were discussed. When appropriate, individualized goals were made and progress was evaluated during future interactions. The RD leading the active control group of women was not trained in HCS techniques, and did not initiate any lifestyle discussions, nor did she help participants identify any behavior change goals. The active control RD also assisted the participants in completing the same questionnaires as the INT group, but without discussion of lifestyle-related topics. Further details of HCS and the study are discussed in Chapter 4.

Due to multiple HCP-client interactions during pregnancy, it is promising that HCS has the potential to be adapted within current prenatal care. This conversation technique may allow HCPs to feel more comfortable initiating patient-centered, individualized, empowering lifestyle conversations with women during prenatal care interactions. Having practical approaches for HCPs to engage in these conversations with pregnant women may help initiate ongoing supportive conversations about healthy lifestyles.

1.2 Purpose

The purpose of this study was:

a. to pilot the communication technique, Healthy Conversation Skills, to assist women in adopting and maintaining healthy lifestyle behaviours and gestational weight gain in concordance with national gestational weight gain guidelines.
b. to evaluate the impact of a Registered Dietitian using the Healthy Conversation Skills approach on total gestational weight gain, women's lifestyle behaviours, and women's study perceptions.

1.3 Research Questions

The research questions for this study were:

1. What is the impact of a Registered Dietitian's use of Healthy Conversation Skills on women's total gestational weight gain and rate of gestational weight gain?
2. What is the impact of a Registered Dietitian's use of Healthy Conversation Skills on women's lifestyle behaviors?
3. What are the women's overall perceptions and satisfaction with their study participation?

1.4 Objectives

The objectives of this thesis were:

a. To have a Registered Dietitian pilot test the counselling technique, Healthy Conversation Skills, as a communication method to promote appropriate gestational weight gain and healthy lifestyle behaviours.
b. To evaluate the effectiveness of paid advertisements on Facebook as a platform for recruiting pregnant women to a pragmatic randomized controlled trial in comparison with traditional recruitment approaches.
c. To compare the gestational weight gain of women in the intervention group with the active control and passive control groups.
d. To compare perceived dietary intake and physical activity behaviours of women in the intervention and active control groups.
e. To compare the overall perceptions and satisfaction with study participation between the intervention and active control groups.

Chapter 2: Literature Review

This chapter is a review of the literature examining the factors that impact gestational weight gain (GWG) in pregnancy. First, the influence of the obesity epidemic and the complexity of factors that influence appropriate weight gain in pregnancy are reviewed. Second, studies examining the current skills and knowledge of prenatal healthcare providers (HCPs) related to promoting appropriate GWG and healthy lifestyles are discussed. Next, a summary of the behaviour change theories commonly used within GWG studies is reviewed, followed by a focused critical review of the current literature aimed at preventing excessive GWG. Next, Healthy Conversation Skills (HCS) as a communication technique is described and a summary of the research leading to and using this technique is discussed. Lastly, the rationale for the study design is outlined.

2.1 Pregnancy is a Vulnerable Window to Influence Health

Gestation is considered to be one of the most vulnerable periods of life due to the rapid fetal growth and development that takes place in the relatively short period of time.[51] An ever increasing body of evidence consistently shows that suboptimal maternal nutrition (either insufficient or over-sufficient nutrient intake) in pregnancy, can alter disease risk later of the mother and offspring later in life. This theory, known as the Developmental Origins of Health and Disease (DOHaD) has been attributed to the late English researcher, Dr. David Barker. Through a review of birth records from 1911-1948, Dr. Barker's Hertfordshire Cohort showed that males born with low birth weight (2.7 kg) had a 25% higher risk of developing heart disease and a 30% increased risk of stroke in adult life compared to those weighing 4.1 kilograms at birth.[52,53] This intriguing finding has been strengthened by similar findings in many epidemiological cohorts worldwide.[54-56] The concept that the in utero environment programs the fetus and can change metabolism, organ structure, and function permanently to alter disease risk is theory behind DOHaD.[1] Under this hypothesis, alterations in the maternal environment in pregnancy (either induced by nutrition-related and non-nutrition-related factors) influences developmental processes operating at the cellular level which can change the fetus' organ structure, physiology and metabolism.[51,57] This process is known as developmental programming; the changes in gene expression arise from epigenetic mechanisms. Epigenetic

changes are heritable and can alter offspring phenotype and health in later life.[58] There is reasonable evidence that developmental programming may contribute to the rapid increase in obesity seen worldwide.[51] The promotion of optimal maternal health prior to, during, and after pregnancy, is essential to attain the best health outcomes for women and their offspring across multiple generations.

2.2 Gestational Weight Gain

During pregnancy, GWG is used as a global indicator of healthy growth and development of the fetus, as well as maternal health.[27] Weight gain consists of the placenta, fetus, blood, amniotic fluid, uterus, breast and maternal adipose tissue.[27] Total body water, fat, and protein accretion occurs throughout pregnancy in these tissues and others, including several organs such as the kidneys, heart, and gastrointestinal tract.[27]

Recommendations for the amount of GWG that is considered appropriate for optimal maternal and infant health[59] were developed by the Institute of Medicine (IOM) and are based on a woman's pre-pregnancy Body Mass Index (BMI). The guidelines specify a range of total weight gain where the risks for adverse child and maternal outcomes are at a minimum within each pre-pregnancy BMI category.[27,32,60] The most recent Institute of Medicine (IOM) guidelines were released in 2009[32], and adopted by Health Canada in 2010 (Table 1)[60]. The rate of weight gain in the 2nd and 3rd trimester assume that a women gains 0.5-2 kg in the first trimester.[32] The pattern of GWG is sigmoidal, with minimal weight gain in the first trimester (< 2.0 kg) , and a rapid increase in weight gain in trimester two and three with a plateau in late pregnancy as fetal growth slows.[32] The products of conception are a fairly consistent component of weight gain between pregnancies; however, the amount of adipose tissue a mother gains in pregnancy is the most variable component.[61] Recent research shows a positive association between the quantity of adipose tissue gained and total GWG.[61]

Table 2.1: Institute of Medicine Guidelines (2009) for weight gain in pregnancy.[32]

Pre-Pregnancy BMI Category (kg/m^2)	**Total Weight Gain (kg)**	**Weekly Weight Gain in 2nd & 3rd Trimester (kg/wk)**
Underweight (<18.5)	12.5-18	0.5
Healthy Weight (18.5-24.9)	11.5-16	0.4
Overweight (25.0-29.9)	7-11.5	0.3
Obese (≥30)	5-9	0.2

Despite the release of the revised GWG guidelines in 2009/2010, a prospective cohort of 1541 women in Alberta in 2009-2012 found that 33% of women gained within, 17.6% gained below, and 49.4% exceeded their respective guidelines.[17] Weight gain in excess of the guidelines has been noted by other researchers in Canada[18,19,62], and has also been reported in many developed countries worldwide.[18,21-26,63] Since excess GWG is also associated with postpartum weight retention, pregnancy itself has been identified as a risk factor for maternal obesity later in life.[64] In the case of multiple pregnancies, excess weight gain in each pregnancy, followed by postpartum weight retention could result in higher maternal weight when entering a subsequent pregnancy.[3] This may increase the risk of complications in subsequent pregnancies.[3]

It is also important to note that low maternal weight gain in pregnancy is also a concern.[65] Maternal weight gain below the recommendations is associated with increased risk for preterm birth and delivery of a small-for-gestational age or low birthweight infant.[60] It has also been associated with higher rates of infant mortality and morbidity, adverse physical and cognitive issues, and long term health problems in the offspring.[60] Insufficient weight gain can arise due to a host of reasons including low maternal nutritional and caloric intake, poor fetal growth, poor growth and development of the placenta, lack of plasma volume expansion.[27] Inadequate GWG is certainly problematic; however, this thesis will focus on the issue of excess of weight gain due to the high numbers of women who experience GWG in excess of the guidelines in developed countries.

2.3 Consequences of Excess Gestational Weight Gain

When a woman gains weight in excess of the guidelines, adipose tissue is typically the main component of the excess weight gain within the mother.[61] In the short-term, excess weight gain is associated with an increase in maternal risk for hypertension in pregnancy[66] and gestational diabetes.[67] At delivery, there is increased risk for emergency Caesarean section[68] and delivery of a large-for-gestational age infant[69]. Several studies have started to examine long-term outcomes for different amounts of GWG.[3,5,11,70] The Avon Longitudinal Study of Parents and Children (ALSPAC) is a prospective study of 14, 541 pregnant women in the United Kingdom that has collected outcomes during pregnancy until 16 years after pregnancy (as of the current date). Of the 2356 mothers followed long-term, women who gained excess GWG in their pregnancy had a greater mean BMI, waist circumference, and central adiposity, 16 years later.[13]

A study conducted in Australia followed a sample of 2055 women long-term (from an original cohort of 7223 women). Independent of confounders, of the women who gained weight in excess of the 1990 IOM guidelines, had higher odds of being overweight (OR: 2.15; 95% CI: 1.64-2.82) or obese (OR: 4.49; 05% CI: 3.42-5.89) 21 years after the pregnancy that initiated their study participation. Studies that follow women long-term are only beginning to emerge and will be of great value to the literature in this area.

Long-term findings from the ALSPAC study found excess maternal GWG was also associated with greater adiposity and adverse cardiovascular risk factors for the child at age 9 years.[12] Considerably more evidence is available linking long-term outcomes of excess GWG on the child. These include greater risk of adiposity[71], greater BMI[5,12,14,72], and increased odds for childhood obesity[9,73]. With the global health concern over rising obesity rates[9], promoting appropriate GWG could be one initiative that positively modifies the obesity risk of two individuals at once.[5] A 2016 World Health Organization report highlights the promotion of appropriate GWG and adequate nutrition during pregnancy as one of the 6 key recommendations to combat childhood obesity.[74]

While total GWG is important, recent research also points to the timing of weight gain as an important point to consider. The pattern of weight gain in a pregnancy may be related to the nutrient and uterine environment available to support growth.[75,76] Early in pregnancy, metabolic processes, organogenesis and placentation occur; these in utero events are vulnerable to available nutrient supply.[57] Alterations in these processes can adversely affect placental nutrient and hormone transfer, thus negatively impacting fetal growth.[77] Differences in GWG patterns across trimesters appear to be related to different weight-related outcomes for the offspring. For example, a study of 977 mother-child pairs in Greece, shows that for each 200 gram/week of maternal weight gain in the first trimester was associated with increased risk for overweight/obesity for the child at age 2-4 years.[78] In contrast, the same weight gain in trimester two and three was associated with increased risk for large-for-gestational age infants, but was not associated with higher weights in childhood.[78] Another study found higher rates of GWG in the first and second trimesters was associated with higher BMI z-scores and adiposity in mid-childhood, while third trimester GWG had no relationship to childhood obesity.[79] Other studies have found excessive weight gain in the first trimester to be associated with greater birth weight[80], excessive body fat[80], and increased odds of child being overweight at age 5[81]. For the

mother, a positive association between an increased rate of weight gain early in pregnancy and her risk for gestational diabetes has also been found.[67] Rate of weight gain more than the total weekly recommendations for weight gain in the second and third trimester has been related to higher accretion of maternal adipose tissue.[75] Ultimately, positive health outcomes are observed when women gain within the recommended rate of weight gain and within the total recommended GWG for their pre-pregnancy BMI.[75,82]

2.4 Maternal Obesity Prior to Pregnancy: Consequences and Complications during Pregnancy

As of 2014, global estimates from the World Health Organization show that approximately 40% of adult women are overweight or obese worldwide[83], while ~59% women of American women of childbearing age are overweight or obese.[84] Since overweight and obesity is associated with increased lipogenesis, inflammation and decreased insulin sensitivity, women who enter pregnancy obese have an increased risk for adverse outcomes compared with those who enter pregnancy within a healthy BMI range, regardless of their total GWG.[85] The prenatal complications of maternal obesity include gestational diabetes[15,86] reduced iron status[87], and gestational hypertension[15,86]. At delivery, there are a number of adverse complications that can occur and women are at increased risk for a medically-induced preterm delivery[15,86,88], premature or preterm membrane rupture[88], scheduled and emergency Caesarean section[15,86,89], while their infants are at increased risk for being large-for-gestational age[15], having low iron status[87] and infant death[90]. Over the long term, children who are born to mothers who are overweight or obese prior to pregnancy have increased risk for severe asthma at age 7[91], wheezing[91], impaired cognition at age 10[92], delays in early fine motor development[93], expression of adverse cardiometabolic risk factors (i.e. higher abdominal fat mass, systolic blood pressure, insulin levels and lower levels of HDL cholesterol)[16] and overweight and obesity in childhood[16,71,88] that may extend long-term.[88]

From an economic perspective, the cost and use of healthcare services is high for women who enter pregnancy overweight or obese, regardless of their total GWG.[94] In addition to medical complications, women who enter pregnancy obese also report experiencing higher anxiety levels[95], and reported feeling judged, embarrassed, and guilty.[96,97] Washington Cole et al reviewed 117 audio-recorded prenatal visits conducted by nurse practitioners or physicians (both resident and attending) in Baltimore, Maryland, and found that, when visits were categorized by

woman's pre-pregnancy BMI, there was a significant difference in quality of communication between HCP and the woman.[98] When care was provided to women who were overweight, prenatal HCPs asked fewer lifestyle questions, asked clients to reflect their understanding of discussion less, and used fewer approval and concern statements.[98] For women who were obese, the HCPs delivering the prenatal care provided less lifestyle information and fewer self-disclosure comments.[98] A recent meta-synthesis of 6 qualitative studies found that women with an obese pre-pregnancy BMI perceive their pregnancy as a more medicalized experience rather than a personal experience.[96] Overall, the literature suggests that care may be different among women with different pre-pregnancy weight statuses. There could be a need to ensure that all women experience a personalized approach to care during pregnancy while making sure that their medical needs are also addressed.

2.5 The Multitude of Factors Affecting Gestational Weight Gain

Reducing the number of women that gain in excess of the guidelines is likely to improve the prevalence of the short and long-term adverse complications as outlined above.[30] The number of factors that influence GWG in pregnancy is diverse and they are likely to interact in complex ways. Figure 2.1 (Hill et al, 2010) illustrates this point. This conceptual model, designed by Hill et al, is grounded in behavior change theory and based on current findings from the GWG area.[99] The discussion below reviews and expands on factors that are associated with GWG, and includes some of the factors this figure illustrates.

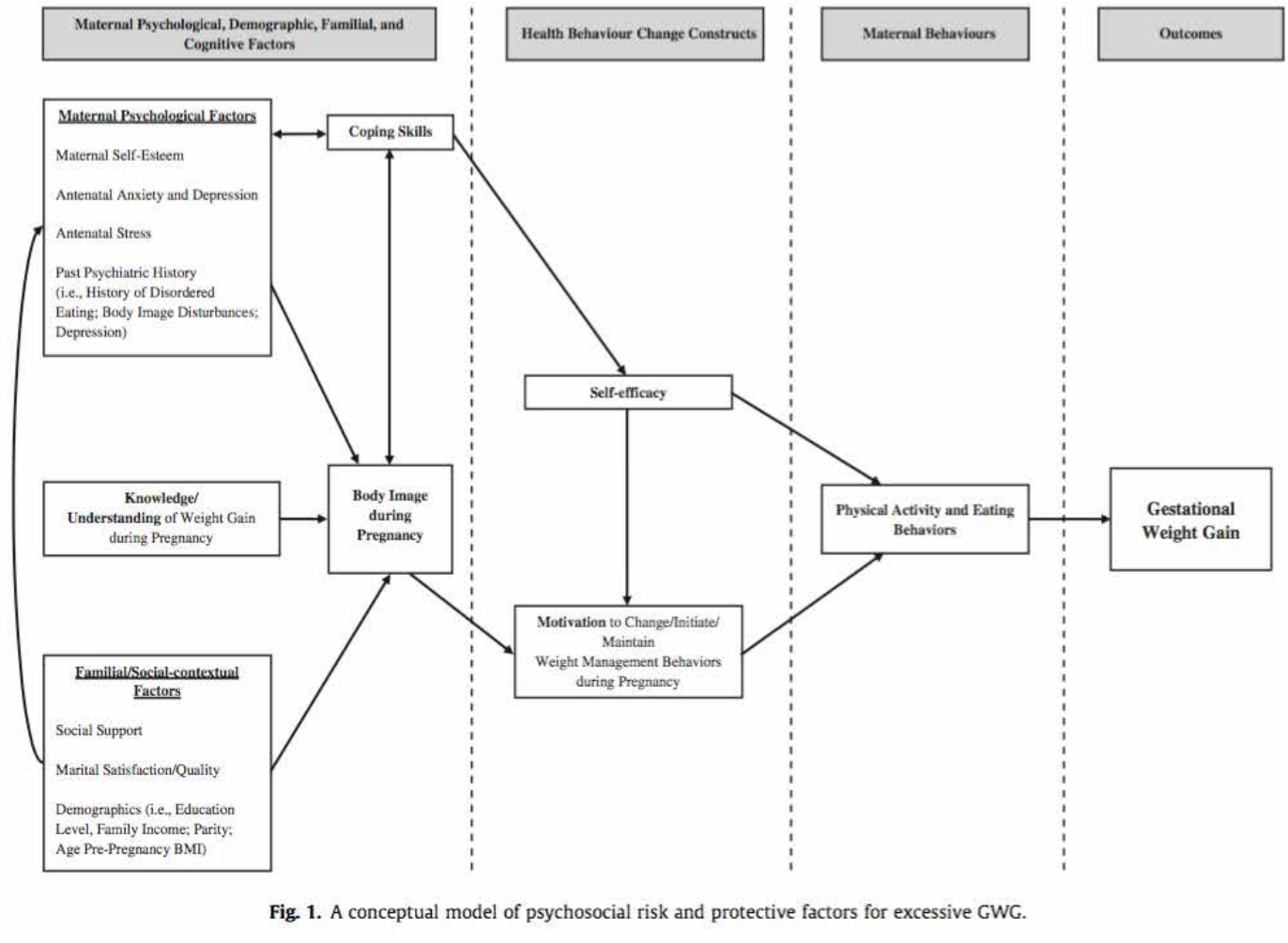

Figure 2.1: Factors that contribute to gestational weight gain in pregnant women.
Used with permission. Previously published in: Hill B, Skouteris H, McCabe M, et al. A conceptual model of psychosocial risk and protective factors for excessive gestational weight gain. *Midwifery.* 2013;29(2):110-114.

Diet

Dietary recommendations in pregnancy include following *Eating Well with Canada's Food Guide*[100], an additional 340-450 kilocalories in the second and third trimester (which is approximately 2-3 servings from any food group), and daily intake of a prenatal multivitamin.[101] Although the "eat for two" concept is diminishing, some women view pregnancy as an opportunity to eat what they want.[102] One observational study (Iceland) and three cohort studies (USA) have reported that higher caloric intake is positively associated with total GWG or increased risk for excess GWG.[28,103-105] A prospective cohort study observed that daily intake of three or more servings of vegetables and fruit is associated with less total GWG.[105] These results suggest that calorie intake and the source of calories are both important contributors to GWG in women in developed countries.

Eating is a complex behaviour influenced by physical, physiological, social, cultural and policy-related factors.[106] During pregnancy, some of the physical and physiological changes that accompany pregnancy include changes in food cravings, food aversions, appetite changes, hyperemesis of pregnancy, and fatigue.[102,107] These factors have been found to both limit or increase an individual's daily calorie intake.[102,107] Secondly, cultural factors[108,109] and the social determinants of health such as housing, income[79], food availability, food accessibility, food costs, and food quality can impact diet, and thus impact GWG.[101,108-110] Lastly, pregnant women also report social settings (i.e.: office, parties, family events etc.) to have an influence on diet due to peer pressure and a 'feeling of being watched'.[102] With the multitude of physical and social factors acting as barriers or facilitators for healthy eating, dietary intake is viewed as a modifiable risk that influences total GWG.[28] A 2011 systematic review with meta-analysis of data from 13 studies examined the effects of dietary interventions on total GWG in healthy normal, overweight or obese pregnant women greater than 18 years of age.[111] Included in Tanentsapf et al's analysis were 10 RCTs and 3 quasi-randomized controlled trials, with the aim to prevent excess GWG.[111] The dietary interventions utilized by these studies varied with respect to their intensity, and frequency of interaction. Some of the studies focused on education about healthy eating in pregnancy, to providing women with prescribed diets that were low in fat and carbohydrates, promoting reduced calorie intake to 1200, 1250 or 1500-2000 kilocalories per day.[111] Overall, 10 of the studies were included in the pooled estimate of effect size (n=1434), and the authors concluded that participation in a dietary intervention (of varied methods) resulted in an average 1.92 kilogram overall reduction (95% CI = 0.19 to 3.65 reduction) in absolute GWG compared to a non-intervention comparison group.[111] The authors stated that dietary interventions aimed at preventing excess GWG resulted in a clinically relevant reduction in total GWG.[111]

Physical Activity

Along with diet, physical activity is also considered a modifiable behaviour that can positively affect GWG.[28] The Society of Obstetrics of Canada recommends that all women with uncomplicated pregnancies exercise 3-4 times a week for 30-40 minutes at a time.[112] Physical activity guidelines for pregnancy indicate that participating in physical activity during pregnancy help women to maintain cardiovascular fitness and muscle strength that can help with ease of labour.[112] Higher amounts of physical activity are associated with lowered risk for excess

GWG[105,112], gestational diabetes[112], hypertension[113] and macrosomia[113]. Studies note that many women reduce their physical activity in pregnancy.[28] Barriers that women identify to physical activity include lack of childcare[108,114] , full time work[114], lack of places to exercise due to weather and/or safety[110,115], fatigue[115], lack of support from others[115], and beliefs that it will harm the infant[115]. The Project Viva cohort of 1388 women in the Boston, MA area found that women who participated in vigorous physical activity during the second trimester of pregnancy were more likely to gain within the IOM guidelines for GWG.[28] In this cohort, an inverse trend was found between 30 mins of daily walking and excessive GWG.[28] Greater physical activity in pregnancy has also been associated with reduced risk for gestational diabetes.[116] Overall, physical activity has positive health benefits that must be promoted for all women with uncomplicated pregnancies.

Demographic Characteristics

Many maternal demographic characteristics have been associated with total GWG. The characteristics include age[25,28,105,117], ethnicity[24,25,28,29,117], socioeconomic status[30,109,110], income[87,105], parity[30,31,105,117], education[24,25,31,117] and marital status[117]. The pre-pregnancy factor of pre-pregnancy BMI has also been related to total gestational weight gain.[17,24,25,28,30,31,118]A longitudinal cohort study of pregnant women in the San Francisco Bay area asked women to complete 3 diet and weight gain related surveys in pregnancy, and provide permission to review their medical chart.[118] Brawarsky et al categorized outcomes collected into 3 groups: 'demographic factors' (age, ethnicity, education, parity, height, pre-pregnancy BMI, diabetes and hypertension prior to pregnancy), 'prenatal medical conditions' (medical complications requiring bedrest, frequent nausea or acid reflux in trimester 3, gestational diabetes, pregnancy-induced hypertension and high stress) and 'modifiable factors' (weekly servings of specified foods, caloric intake, exercise, smoking status during pregnancy and provider advice about GWG).[118] The authors analyses indicated that 'demographic factors' accounted for 74% of the variance in excessive GWG.[118] The other 2 factors, 'prenatal medical conditions' and 'modifiable factors' accounted for 15% and 11% of the variance, respectively.[118] This finding underlines the potential influence of demographic characteristics on a woman's GWG. The precise nature of the influence could be direct or indirect. For example, ethnicity is a demographic characteristic that may influence beliefs about ideal weight or desirable body shape.[117,119] If the cultural norm

differs from health recommendations, it is possible this could be a contributing factor towards excess GWG. This highlights the value individualized care may have.

Psychosocial Factors

Research on the impact of psychosocial factors including motivation, mood, body image, coping skills, pre-pregnancy sense of weight control and self-efficacy on GWG is growing.[99,120] Olson et al carried out a prospective cohort study and examined the relationship between women's locus of control, self-efficacy, attitudes about weight gain and motherhood, career orientation, social support and the influence of these perceptions/psychological traits on GWG.[105] There was a weak association (<0.01) between three of the psychosocial variables examined and GWG.[105] Further, Hinton et al found positive relationships between exercise self-efficacy and physical activity in pregnant women, a factor that could ultimately influence GWG.[121] Hill et al suggests that psychosocial factors influence factors along the pathway towards GWG (Figure 2.1).[99,105] Through a review of the GWG literature, Hill et al developed a conceptual model that highlights the large number of factors that may contribute to GWG.[99] This proposed model is grounded in behavior change theory and was based on current findings from the GWG area.[99] The model suggests that psychosocial factors such as stress, anxiety, self-esteem, depression, coping skills and body image could all influence GWG (positively or negatively) by acting through dietary and physical activity behaviors (Figure 2.1).[99] In addition, self-efficacy and motivation are important cognitive precursors when making a behavior change. Increased self-efficacy and motivation for a specified behaviour have been shown to increase the likelihood an individual will adopt a healthy change in a specified behaviour.[99] It is critical to consider and assess these factors in future GWG intervention studies.

Knowledge

A cross-sectional study of 338 pregnant women in Atlanta, Georgia found women who accurately reported their GWG recommendation where more likely to gain within the guidelines.[122] Identification of their correct pre-pregnancy BMI category was also associated with guideline concordant weight gain.[122] These findings are important since they suggest that women's knowledge of the guidelines could be an important determinant of guideline-concordant GWG, and highlight that women's knowledge of their own pre-pregnancy BMI could

also be important to interpret the recommendations appropriately. Interestingly, a woman's awareness or knowledge of her pre-pregnancy BMI category seems to differ by weight status. In a Canadian cross-sectional study of 117 pregnant women show that 33% of underweight women overestimate their pre-pregnancy BMI, and 50% of overweight and 90% of obese women underestimate their BMI.[123] Consequently, the upper limit of the appropriate GWG range was underestimated by 50% of underweight women and overestimated by 85% and 100% of overweight and obese women, respectively.[123] An American study found similar results as only 162 of 338 (48%) pregnant women correctly identified their pre-pregnancy BMI category.[122] Thus, knowledge of the GWG guidelines may not be personally useful if the woman is unaware of her own weight status. Although knowledge is one factor that may contribute to healthy behaviours, education alone is not sufficient to create change in unhealthy behaviours such as poor eating habits[124] or smoking.[125] Additional supports are needed for individuals to change.

Social Support

Social support appears to be an important determinant of guideline-concordant GWG.[105] In a study of 622 healthy pregnant women from Upstate New York, underweight, normal and obese women who reported lower levels of social support gained on average 1.3 kilograms ($p<0.01$) more during pregnancy than those who reported higher levels of social support.[105] The level of social support was assessed by questionnaire in which the researchers asked women to report their access to, and frequency of help from others.[105] Women, particularly those from ethnic minority backgrounds, stated that the role of social support was an important influence towards healthy well-being in pregnancy.[108] Social networks influence the beliefs and behaviours of an individual.[108] In a qualitative study of Latino women living in the United States, husbands were the main support of influence for issues surrounding weight, dietary intake and physical activity.[108] Secondary support sources that influenced weight, diet, and physical activity included female friends, and family members.[108] The support of HCPs was reported to be an influence for the topics of weight and physical activity.[108] These authors suggest that support from others can have a positive[108] or negative[102,119] influence towards minimizing excess GWG. Recognizing the influence of social support and leveraging the positive supports a woman has could be an important target for supporting women to have healthy pregnancies.

Self-Efficacy

From the behaviour change literature, self-efficacy is a key component of many theories, including the social cognitive theory.[99,126,127] Self-efficacy can be defined as "one's confidence in their own ability to make a change in behaviour" and is a strong predictor of performing a given behaviour.[126] If an individual has more confidence to carry out a healthy behaviour, there is a greater chance they will make a change amidst the barriers that may exist.[126] Hill et al proposed a theoretically designed model for GWG (Figure 2.1) that suggests the influencing factors of knowledge, social support/demographics, and psychological factors on GWG are partially mediated through self-efficacy.[99] Maternal self-efficacy in regards to weight, and healthy eating have been found to influence the lifestyle behaviours a woman feels are worthwhile to try in the future.[128] Lipsky et al enrolled 622 healthy pregnant women in a population-based cohort study in rural Upstate New York (Basset Mothers Health Project).[128] Women who had greater self-efficacy for healthy eating (prenatal and postnatal) had lower maternal weight from early pregnancy to 24 months postpartum.[128] Further, women who reported control of their weight in the pre-pregnant state, were also more likely to have a higher sense of self-efficacy towards appropriate GWG.[99,128] Further, from a smaller subset (n=498) of the same cohort of women, it was found that pregnant women with higher exercise self-efficacy were more likely to have higher rates of physical activity.[121] Although there is some debate among researchers as to the direction of this relationship, and whether self-efficacy is a cause, or a consequence of successfully carrying out a behaviour, the general consensus is that success and self-efficacy for a certain behaviour operates in a feedback loop.[129,130] Often, self-efficacy is shaped by previous successes or failures the individual experienced in performing that behaviour.[128] Proposed contributors to self-efficacy for healthy GWG can be seen in Figure 2.1. Ultimately, improving the self-efficacy for weight, healthy eating and physical activity of women may be a key aspect with the potential to prevent excessive GWG.[99,128]

Conclusion

In conclusion, the above descriptions frame the complexity of GWG. GWG is multifactorial. Factors include the physical and social environment, physiology of pregnancy, social determinants of health, lifestyle behaviours before and during pregnancy, psychosocial factors, and cultural beliefs can all contribute to GWG. Better appreciation and consideration of

the complexity of the factors influencing GWG can help inform efficacious and appropriate interventions to prevent excess GWG.

2.6 Current Practice of Prenatal Healthcare Providers in Relation to GWG

After the release of the 2009 IOM guidelines, recommendations as to how HCPs should use the guidelines followed.[32,131] It includes:

- Working in a partnership with the mother
- Recording and charting weight gain at all prenatal visits
- Discussing the results with the mother
- Counselling the mother about nutrition and physical activity
- Counsel in an individualized manner that is adapted to each woman's life context
- Referring the mother to other members of the interdisciplinary team (i.e.: dietitians, exercise specialists), if necessary

In Canada, approximately 75% of HCPs report weighing women at each visit, however only half may relay this weight on to the woman.[33] It is well-known that routine weighing alone is not sufficient to assist women in gaining guideline concordance GWG. A recent randomised controlled trial in Australia found that routine weighing of women throughout pregnancy did not significantly improve the number of women achieving gaining guideline concordant weight gain.[26] A systematic review and meta-analysis published in 2017 further confirmed these results.[132] HCPs have reported that they are aware of the importance of this discussion[37], however they describe a lack of time, knowledge, behaviour change skills and confidence to start and continue a conversation surrounding GWG and healthy lifestyles.[37,39,40,133] They also perceive this discussion as sensitive and one where trust could be lost if not approached in the right manner.[40,41,134,135] This concern for sensitivity is especially heightened if a woman is overweight or obese entering pregnancy.[134,135] A method needs to be found that helps HCPs become more comfortable with sensitive discussions.[40]

Women's perspectives of HCP practices within prenatal care also expose the fact that communication about GWG guidelines may not be optimal. After the adoption of the 2009 IOM guidelines, data from a prospective cohort study in North Carolina found 51.8% of women were

told by their HCP how much weight to gain in pregnancy. In Hamilton, Ontario, Canada, a cross-sectional survey of 310 pregnant women found 28.5% (95% CI: 23.5-33.6%) of women reported receiving a GWG recommendation, while only 12% (95% CI: 8-16.1%) received a recommendation that aligned with the 2009 IOM guidelines. An additional limitation of this guideline dissemination is that women reported receiving inconsistent messages from different HCPs, and thus, sought information out themselves, used 'common sense', listened to their body and/or listened to family or friends' advice.[99,136,137] Few women reported having a discussion surrounding the implication of the number on the scale.[33,34,36] Through semi-structured interviews with overweight and obese postpartum women in Pennsylvania, USA, it was found the lack of discussion about weight or nutrition creates a perception that HCPs are not concerned with these issues and that weight and nutrition in pregnancy are not important.[36] Currently, a gap remains for discussing GWG in routine care.

2.7 Prenatal Visits: An Opportunity for Ongoing Support for Healthy Lifestyles in Pregnancy

The purpose of prenatal care is to monitor maternal and fetal health throughout pregnancy with the aim to reduce adverse outcomes, and to support the woman's medical, social and psychological needs.[138] It is routine in Canada for a woman to visit a HCP ~13 times during pregnancy[139]. Generally, women visit their HCP every four weeks until they are 28 weeks gestation, where the visits then happen on a bi-weekly or weekly basis. Usual care in Canada begins with a family physician and the transfer of care often occurs to an obstetrician half way through pregnancy. However, it should be noted that this is often not consistent and may differ by region or urban vs rural setting. Regardless, pregnancy presents a time in a woman's life where she has increased interaction with HCPs. Prenatal care may be delivered through various interactions including primary care, primary healthcare, prenatal classes, and hospital tours. These various interaction points provide HCPs an opportunity to interact with women on a routine basis over a relatively short period of time. The increased interaction frequency could be utilized to discuss healthy lifestyle behaviours as many pregnant women are more motivated to adopt and maintain lifestyle behaviours in pregnancy for the health of their child and themselves.[6-8] Hence, pregnancy is often viewed as a "teachable moment".[140] However, best approaches HCPs can use to optimally support women to improve their lifestyle behaviours within prenatal visits remains unclear.

When women are asked about the topic of GWG and their experiences within prenatal care, women indicate that they trust their HCP on the topic of GWG and would like HCP assistance in obtaining this health knowledge.[136] Research shows that women who receive advice on weight gain, physical activity and/or nutrition from their HCP have higher intentions to make positive changes in behaviours.[141] According to the theory of planned behaviour, a person's intentions to conduct a behaviour is a strong predictor for performing the actual behaviour.[142] However, the extent to which receiving HCP advice actually helps women change behaviours has not been well-defined thus far.[141] In a prospective cohort study of 1454 American women, 52% of women self-reported receiving weight gain advice, and of those, 91% of women reported following the advice.[34] In turn, those who reported following the HCP advice had a significantly lower risk of excessive GWG after controlling for ethnicity and BMI.[34] More research is needed to replicate these findings.

In traditional healthcare models, HCPs inform and provide information to the patient, as the HCP is the expert.[136] However, there is growing appreciation for including a patient perspective in provision of healthcare since the patient is the expert in their own life and can add valuable context to any discussion about personal health.[143] Person-centered or client-centered care has been related to positive outcomes beyond the GWG realm, including increased client self-efficacy, adherence to treatments, and improved medical outcomes.[50] Understanding the client's attitudes, knowledge level, beliefs, intentions, preferences and goals are of great value for helping the HCP tailor care. Findings from clinical care of people with diabetes showed that when nurses communicated diabetic guidelines without the consideration of the patient's circumstances, patients felt disempowered to problem solve.[143] The authors concluded that for appropriate health management, one's life circumstances and one's clinical diagnosis must be not be separated, but considered together.[143]

It is recommended that HCPs discuss GWG with every woman, at most visits.[32,131] Approaching this discussion in a client-centered manner could be valuable and effective in supporting each woman. Timing and frequency of discussions about weight and lifestyle behaviours is also important. Discussing GWG as early as possible is a 'proactive' counselling approach, and is likely to be more effective than a 'reactive' counselling approach that takes place after it is likely too late for behavioural changes to positively impact the health outcome (e.g. after excess GWG has occurred).[37] Regular, client-centered conversations during routine

prenatal care offer an ongoing opportunity to focus and personalize care to the varying needs women have throughout pregnancy.

HCPs desire to help women and provide the best care, however, many have voiced a need to improve communication skills when discussing the topic of weight and nutrition.[37,118] Lessons learned from how HCPs broach and discuss other sensitive topics in a healthcare practice can inform this topic. Chang et al asked women who had experienced intimate partner violence about their concerns with discussing their situation with HCPs, and to provide suggestions of how these discussions could be improved.[144] Women expressed concern when HCPs brought it up unannounced as they feared the HCP was providing judgement to their life context.[144] Women recommended that HCPs offer a reason for bringing up the discussion, normalize the discussion, emphasize they can help, and keep the discussion open and supportive.[144] Applying these findings to discussions about GWG within prenatal care would suggest that HCPs normalize the discussion of weight gain with every woman, as often and regularly as possible. It is instrumental to find care approaches that strengthen communication between HCPs and women.

2.8 Behaviour Change Theories Used in GWG Intervention Studies

For HCPs to best support women, it is important they understand what is important for someone to make a change in behaviour. Merriam-Webster defines 'behaviour' as "the response of an individual, group or species to its environment".[145] Lifestyle behaviours of an individual over their lifetime shape their own long-term disease risk.[146] The fetal environment in utero is a vulnerable period of influence when the mother's behaviours have the potential to shape the child's short- and long-term health.[1] As previously discussed, pregnancy is a time when women often have increased motivation to adopt healthy behaviours[147], this therefore, may represent a key opportunity to be capitalized on. In the last decade, many interventions have tried to decrease excessive GWG with limited success. It is recommended that future GWG studies are designed with the theoretical underpinnings needed for behaviour change.[148]

There are many theories that exist to explain the precursors required for an individual to make a change in behaviour. The GWG literature underlines the need to design interventions using behaviour change theory (BCT) to best understand the factors that contribute to excess GWG.[99] The most common theories of behaviour change that have been applied to health behaviours include: social cognitive theory[126], health belief model[149], transtheoretical (stages of

change)[150] and the theory of planned behaviour[151]. A review article by Soltani et al found that the aspects involved most commonly in successful GWG intervention trials were 'feedback and monitoring', 'shaping knowledge', and 'goals and planning'.[152] All GWG interventions that were successful in reducing GWG reviewed included at least one of these aspects. Based on the current literature, it is not possible to identify the most successful combination of behaviour change elements. Nor is it possible to discern whether some approaches are best suited to particular populations of women. More detailed descriptions of the behaviour change techniques used by an intervention, and the extent to which women adopt, and adhere to the intervention would be useful to move this field forward. At the moment, however, it is difficult to compare between studies and to determine which aspects of an intervention contributed to or impeded success.[152]

For an individual, a desire to adopt a change in behaviour arises from two factors: motivation and self-efficacy.[99] In non-pregnant populations, studies designed to increase motivation and self-efficacy have resulted in an increase in participants' confidence and willingness to make a behaviour change, which has also translated into actual change in behaviour.[99] For an individual to feel motivated to make a change, they must feel ready and understand the value of the change.[99] According to the self-determination theory, if motivation for changing a behaviour comes from within them self (intrinsic motivation), there is a greater chance an individual will successfully change and sustain the change, compared to when an individual is acting primarily based on extrinsic motivation (externally-driven goals).[153] This suggests that interventions in which a women guides the session topics and creates goals may be more likely to succeed than those where goals are prescribed by someone else.[154] Finding methods to enhance and support maternal motivation, self-efficacy, confidence and readiness to change are important aspects for GWG interventions to consider.

2.9 Interventions Aimed at Preventing Excess Gestational Weight Gain

There is a growing body of evidence for interventions to prevent excess GWG. Recent systematic reviews and meta-analyses suggest that interventions promoting healthy eating during pregnancy may reduce weight gain by 2-3 kg and may also reduce rates of pregnancy-related complications.[128,155-157] These reviews note a limitation in clearly defining the best practices in this area since the studies included vary extensively due to the differing demographic

characteristics of their participants, time frame for intervention delivery, approaches to interacting with women, and the extent and type of clinical data collected. Data collection tools also vary across studies, especially with respect to the methods used to assess dietary intake, dietary behaviours, and physical activity. Further, the measure of success relative to GWG differs. Some studies compare absolute total GWG between intervention and control groups, while some studies categorize as per IOM guideline concordance. The lack of standard study design and the heterogeneity of findings underline the need for further research using comparable approaches, evaluation tools, and criteria for success.[128,155-157]

Of the GWG interventions, there is a diverse set of trials that aim to reduce excess GWG. Interventions include dietary counselling[158,159], tailored text messages with feedback[160,161], mailed newsletters with diet self-monitoring, education on GWG guidelines and prescribed exercise[162], weight & physical activity books[163], video doctor support[164], pre-determined nutrition and/or physical activity goals[161,165,166] and provision of probiotic supplements coupled with dietary counselling[167]. Many have been reviewed in previous systematic reviews.[128,155-157] Since there are many studies examining the effectiveness of different types of interventions and its impact on GWG, the critical review of the literature in this thesis focused on aspects of studies that could help inform considerations for design of future interventions that include an individualized intervention, and/or is theoretically grounded in behaviour change. Studies included in the critical review of this thesis met the following criteria: 1) published within the last 10 years; 2) a primary objective to prevent total GWG in excess of the IOM/Health Canada guidelines; 3) the intervention included a dietary and/or lifestyle component that was individualized or grounded in a behaviour change theory, and (3) total GWG was an outcome.
After applying these criteria, 8 manuscripts from 7 studies were included (2 manuscripts from the HIPP study were included).[120,168] One of the studies was conducted in Winnipeg, MB, Canada[169], while the remaining studies were conducted in the USA (2)[161,170], Australia (1)[120,168], Belgium (1)[95], Finland (1)[171] and Sweden (1)[172]. The following aspects of the studies will be compared: study design, timing of recruitment and study visits, criteria for inclusion, approaches used in the interventions, the inclusion of behaviour change theory, and the methods utilized to assess improved lifestyles.

Study Design

Of the studies included, one was a prospective case control intervention study[172], one was a pilot-controlled trial[171], while the remaining five were randomized controlled trials in design. Of the studies reviewed, Claesson and Kinnunen were the only two studies without randomization.[172, 171] The number of participants ranged from n=66-401. Further, a common limitation for GWG intervention studies is the difficulty in blinding participants to their study allocation. None of the studies reviewed appeared to have blinded participants to their intervention allocation. This is a limitation as it may lead to participant bias and could potentially impact the interpretation of the results discussed further below.

Timing of Recruitment, Study Visits and Criteria for Inclusion

Each of the studies recruited women of a different gestational age and with a different weight or BMI criteria. The gestational age at recruitment ranged from 8-26 weeks across all of the studies, although most (5/7) recruited women up to and including 15-16 weeks gestation. Kinnunen et al's recruited women at 8 weeks of pregnancy and their study visits began between weeks 8 and 9 weeks of gestation.[171] The last study visit occurred between 36 and 37 weeks gestation. The intervention consisted of 5 visits that included individualized counselling on nutrition and physical activity delivered by a public health nurse.[171] In contrast, the study by Hui et al enrolled women up to 26 weeks gestation and each woman in the intervention group had 2 study visits, with the visits separated by a two month interval.[169] The HIPP study delivered their health coaching intervention through an person interaction at 20 weeks gestation, followed by phone follow-ups at 27, 30 and 32 weeks. At week 23 and 25, women participated in a 2 hour group education session.[120,168] The mean number of visits women in Claesson et al's intervention group attended was 22.1 thirty minute motivational visits.[172] In contrast, Bogaerts et al's intervention consisted of 4 group lifestyle sessions[95] and Phelan et al had one face-to-face visit, and three follow-up phone calls (extra interactions provided if weight not tracking properly).[170] Herring et al was the only study to not include any in-person interactions, with health coaching occurring bi-monthly over the phone.[161] The gestational age at which these interactions occurred were not specified in the manuscripts. It has been suggested that initiating an intervention early in pregnancy is optimal. Starting an intervention later in pregnancy may limit its effectiveness, as women could have already gained weight in excess of the guidelines. Since it is recommended

that pregnant women not lose weight[27], this could make it difficult for women to gain within the GWG guidelines by the end of pregnancy. Overall, the quantity of engagement of the interventions differed substantially from only phone calls to weekly in person meetings, making it a challenge to compare interventions.

With respect to recruitment criteria, two studies included women with a pre-pregnancy BMI within the obese category,[95,172] one study included women with a pre-pregnancy BMI between 19.8-40 kg/m^2,[170] while the remaining studies did not exclude any participants based on body weight.[120,168,169,171] Thus, the findings of two studies pertain only to women who began pregnancy with a BMI in the obese category, one is relevant to women with a pre-pregnancy BMI in the normal, overweight or obese groups, and the others potentially have greater external validity across a wider range of pre-pregnancy BMI classifications. In terms of ethnic backgrounds, the groups were ethnically narrow except for Herring et al, whom recruited socioeconomically disadvantaged African-American women.[161]

Approaches Used in the Interventions

All women within the intervention group interacted with some type of HCP, and included Registered Dietitians (RD) (2)[169,170], midwives (2)[95,172], public health nurses (1)[171] or health coaches (2)[120,168,173]. In the HIPP study, the health coaches were allied health professionals trained in the health coach approach[120,168] and in the Herring et al study, the health coach was a bachelor's level health coach that was trained in behavioural weight control techniques.[161] All studies involved lifestyle counselling of some manner, and two studies offered free exercise classes for intervention women[169,172]. Six of seven studies included some component of a face-to-face interaction, however, the intervention by Herring et al was only via phone.[161]

In Herring et al's pilot RCT, the control women attended routine care while the intervention group received health coach calls, individualized text messages, and access to a Facebook support group.[161] The intervention emphasized self-monitoring, skill and knowledge attainment and peer support through the different aspects of the intervention. The intervention did significantly decrease the proportion of women who exceeded the GWG guidelines.[161]

Claesson et al's intervention group included 348 obese women who attended weekly individual motivational talks with a midwife in addition to access to two aerobic classes per week.[172] The control group attended routine prenatal care. Significant GWG results were found;

however, with a mean of 22.1 visits in pregnancy, suggests it may be an impractical intervention with a great time burden on the HCP and the pregnant woman.[172] It is important to note that there was no randomization of women between the intervention and control groups, as they were taken from two different cities. Furthermore, the intervention group had higher socioeconomic status and a greater proportion of primiparous women.[172] With more positive findings in the INT group, it must be interpreted with caution. With a higher socioeconomic status and no other children to care for, a woman may have more time to dedicate to lifestyle behaviours such as attending fitness classes and cooking healthy food.

Bogaerts et al designed their intervention for obese pregnant women and compared three groups: a lifestyle intervention group, a brochure group receiving routine care plus a healthy lifestyle brochure, and a group receiving routine care only.[95] The lifestyle intervention group saw a midwife in pregnancy for small-group (3 women) sessions where the midwife used motivational interviewing (MI) techniques. The midwife explored barriers the women faced for a health behavioural change. The sessions provided reinforcement for lifestyle habits related to nutrition and physical activity, yet discussed personal worries about pregnancy if necessary.[95] The total GWG significantly differed between all 3 groups, with the brochure group gaining the least weight, followed by the lifestyle intervention group.[95] The study did not specify how the weight gain corresponded to the IOM guidelines. The drawback to this study is that they did not specify the demographic and baseline characteristics of the three groups and it is unknown if the 3 groups can be compared equally. This study was unique as it measured levels of anxiety in the women with the State and Trait Anxiety Inventory tool.[95] The levels of anxiety were significantly lower in the women who were apart of the small group session in which the midwife used MI techniques.[95] This suggests this MI approach could assist in improving mother's mental health.

The intervention study by Hui et al, in Winnipeg, Manitoba had women meet with a RD for dietary interviews twice during pregnancy.[169] Discussions were personalized based on the woman's dietary recall for the week. Within this dietary interview, women completed their dietary recall using Food Choice Map software.[169] The RD assisted the women when completing this dietary recall; by collaboratively completing this 7-day food recall, through discussion, the RD could better understand the reasons behind the woman's food choices.[169] This would allow the RD to provide a more personal and attainable dietary plan. For physical activity, the women

had access to a weekly group session with a trainer and were given instructions for home exercise. Activities done at home were logged and reported back to the study team via a written logbook. The control group did not meet with a RD and did not complete logbooks.[169] Among the normal weight women, the intervention group had approximately 20% lower total GWG compared to the control study group.[169] Total GWG was similar in overweight and obese women in both study groups.[169] Dietary intake was assessed by 3-day food records twice in pregnancy (at enrollment and 2 months following). Dietary patterns improved in the intervention group, regardless of pre-pregnancy BMI, yet quantity of physical activity was only significantly increased in the normal weight women.[169] The change in diet and physical activity in the normal weight women may have been main contributors to minimize excess GWG. The personalized feedback based on the participants' dietary recall and rate of weight gain, and weekly group exercise sessions provided check-in points for the intervention group. This did not occur with the control group. Discussions with the RD prompted planning for an achievable behaviour change goal.[169]

Phelan et al's Fit for Delivery study, used a step-wise care model.[170] Specifically, women had 1 face-to-face visit with a RD, received weekly newsletters, setting of lifestyle goals and regular telephone calls with the RD. If weight was not tracking appropriately, extra phone calls were made and structured meal plans and specific goals were given until weight tracking aligned with the IOM guidelines for weekly rate of weight gain.[170] The control group attended routine care, and a brief study entry visit that provided general pregnancy-related information not specific to healthy lifestyles. Data was obtained from both groups at the study entry visit, a 6-month postpartum visit and through review of the obstetric records.[147] The step-wise care model provides the intervention group non-equivalent care where all women did not receive the same quantity of care. In women with a normal pre-pregnancy BMI, positive GWG results were found.[170] Thus, this study suggests that within this group of women, a stepped approach to care for women who are falling outside of the GWG guidelines may be effective in helping them gain within the guidelines by the end of pregnancy. Tracking women's rate of weight gain early in pregnancy could be important to understand where to focus an increased frequency of lifestyle-related discussions. It is important to note that this study did not specify success rates of women based on quantity of intervention received. This would be of interest to know to understand the

extent of additional clinical resources (i.e. RDs or other related HCPs) needed to accommodate extra appointments and adapt to scheduling challenges.

Inclusion of Behaviour Change Theory

All interventions had the goal of impacting GWG through modification of lifestyle behaviours, and 5/7 designed their study using at least one BCT. Studies grounded their study in a variety of principles from the following theories: Stages of Change[95,120,168], Social Cognitive Theory[120,168], Social Ecological Model[161], Social Learning Theory[170] and the Theory of Planned Behaviour[120,168].

The Health in Pregnancy and Post Birth (HIPP) study design was grounded in aspects from aspects of multiple behaviour change theories.[120,168] The four theories included the social cognitive theory, readiness to change importance and confidence, transtheoretical model and the theory of planned behaviour.[120,168] Hill & Skouteris et al used a health coaching model that blended motivational interviewing, solution-focused coaching and cognitive behavioural therapy.[120,168] The health coaches used an empowerment approach to help participants make their own health goals for the purpose of weight management.[120,168] Empowering an individual to choose their own goal makes them more likely to make a change.[153,154] The control group received education (i.e. what to eat), but had no encouragement or focused support from a health coach to apply recommendations to their own life.[120,168] At the end of the study, there was no difference in total GWG or guideline adherence between study groups.[120,168] Women who received health coaching had both higher readiness and more knowledge to make lifestyle changes. They also saw greater importance in gaining appropriate GWG.[168] Postpartum, positive coping skills (assessed with the COPE measure) were greater in the women who received health coaching.[120] The authors suggest that positive coping skills could make a difference in the women's lives since it could help to mitigate the negative effects of stress and transition, and has been noted as an indicator of one's well-being.[120] Improved ability to positively cope through the changes experienced in pregnancy, childbirth, and postpartum, may lead to a more positive well-being.[120] Interestingly, self-efficacy to gain GWG within the guidelines was not increased among women in the study.[168] Self-efficacy could be a key modifiable factor in preventing excess GWG, and needs to be measured in future intervention studies to better understand its role.[168] A limitation of the HIPP study is that intervention group women tracked weight in a weight gain

passport at each visit.[120,168] The extent to which regular monitoring may have contributed to health coaching is unclear.[120,168] Emerging research found consistent use of an internet based self-monitoring gestational weight gain tool to be associated with a reduced risk of excessive GWG in high income women with a normal pre-pregnancy BMI.[174] Self-monitoring is an important factor that assists in promoting behaviour change[175,176] and may help to limit excess GWG[177,178].

Patient Guided Aspects

Three of the seven studies had predetermined goals for participants to follow.[35,161,171] In these studies, the visit topic was guided by pre-determined nutrition topics set out in advance. Kinnunen et al individualized the goals by choosing a subset from the pre-set goals that may be most helpful for the women based on her current dietary intake.[171] Study chosen goals have drawbacks as the goals may not be feasible, acceptable, nor necessary for the women based on her current habits and her life context. Little is known about the sustainability of these pre-set lifestyle changes beyond pregnancy.

To improve maternal health, women need to make personal, relevant, practical, and sustainable health goals that can be maintained lifelong.[153,154] In the HIPP study, the goal was entirely self-chosen by the participant.[120,168] The HIPP study team pointed out an important consideration about their person-centered model. By allowing women to choose individual goals, the goals may not be directly contribute to weight changes, a primary outcome of the study.[120] In their study, only 8% of women chose a goal to achieve a healthy GWG. The remaining goals were related physical activity (49.6%), energy levels (15%), nutrition management (17.7%) and psychological related factors (9.8%).[120] Although these other goals may not directly contribute to weight management, improvements in many lifestyle behaviours should be encouraged and supported. At the end of the study, the health coaching did not directly impact GWG; however, there were improvements in coping skills, increased readiness and knowledge about healthy lifestyle changes, and heightened awareness of the importance of healthy GWG.[120,168] These are important aspects that contribute to behaviours that lead towards healthy GWG.[120,168] However, as they do not relate to the primary outcome of the study, this could dilute the apparent effects of the intervention.

If sustained, changes in long-term lifestyle habits may positively affect weight status, BMI, disease risk or health outcomes. Additionally, by involving individuals decisions about what changes are most salient for them to change, there is a greater likelihood they will make the change.[153,154] More research is needed to understand the magnitude of the impact of person-centered care on health outcomes and patient satisfaction.[179] Our study results will help contribute to the current gap in GWG interventions that allow client-centered goal setting.

Methods Utilized to Assess Improved Lifestyles

Due to our inclusion criteria, all studies measured total GWG. However, it is interesting that although the interventions were designed to ultimately minimize GWG through changing dietary intake and physical activity, only 3/7 studies assessed lifestyle behaviours such as diet or physical activity.[169,35,170,171] Two of the three studies assessing dietary intake found positive changes in these behaviours. [169,35,170,171] Hui et al measured dietary intake through 2, 3 day food records (once at study initiation < 26 weeks and another 2 months later). Based on the intervention earlier described, Hui et al found the intervention women significantly improved their lifestyle habits through decreased calorie, cholesterol and total fat intake, while normal weight women significantly decreased their carbohydrate intake and increased their physical activity intake compared to control group women.[169] Kinnunen et al's intervention (described earlier) involved counselling from a public health nurse on pre-set topics. Dietary intake was assessed through a food frequency questionnaire at 8-9 weeks gestation, and compared to intake at weeks 36-37. After adjusting for confounders, their intervention group increased their vegetable, fruit and fiber intake.[171] Lastly, the HIPP study asked one question about the number of servings of fruit a women eats per day, and another about the number of servings of vegetables eaten each day. This was a proxy for diet quality, however, no difference was found between the groups.[120]

Overall

There is a need to better understand the multitude of factors that influence weight gain in pregnancy. In the research realm, there is a need for a more consistent approach to interventions. Lifestyle behaviour improvements, independent of weight outcome improvements should be deemed as success as these healthy behaviours may be important pre-cursors to healthy GWG.

Additional factors that impact a woman's GWG and need to be further investigated include biological factors of pregnancy, psychological factors, sociocultural factors, self-efficacy, and the role of the network of social support surrounding the pregnant woman.[99]

2.10 Healthy Conversation Skills

After reviewing the relevant literature to understand the needs of pregnant women and prenatal HCPs, we investigated the use of a communication technique called Healthy Conversation Skills (HCS). This technique has been previously trialed by a team of collaborators from the University of Southampton.[49,50,127,180] HCS is one communication technique that could help HCPs initiate client-centred care with a woman. A similar communication client-centered technique is motivational interviewing.[181] Although it is also grounded in behaviour theory, motivational interviewing can be a complex skill for a HCP to learn and master.[182] The skills utilized within HCS are simple to learn, and can be utilized by front-line workers, regardless of previous education.[49] Additionally, HCS can be used within a short time, such as a brief interaction with a HCP, whereas motivational interviewing often requires formation of a therapeutic relationship.[181,182] HCS holds promise as a practical means to implement into the training of HCPs for incorporation into existing prenatal care models.[49] Due to its practicality, use of HCS was trialed in this study.

HCS is a supportive conversation technique that is grounded in empowerment and shared decision-making.[49,180] HCS was developed by a multi-disciplinary public health team from the Medical Research Council: Lifecourse Epidemiology Unit (MRC: LEU) at the University of Southampton, in collaboration with community partners.[49,180] This practical approach has been adapted to suit a wide range of health and social care professionals across a variety of clinical and community settings. At its core, this approach uses active listening and open-ended questions to enable an individual to reflect on their lifestyle behaviors and engage in their healthcare.[49] The three key skills the HCPs are trained within HCS are: asking Open Discovery Questions (typically questions beginning with the words "What" or "How"), active listening, and supporting the client in the process of setting and evaluating SMARTER (Specific, Measurable, Attainable, Realistic, Timely, Evaluate, Review) goals. Open discovery questions from the HCP are used to prompt women to reflect on their behaviour, identify and resolve barriers to performing a given behaviour, and guide an individual through the process of creating the step-

wise actions needed to produce behaviour change.[49] Literature suggests that it is beneficial to health if women feel in control of their lifestyle behaviours[183], and the empowerment model provided by HCS aims to give women this opportunity. Less emphasis is placed on the education and counselling role that HCPs often have, and more on supporting the individual to make healthy behavior changes that will suit their own context.[49,180]

Positive outcomes have been observed by staff trained in HCS. In one study, play, family support, community development workers, dental health workers, community health nurses and administrative staff that worked a centre providing health and education for vulnerable women and young families were trained in HCS.[49,127] Compared to a similar group of who had not been trained, the HCS-trained workers had a significant increase in median confidence rating for use of open discovery questions and increased confidence for discussing healthy eating and exercise with women compared to staff not trained in HCS.[127] Compared to untrained peers, the HCS trained staff exemplified higher competence for skills within HCS several weeks after training, and 1 year later, the trained staff were using a significantly higher number of the skills.[49] Thus, HCS appears to hold promise as an approach to change staff behaviours related to health counselling. Patient outcomes have yet to be studied but are critical to understand.

HCS-trained staff report that lack of time with women continued to be a barrier to effective counselling sessions.[50] However, there were differing viewpoints on this. Some staff stated they had time constraints and that providing women with solutions would be faster than asking questions. Conversely, other staff actively sought and found opportunities to start HCS throughout their visit. The authors suggested these differing opinions might be due to differences in the staff member's confidence and competence using HCS.[50] HCS is a communication technique that could be embedded into a HCPs current practice and ideally increases the HCPs awareness to opportunities that arise to supports individuals towards healthy behaviour change.[49] Opportunities can be capitalized upon by starting with use of open discovery questions and active listening.

2.11 Rationale for the Intervention

In 2014, an environmental scan of the GWG intervention literature was completed prior to designing the study to incorporate best promising practices to support women to achieve optimal health in pregnancy (Adam et al, unpublished). Four promising practices from this environmental

scan were incorporated into the study design. The four promising practices addressed were (1) continuity of care, (2) provision of support in a practical and motivational manner, (3) provision of care in an individualized manner, and (4) setting goals collaboratively.

To address continuity of care, each group within our study had their own RD as this has been previously found to increase rapport and trust between HCP and the woman. Additionally, continuity of care has been found to result in delivery of consistent messages and to foster an increase sense of responsibility to comply with goals previously set.[184,185] Follow-up throughout pregnancy can help women feel more confident in making a change and feel as if they have a trusted resource to access if needed. In our study, the communication technique, HCS, was utilized by the intervention study RD to address the promising practice of providing support in a practical and individualized manner. Opportunities for personalized lifestyle discussions arose while completing the lifestyle questionnaires. The intervention RD used women's answers to questions as an opportunity to initiate discussions about health, weight, nutrition/healthy eating and other related behaviours with women using HCS. By listening to woman's experiences, the intervention RD could work alongside the woman with the aim of increasing her feelings of support and confidence in finding healthy behavior changes that will work within her life. These conversations were reinforced at each in-person visit and during each follow-up phone call. If goals were previously set, follow-up occurred at subsequent interactions. In previous research, it has been found that personalized feedback and supportive follow-up phone calls was of value.[170,186] To address the last promising practice, collaboratively setting realistic goals ensures mutual accountability between HCP and woman.[187] In this study, SMARTER goals were ideally made at each interaction and follow-up occurred at future visits and/or telephone calls. However, the creation of new SMARTER goals was guided by a participants' readiness and willingness to make a change. The study logic model is provided within the Appendix. (p126, Appendix)

When more aspects of behaviour change theory are involved, the effect of an intervention is increased; thus, in addition to integration of promising practices, important behaviour change techniques were also included.[188] These techniques are identified in Table 2.2.

Use of HCS within this study utilizes a comprehensive, patient-centered approach that engages patients in shared decision-making that explores topics the patient wants to discuss. With the many changes in pregnancy that are unique to each woman, this conversation model holds promise. Ultimately, this thesis is novel for 3 reasons as it is the first study: (1) to assess

participant outcomes and perspectives in regards to HCS, (2) in Canada to use HCS and (3) to compare the effectiveness of the HCS approach led by a RD, in comparison to a RD not using HCS.

Table 2.2: Behavioural Change Components Incorporated in the Study for the Intervention group

Technique	Behaviour Change Theory	Objective	Use in this Study
Promote Self-efficacy	Social Cognitive Theory	To increase each participant's ability to make healthy behaviour changes. Allow them to feel motivated and in control of their behaviours in pregnancy.	Use of HCS will help the participant understand what changes they can make towards a healthier lifestyle. Together, steps toward the goal can be discussed.
Barrier Identification	Social Cognitive Theory	To have the participant consider barriers that could arise when making a change. Discuss solutions to overcome them.	Use of open discovery questions in HCS will allow the participant to reflect on potential barriers.
Goal Setting & Review of Goals	Control Theory	To provide the participant the ability to make planned decision about a behaviour change. Specifying a goal allows the RD to follow-up at future interactions.	For those willing to make a healthy behaviour change, SMARTER goals will be developed. Goals will be reviewed through phone calls and visits. Reinforcement of healthy behaviours and barrier resolution will be discussed with the RD.
Positive Reinforcement	Social Cognitive Theory	To provide encouragement when behaviours align with their SMARTER goals.	The INT RD will follow-up at phone calls and visits to understand progress towards goals. Encouragement for positive behaviours that contribute to will be reinforced.
Social Support	Social Support Theories	To provide the participants with the understanding that the RD is available for ongoing support.	The study RD will provide support and reassurance to the women throughout pregnancy.

(modeled after Smith et al, 2010; Abraham and Michie 2008

2.12 Summary

Excess GWG has become prevalent in most developed countries worldwide. Due to the potential for excess GWG to negatively impact the mother and her offspring, it is important that promotion of healthy GWG is made a priority.[5,9-16] The IOM and Health Canada provide some guidance about how often HCP should discuss healthy weight gain in pregnancy, but there has been limited evidence to indicate what the best ways are to undertake these discussions and what other supports are needed to improve rates of guideline concordant GWG. Although several interventions have been trialed thus far, differences in the approaches to the intervention design

and participant characteristics along with lack of detail about participant responses and adherence to interventions makes it difficult to compare between interventions and to identify best practices in this area. Interventions grounded in behavior change aspects will make important contributions to understanding best practices in this area.

There is a need to better assess the multitude of factors that influence a women's health, and resulting weight gain in pregnancy. Changes to eating and physical activity behaviours, independent of weight outcome improvements are likely important precursors to healthy GWG. Additional factors that need to be further investigated include biological factors, psychological factors, sociocultural factors and the role of the network of social support for the woman.

A novel communication technique, Healthy Conversation Skills, has the potential to be used by HCPs to undertake supportive, client-centered conversations that are aimed to support pregnant women in making healthy behaviour changes during pregnancy. This conversation technique has a potential to improve the communication and understanding between HCP and woman. Acceptability of HCS has yet to be assessed from the perspective of a participant/client. Future research is needed to understand if HCS could directly embedded into prenatal care as a method to support women to have healthy lifestyles in pregnancy. Prenatal care provides a great opportunity for HCPs to interact, encourage, and positively support all women. HCS holds promise as a practical solution to implement into pre-existing prenatal care models. With improved prenatal care, the health of pregnant women and their offspring could be improved. Over the long-term, such efforts could help to improve health across generations.

Chapter 3: Can Facebook Be Used for Research? Experiences Using Facebook to Recruit Pregnant Women for a Randomized Controlled Trial

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3.1 Abstract

Background: Recruitment is often a difficult and costly part of any human research study. Social media and other emerging means of mass communication hold promise as means to complement traditional strategies used for recruiting participants because they can reach a large number of people in a short amount of time. With the ability to target a specified audience, paid Facebook advertisements have potential to reach future research participants of a specific demographic. This paper describes the experiences of a randomized controlled trial in Edmonton, Alberta, attempting to recruit healthy pregnant women between 8 and 20 weeks' gestation for participation in a prenatal study. Various traditional recruitment approaches, in addition to paid Facebook advertisements were trialed.

Objective: To evaluate the effectiveness of paid advertisements on Facebook as a platform for recruiting pregnant women to a randomized controlled trial in comparison with traditional recruitment approaches.

Methods: Recruitment using traditional approaches occurred for 7 months, whereas Facebook advertisements ran for a total of 26 days. Interested women were prompted to contact the study staff for a screening call to determine study eligibility. Costs associated with each recruitment approach were recorded and used to calculate the cost to recruit eligible participants. Performance of Facebook advertisements was monitored using Facebook Ads Manager.

Results: Of the 115 women included, 39.1% (n=45) of the women who contacted study staff heard about the study through Facebook, whereas 60.9% (n=70) of them heard about it through traditional recruitment approaches. During the 215 days (~7 months) that the traditional approaches were used, the average rate of interest was 0.3 (SD 0.2) women/day, whereas the 26 days of Facebook advertisements resulted in an average rate of interest of 2.8 (SD 1.7) women/day. Facebook advertisements cost $506.91(CAD) with a cost per eligible participant of $20.28 (CAD). In comparison, the traditional approaches cost $1087 (CAD), with approximately $24.15 (CAD) per eligible participant. Demographic characteristics of women were similar between the 2 recruitment methods except that women recruited using Facebook were significantly earlier in their pregnancy than those recruited using traditional approaches (P<.03).

Conclusions: Paid Facebook advertisements hold promise as a platform for reaching pregnant women. The relative ease of placing an advertisement, the comparable cost per participant recruited, and the dramatically improved recruitment rates in comparison with traditional approaches highlight the importance of combining novel and traditional recruitment approaches to recruit women for pregnancy-related studies.

Trial Registration: ClinicalTrials.gov NCT02711644; https://clinicaltrials.gov/ct2/show/NCT02711644 (Archived by WebCite at http://www.webcitation.org/6kKpagpMk)

Keywords: pregnant women; maternal health; social media; internet

3.2 Introduction

The recruitment portion of human research studies is often expensive and resource intensive. Finding interested and eligible participants can be challenging and can take longer than expected. Extending the recruitment period can negatively affect time-sensitive study funding, delay data collection and analyses, and ultimately delay the release of evidence necessary to change practice. For prenatal studies, an additional challenge is to find women at an appropriate gestational age.

Traditional recruitment approaches for prenatal studies include printed posters and brochures, radio, television, and newspaper advertisements, word of mouth, and approaching pregnant women in clinics (1)[189]. Placing materials and/or study staff within family physician offices, public health centers, and community centers requires the investigators to establish working relationships with other individuals or agencies, which also takes time. Several investigators have highlighted the potential of supplementing traditional recruitment approaches with social media–based approaches to improve effectiveness of recruitment for clinical studies involving pregnant women (2,3)[190,191]. Social media, including Facebook, is more than a way to connect with friends and has evolved into a platform for sharing information (3)[191] as well as an effective location for crowdfunding for various causes (4)[192]. With an average of 1.09 billion users daily (5)[193], Facebook is the social media site that individuals engage in most often (6)[194]. The greatest proportion of users are women between the ages of 18 and 49 years (6)[194], which highlights its potential to recruit participants for prenatal studies. Women are likely to engage on Facebook by "sharing statuses" and "liking" posts, which may allow information to be quickly passed along to Facebook friends (4,7)[192,195].

Edmonton, Alberta, has been noted previously to be a difficult center in which to access and recruit pregnant women for research (1)[189], and Facebook advertisements have proved useful for other studies recruiting participants from "hard to reach" populations. For example, parents of 13- to 17-year-olds (8)[196], immigrants with language barriers (9)[197], individuals at high risk for human immunodeficiency virus infection (10)[198], adolescents (11,12)[199,200], and young adult veterans (13)[201] have all been successfully recruited using this approach. Advertising to potential participants via Facebook is novel within maternal health research. One study found social media effective for recruiting women before conception (3)[191], while 3 other studies used paid Facebook advertisements to successfully recruit participants for preconception (14)[202] or prenatal

studies (15,16)[203,204]. Each of these pregnancy-related studies involved Internet-based or telephone interventions; thus, there is little known about the potential for Facebook to be used to recruit pregnant women to a randomized controlled trial (RCT) involving face-to-face clinic visits.

The overall objective of the RCT was to examine the efficacy of supportive prenatal counseling versus standard prenatal care in promoting appropriate weight gain and dietary intake among pregnant women. The recruitment goal was 70 healthy pregnant women between 8 and 24 weeks' gestation, living in the greater Edmonton area. The purpose of this paper was to evaluate the effectiveness of paid advertisements on Facebook as a platform for recruiting pregnant women to this RCT in comparison with traditional recruitment approaches.

3.3 Methods

3.3.1 Recruitment

Recruitment for the RCT using traditional approaches, including printed posters and brochures, word of mouth, newspaper advertisements, local television news health report, booths at mommy/baby fairs, and advertisements in physicians' offices, started in July 2015. A Facebook account was created to distribute paid advertisements that ran intermittently from October 6 to December 1, 2015, for 26 nonconsecutive days. Advertisements were targeted to Facebook users based on the following criteria: female, 23-40 years of age, living in the Edmonton + 25-mile radius geographic area, and "Interests" related to pregnancy. The "Interests" used were Childbirth, Infant, Maternity clothing, Mommy connections, Parent, Prenatal, Prenatal care, Prenatal development, Motherhood, Today's Parent, Ultrasound, Prenatal nutrition, Family, and Parenting (Figure 3.1). Advertisements were managed with a set lifetime budget and Facebook performed the automatic bidding. Advertisements were optimized to get the most number of clicks to the study website at the lowest cost, with fees charged per impression. All Facebook advertisements used the same wording with the headline "Be healthy for baby and you!" and the description text: "Are you less than 20 weeks pregnant? Join a prenatal research study at the University of Alberta and have free access to a Registered Dietitian!"; multiple photographs were tested (Figure 3.2). Interested women were prompted to click on the "Learn More" button, which took them to the study website (17)[205] where details

about the study were provided, including the study contact information. Potential participants were encouraged to contact study staff, after which an appointment was set for screening to determine participant eligibility. Informed consent was provided by the participant in writing before the start of data collection at the baseline visit.

Performance of Facebook advertisements was monitored regularly and optimized in real time using Facebook Ads Manager. Following the trial of multiple paid Facebook advertisement campaigns, the advertisement performance was assessed by examining number of clicks and the amount of engagement. Engagement can be defined as interactions with the study advertisement such as likes, comments, or shares. Funds were reallocated to the Facebook advertisements with the highest number of clicks and highest rate of engagement. Advertisement performance was most affected by the location of the advertisement and the "Interests" specified. Advertisements located on the mobile newsfeed performed better than those on desktop newsfeed; therefore, desktop advertisements were turned off after 9 days. The "Interests" *Prenatal nutrition*, *Family*, and *Parenting* were removed after 9 days owing to poor performance determined through analytics produced from a free trial of AdEspresso, a platform that provides additional statistics to optimize paid Facebook advertisements (18)[206].

Costs associated with each recruitment approach were recorded and used to calculate the cost to the study to recruit eligible participants. The time required by staff to support each of these approaches was not captured and therefore not included in the cost calculations. The local television news report (ie, news reporter, film crew, television airing of segment) was donated in kind, and therefore the costs associated with it were also not included in determination of costs.

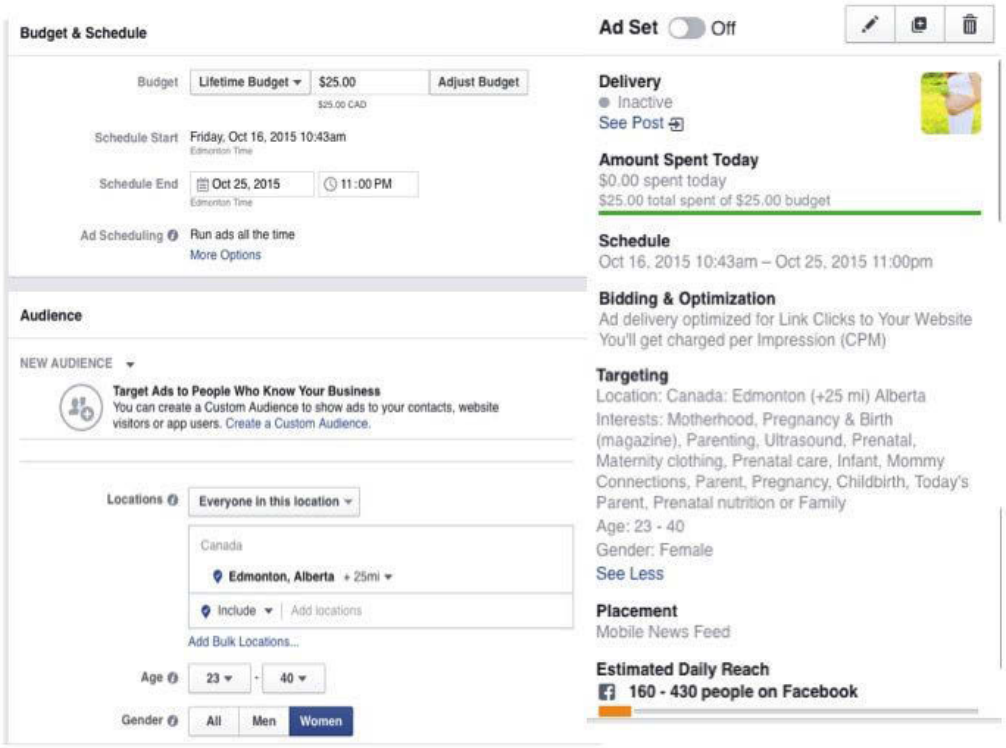

Figure 3.1 A screenshot that shows the set-up of a paid Facebook advertisement.

3.3.2 Statistical Analysis

Advertising performance statistics were collected from information provided by Facebook Ads Manager. Demographic information was self-reported by participants who were eligible and had consented to study participation. These data were collected through the Research Electronic Data Capture (REDCap) Consortium member site housed at the University of Alberta (19)[207]. We used *t*-tests or Pearson chi-square tests, as appropriate, to investigate differences between groups recruited on Facebook and through traditional means. A *P* value of .05 was considered statistically significant, and all data were analyzed using Stata 14.1 (StataCorp. 2015. Stata Statistical Software: Release 14. College Station, TX, USA: StataCopr LP).

Ethics approval for the RCT was obtained from the Health Research Ethics Board–Health Panel at the University of Alberta (study ID number: Pro00054360). This study is registered at ClinicalTrials.gov (ID: NCT02711644).

Figure 3.2 A screenshot that shows the paid Facebook advertisements on a mobile phone.

3.4 Results

3.4.1 Recruitment

A total of 11 women (11/126, 8.7%) did not indicate how they heard about the RCT and were excluded from further analyses. Of the 115 women included in analysis, 39.1% (n=45) of the women who contacted study staff heard about the study through Facebook, whereas 60.9% (n=70) of them heard about it through traditional approaches (Figure 3.3). Paid Facebook advertisements were received by 44,439 people on their Facebook newsfeed and 1001 Facebook users advanced to the study website, resulting in a click-through rate of 2.3% to the study website. Because of the nature of traditional approaches, the reach of recruitment efforts is not known.

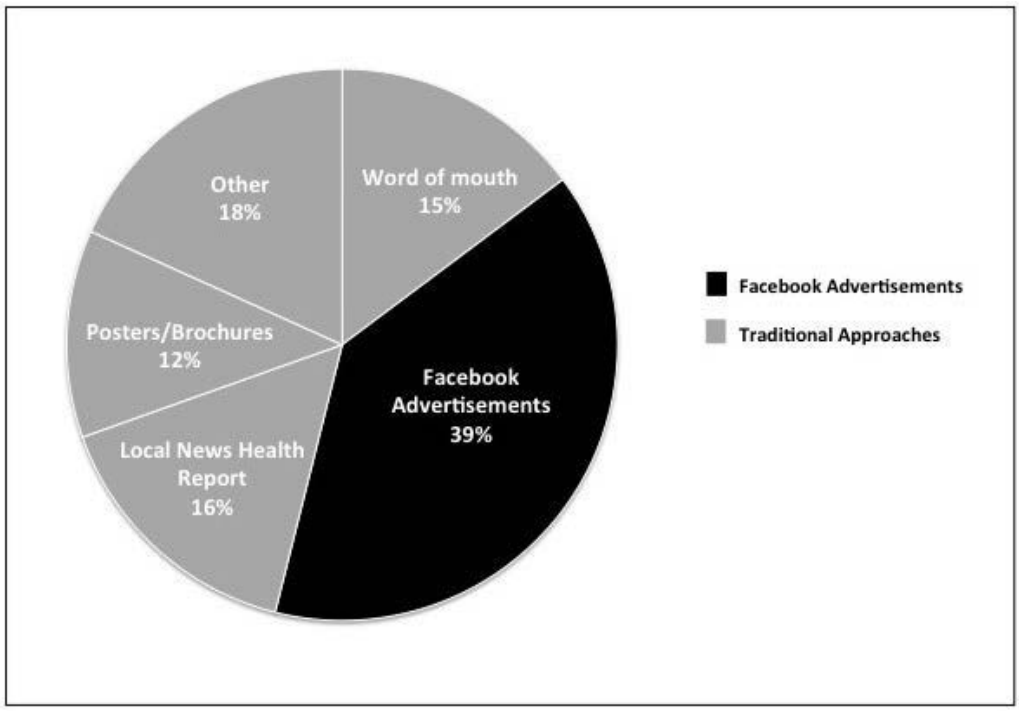

Figure 3.3: Proportion of interested women for the randomized control trial using Traditional approaches and paid Facebook Advertisements (n=115). The Traditional Approaches include methods listed in addition to 'Other' methods that consist of: Online classified advertisements, Doctor referrals, blog posts, email newsletters, newspaper advertisements, mommy markets and online mom connection groups.

During the 215 days (~7 months) that the traditional approaches were used, the average rate of interest was 0.3 (SD 0.2) women/day. The local television news report resulted in 18 women contacting the study and was the most successful component of the traditional approach. When the local television news report is excluded, the remaining traditional approaches had an average interest rate of 0.2 (SD 0.1) women/day. In comparison, the 26 days of Facebook advertisements resulted in an average interest rate of 2.8 (SD 1.7) women/day. The traditional approaches alone (i.e., before launching Facebook advertisements) had an overall interest rate of 8.7 women/month. Adding Facebook advertisements to traditional recruitment approaches increased the overall interest rate to 29.7 women/month. Of note, the Facebook advertisements ran for 26 non-consecutive days to avoid advertisement fatigue. The maximum number of consecutive days the advertisement was displayed was 8. Advertisements were stopped on day 8 as the performance statistics dropped on days 6-8.

The 45 women who contacted study staff in response to the Facebook advertisement resulted in 40 women who were screened and 25 who were eligible and agreed to participate in the study (55.6% of interested). This resulted in a recruitment rate of 0.96 eligible participants/day. Of the 70 women who expressed interest through traditional approaches, 64 were screened and 45 were eligible and agreed to participate (64.2% of interested), resulting in a recruitment rate of 0.21 eligible participants/day. The calculated (hypothetical) amount of time needed to recruit 70 women using only traditional approaches is 334 days and could be shortened to 73 days using Facebook advertisements.

Facebook advertisements cost $506.91 (CAD), with a cost of $0.28 (CAD) per click. Other forms of engagement with the Facebook advertisements included 55 likes, 24 comments, and 28 shares. Most of the comments consisted of the names of Facebook friends who would be notified of the tag. A few comments required response from the study team as they asked questions regarding the eligibility criteria. Facebook advertisements had a cost per eligible participant of $20.28 (CAD). In comparison, the traditional approaches cost $1087 (CAD) for all methods combined (ie, printing, media advertisements, mileage to deliver brochures to different venues, participation at mommy/baby markets). Traditional approaches cost approximately $24.15 (CAD) per eligible participant.

3.4.2 Participant Characteristics Relative to Their Method of Recruitment

Women recruited to the RCT using Facebook were significantly earlier in pregnancy than those recruited using traditional approaches ($P<.03$) but were similar with respect to other demographic characteristics (Table 3.1).

Table 3.1: Characteristics of women recruited by Facebook advertisements vs. Traditional approaches

	Source of Recruitment				
	Facebook Advertisements (n=25)		**Traditional Approaches (n=45)**		
	Mean	**SD**	**Mean**	**SD**	**p-value**
Age (years)	35	4.6	34	4.5	0.42
Gestational Age (weeks)	12.6	3.7	14.7	3.8	0.03
Pre-Pregnancy BMI[a] (kg/m^2)	26.4	5.9	24.8	4.9	0.25
	n	**%**	**n**	**%**	**p-value**
Birthplace: Born in Canada	22	88	36	80	0.4
Not born in Canada	3	12	9	20	
Marital Status: Single	1	4	2	4	0.92
Married and/or Common-Law	24	96	43	96	
Education: Less than Bachelor Degree	6	24	17	38	0.24
Bachelor Degree or greater	19	76	28	62	
Household Income: < $70,000	2	8	8	18	0.26
> $70,000	23	92	37	82	
Employment Hours: Part Time	6	24	11	24	0.97
Full Time	19	76	34	76	
Parity: One	7	28	18	40	0.17
Two or more	3	12	2	4	

[a]BMI: body mass index.

3.5 Discussion

3.5.1 Principal Findings

This study highlights the improved time efficiency achieved by coupling Facebook advertisements with traditional approaches for recruitment of pregnant women to a research study. After a 3-month period of traditional recruitment, we decided to test Facebook recruiting. Along with traditional recruiting, we used Facebook for 26 non-consecutive days. Had we relied solely on traditional methods of finding interested women, it would have taken close to 1 year to reach our recruitment target, and this was shortened to less than 6 months by adding Facebook advertisements as a recruitment method. This improvement in recruitment rates of pregnant women is similar to that reported by a study recruiting women before conception. Shere et al

found that social media–based recruitment resulted in a 12-fold higher rate of recruits per month (3)[191]. It was suggested that the improved recruitment rates could reflect the fact that these types of social media are "active" because the platforms find women based on their previous Web searches related to the research topic, whereas traditional recruitment approaches may be considered "passive" because women likely come across the research opportunity by chance (3)[191]. Our study adds to the evidence indicating that social media holds promise for informing this population about research and recruiting them to participate. Mass media as a whole shows value in recruiting for prenatal research studies, as more than half (54.8%; 63/115) of the women who expressed interest in the study became aware through Facebook advertisements or the local news station health report. Ultimately, social media and other emerging means of mass communication hold promise as means to complement traditional strategies used for recruiting participants because they can reach a large number of people in a short amount of time.

On the surface, the absolute costs of the 2 recruitment methods used in this study were comparable ($24.15/eligible participant for traditional approaches and $20.28/eligible participant for Facebook advertisements (CAD)). Neither of these costs included those incurred by study staff. Staff or trainee time, mileage, and other related costs can be difficult to measure. The time required to generate and post Facebook advertisements is typically less than that needed to pick up and distribute posters and brochures to multiple sites throughout a large city. One of our traditional approaches, the television health report, was donated "in kind" and involved a local news anchor along with a 1-person film crew. This would have been very costly had the study not been seen as a valuable news item. The free television health report is considered a traditional approach to recruitment. However, if its contribution to the traditional recruitment rate is removed, the cost per eligible participant for traditional approaches increases to $33.97 (CAD). Future studies should track resource investments, such as staff time, more thoroughly to better understand the relative savings or costs of social media compared with traditional recruitment approaches.

To our knowledge, no additional studies have been published within the last 2 years examining paid Facebook advertisements as a recruitment tool for prenatal studies. Changes in reach, access, and usage of Facebook over the 5 years that these studies and our study span make it difficult to fairly compare results between studies. Our Facebook click-through ratio was better than the 0.08% reported in the study by Arcia (15)[203] but less than the 5.3% on the most

successful newsfeed advertisement reported by Harris et al (14)[202]. Arcia was recruiting nulliparous women at less than 20 weeks' gestation for a Web-based survey (15)[203], whereas Harris et al aimed to recruit young women for completion of a questionnaire on contraception methods (14)[202]. However, because both of these studies recruited between 2011 and 2013, the 2- to 5-year difference makes it difficult to compare them with our study in a fair way. It is possible that changes in the number or characteristics of people who regularly use Facebook along with changes in the features that Facebook provides to paid advertisers could contribute to the observed differences in click-through ratios. Social media certainly has excellent potential to aid recruitment efforts, although the magnitude of change over time remains difficult to quantify.

Our cost per advertisement click was slightly less than those reported by others. In several other studies, cost/click ranged from $0.39/click (20)[208] to $0.45/click (12)[200] and $0.63/click (15)[203] (CAD). Differences in the cost per click may vary for different demographic groups. Unique aspects of the target population need to be considered when formulating Facebook advertisements and when choosing topics of interest that help to identify and target these advertisements. Cost per click may continue to vary as Facebook and other social media platforms are modified, potential participants gain experience with using these platforms, or the platforms gain or lose active users. Relative to Facebook and other platforms that promote information sharing, one advertisement may reach more people than originally targeted (21)[209] through features such as a "like, share, or comment." This can positively result in a more extensive social network of people being notified of a study than what was originally selected (22)[201].

This study suggests that Facebook is a promising platform for reaching and recruiting pregnant women to a research study. Facebook advertisements can be more targeted than many of the traditional approaches because it is possible to define specific demographic and geographic characteristics, and information can be directed to those who search terms on the Web that align with the "Interests" specified by the researcher. Specifying "Interests" related to pregnancy likely enhanced the effectiveness of our advertisements because pregnancy is often a life event that is shared on social media platforms, and Facebook can display the advertisement to users based on their recent activity on the Web. Our RCT is the first prenatal study to describe the "Interests" used in their advertisements. This could be advantageous by reducing the time needed to identify interested participants for a research study. Because most women use the Web

to seek health-related information related to pregnancy, Facebook also holds potential as a useful way to distribute public health messages by using "Interests" to target this population (21,23)[165,209]. An important consideration for Facebook advertisements is striking the balance between advertisement specificity and reach (8)[196]. Targeting an audience with certain characteristics captured by Facebook could allow an advertisement to be cost-effective to reach the target population, but there is a possibility that some individuals will be missed. With approximately 27% of pregnancies being unplanned in Canada, it is probable that Facebook will miss these potential recruits (24)[210]. Individuals who do not use social media or do not have Web-based activity related to pregnancy would also fail to alert the algorithms and may be missed. Therefore, utilizing the combination of traditional recruitment approaches and social media–based approaches is ideal to avoid this selection bias (25)[211].

Previous studies have noted a concern that recruitment through Web-based methods may result in a non-representative population (26)[212]. We found that both approaches recruited women with similar demographic characteristics. Although not significant, a trend may exist of higher education and income within the Facebook group. Our study may not have been powered to detect difference in these populations. Two Australian studies also recruited a fairly nationally representative sample of females within the ages of 18-25 years using Facebook advertisements (11,14)[199,202]. In our study, the one difference between women recruited through Facebook and women recruited through traditional approaches was that those recruited through Facebook were at an earlier gestational age. This was a promising finding because it is often a challenge to recruit women early in pregnancy (27,28)[213,214]. Multiple investigators have noted the need for this in prenatal research (25,29-31)[164,165,211,215], and our findings suggest that Facebook advertisements could prove helpful in this regard. Similarly, Richardson et al (29)[215] found that their Internet-based advertisements recruited women significantly earlier in pregnancy compared with other methods.

3.5.2 Limitations

There are several limitations to this study. Our research team had little experience with Facebook advertisements before starting the study. The advertisements might have been more impactful or cost-effective if those formulating them had more experience developing, testing, and monitoring social media platforms and related statistics. Another limitation was that we could not determine whether women saw the advertisement on their personal Facebook page or if

it came to them through a friend who saw it on Facebook. In our study, "word of mouth" was labelled as a traditional approach, however the original study awareness may have originated from Facebook advertisements. This would underestimate the effectiveness of Facebook advertisements as a recruitment tool.

3.6 Conclusions

With ever-changing technology, researchers must stay current and utilize innovative approaches to find interested study participants. The ease of placing an advertisement on Facebook, the comparable cost per participant recruited, and the dramatically improved recruitment rates when Facebook advertisements were added to traditional approaches highlight the importance of combining novel and traditional recruitment techniques to efficiently recruit women to pregnancy-related research studies, even in geographic areas where recruitment is difficult (1)[189]. Future research should identify the best ways to target pregnant women using Facebook advertisements and other forms of social media to capture a broader range of the resources needed and costs associated with different approaches to recruiting these women.

3.7 Acknowledgments

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Chapter 4: The Effectiveness of Client-Centered Conversations to Promote Healthy Diets, Physical Activity and Guideline Concordant Gestational Weight Gain

4.1 Introduction

Gestational weight gain (GWG) in excess of the Institute of Medicine (IOM) guidelines is associated with adverse health outcomes for mother and child.[32] The IOM guidelines were adopted by Health Canada in 2010 and have been promoted to women and healthcare providers (HCPs) working with pregnant women since that time.[32,60] Still, many women exceed the guidelines since approximately 49% of women in the Alberta Pregnancy Outcomes and Nutrition longitudinal cohort gained in excess of these recommendations, and approximately 70% of women experienced excess GWG if they had a BMI in the overweight or obesity category prior to pregnancy.[17] Similar trends have been reported elsewhere in Canada[18,19], and in most developed countries worldwide.[18,21-26] As a result, there is a strong case to be made for identifying practical and effective approaches to promote optimal weight gain in pregnancy.

Many studies have examined different approaches to promoting appropriate GWG. These include dietary counselling[158,159], tailored text messages with feedback[160,161], mailed newsletters with diet self-monitoring, education on GWG guidelines and prescribed exercise[162], weight & physical activity books[163], video doctor support[164], pre-determined nutrition and/or physical activity goals[161,165,166] and provision of probiotic supplements coupled with dietary counselling[167]. Some have been successful[156], yet due to the intensity and frequency of the interaction, and other parts of the interventions, they are not suitable for adaptation into routine prenatal care in their present form. Since women in Canada have an average of 13 visits with a HCP during pregnancy, finding intervention strategies that can be adapted and implemented into existing prenatal care is preferable.[8]

Worldwide, of the 53 countries with a maternal weight gain policy (informal or formal), 43 (81%) of the policies encourage routine weighing at each visit.[216] In Canada, the Society for Obstetrics and Gynaecologists recommends HCPs weigh women at each visit.[138] It has been found that ~75% of HCPs in Canada weigh women regularly, however only half may relay this weight on to the woman.[33] A team in Australia demonstrated that routine weighing of women during prenatal care is not sufficient to promote guideline-concordant weight gain.[26] The IOM

recommends that HCPs review the gestational weight gain guidelines with every woman, and have an accompanying discussion about diet and exercise that is individualized to each woman's life context.[32] Although HCPs are aware of the importance of discussing weight and weight gain with women [37], research about HCP practices suggest that there are several barriers to incorporating these discussions into regular practice. Lack of time, lack of knowledge about specific lifestyle behaviours, lack of skills in methods leading to behaviour change, and lack of confidence to start and continue a conversation related to gestational weight gain and healthy lifestyles contribute to the gap between recommended and actual HCP practices.[37,39,40] Women voice the need for the conversation about weight gain and healthy lifestyles to be provided in a client-centered manner.[43] They desire to be heard, and want individualized care that is adapted to their life context and stage in pregnancy.[42-45]

To help HCPs overcome some of these barriers, and to improve the provision of client-centered care, a new communication technique called Healthy Conversation Skills (HCS) was trialed. HCS has been developed and successfully pilot tested in the United Kingdom.[49,50,127] It is a practical, patient-centred, communication approach designed for use by HCPs to help women identify and make health behaviour changes. Studies to date have examined the efficacy of front-line staff using HCS to discuss improved diet and physical activity behaviours with vulnerable women and families. Post-training, trained staff exemplify increased confidence in having conversations about healthy eating and physical activity, in addition to increased competence in using skills within HCS[49,127]. To date, the use of HCS not been examined relative to promoting healthy GWG.[49]

The HCS approach emphasizes using three key skills: asking Open Discovery Questions (typically questions beginning with the words "What" or "How"), active listening, and supporting clients to set a SMARTER (Specific, Measurable, Action-oriented, Realistic, Timed, Evaluated, Reviewed) goal.[49] The HCP's role is to support the individual to make healthy behavior changes that are tailored to their life context, and are feasible to sustain. Relatively less emphasis is placed on providing information to patients/clients, with a greater priority placed on initiating a lifestyle conversation. HCS is client-centered as client guide the topic and content discussed in each visit.[49,180]

The overall objective of the pragmatic RCT was to evaluate the efficacy of a Registered Dietitian (RD) using the HCS approach in assisting women in adopting and maintaining healthy

lifestyle behaviours and gaining weight in concordance with national GWG guidelines. The primary objective of this thesis was to compare the GWG of women in an intervention group (INT) whose RD used HCS, to women in an active control (AC) group whose RD did not use HCS. Additionally, a passive control (PC) group of women who had not seen a RD during their pregnancy was included in these analyses. A secondary objective was to compare differences in perceived dietary intake and physical activity behaviours, during pregnancy, for women in the INT and AC groups. The third objective was to compare the overall perceptions of the RD approach and satisfaction with participation in the study for women in the AC and INT groups.

4.2 Methods

4.2.1 Study Design

This study was a pragmatic randomized controlled trial (ClinicalTrials.gov ID: NCT02711644) in which 70 women between 8 and 20 weeks gestation were recruited from the Edmonton, AB area between July 2015 and January 2016. For recruitment, both traditional approaches and Facebook advertisements were used. The traditional approaches included printed posters and brochures, word of mouth, newspaper advertisements, local television news health report, booths at mommy markets, and advertisements in physicians' offices (p127-130, Appendix). The Facebook advertisements were targeted to recruit women of childbearing age. The paid advertisements ran for 26 non-consecutive days. Details of the Facebook recruitment process and its usefulness in recruiting a population that has been difficult to reach[189] are described in Chapter 3 and previously published as Adam et al[217]. Interested women were screened according to the inclusion criteria (Table 4.1) (p136-137, Appendix). After eligibility and participant interest was confirmed, all participants provided informed consent (p131-135, Appendix), according to the requirements of the Human Research Ethics Board-Health Panel at the University of Alberta (study ID number: Pro00054360). Operational approval for review of medical records was received from Alberta Health Services and Covenant Health. Administrative Approval for Research was also obtained from Alberta Health Services.

Table 4.1: Inclusion and Exclusion Criteria for the Study Recruitment	
Inclusion Criteria	**Exclusion Criteria**
- ≥ 8 weeks, ≤ 20 weeks gestation* - Singleton pregnancy - ≥ 20 years of age - Can read and speak English - Has Internet and telephone access - Can make the Baseline visit by ≤ 24 weeks gestation* - Willingness to provide self-reported pre-pregnancy weight and height - Willingness to provide Alberta Healthcare Number (PHN)* - Willingness to be randomized and blinded to group allocation.*	- Smoker - Incompetent cervix (previous or present diagnosis) - Complete/total placenta previa - Type I, Type II, Gestational Diabetes - Hypothyroidism or Hyperthyroidism - Present eating disorder - Pregnancy-Induced Hypertension (PIH) with adverse features (ie: edema) - Physical activity is contraindicated - Currently receiving care from a RD and/or a Midwife - Currently participating in another lifestyle program

Note: The * denotes criteria that did not apply to women recruited for the postpartum passive control (PC) group.

Participants were stratified by pre-pregnancy body mass index (BMI) and block randomized to either the intervention (INT) or active control (AC) group according to their pre-pregnancy BMI using conventional Health Canada cut-offs as follows: underweight (<18.5 kg/m^2) and normal weight (18.5-24.9 kg/m^2) or overweight (25.0-29.9 kg/m^2) and obese (≥30 kg/m^2) .[60] Pre-pregnancy BMI was calculated as follows: Pre-pregnancy BMI (kg/m^2) = (Pre-pregnancy weight in kilograms)/(Height in metres)^2. The randomized sequence of study ID numbers was generated by a statistician not involved in the study. Due to the pragmatic nature of this study, it was a single blinded study as participants were blinded to group assignment, however the study staff, (including the INT and AC RDs) were not blinded.

The Registered Dietitian (RD) working with the INT group had been trained in the HCS approach to counselling (training described in Figure 4.1) while the RD leading the AC group was an experienced RD but received no training in HCS. The AC RD was not aware of the intervention applied to the intervention group. The INT RD and AC RD had similar levels of professional dietetic experience. Additional details of the INT and AC groups are described below.

Figure 4.1: Description of "Healthy Conversation Skills" training
Communication is enhanced through practitioners developing the skill of asking open-ended, or open discovery, questions - those that generally begin with "how" and "what". Such healthy conversations allow a patient or client to explore an issue, identify barriers, and generate solutions that can be reviewed with the practitioner at their next encounter. Training aims to increase self-efficacy and sense of control of both practitioners and their patients and clients.

The three key skills are:

1. Using Open Discovery Questions (those that specifically support exploring of issues, barriers and priorities; problem-solving; and goal-setting).
2. listen rather than provide information.
3. supporting goal-setting through SMARTER (Specific, Measurable, Action-oriented, Realistic, Timed, Evaluated, Reviewed) goal planning.

Healthy Conversation Skills training typically consists of two 3-4 hour group sessions over one to two weeks to allow time for practising and reflecting on skills. Training is delivered by an HCS trainer experienced in group work and behaviour change, to a group of between 6 and 15 trainees. This should be followed by a period of on-going support, which may include a phone call or visit from one of the trainers to find out how skills are being implemented in practice. The phone call/visit allows trainees to reflect on the training, how they have implemented their new skills, any barriers to their implementation and plans for continued or increased use, including embedding self and peer reflection as part of normal practice. All follow-up activities are also opportunities to collect evaluation data to assess the effectiveness of the training. Undertaking these activities from one month post-training is based on an assumption that staff will have had opportunities to practice their new skills, and if they were finding this challenging, it would be a good time to reflect on this and make plans for progress. Further follow-ups can be undertaken at later stages to assess longer term use of the skills in practice.

All INT and AC participants followed the same study timeline and procedures (Figure 4.2). All study visits took place at the Human Nutrition Research Unit in the Li Ka Shing Centre for Health Research Innovation at the University of Alberta. The baseline visit occurred between 8 and 24 weeks gestation (booked close to the time of recruitment), lasted ~1.5 hours, and during it, women completed a demographic questionnaire (p138-140, Appendix), a lifestyle questionnaire (p141-171, Appendix) and an online 24-hour dietary recall[218] in collaboration with the RD assigned to their study group. All questionnaires were completed using a secure online data collection system, REDCap, hosted and supported by the Women and Children's Health Research Institute at the University of Alberta.[207] Twenty-four hour dietary intake data were collected and analyzed using the Automated Self-Administered 24-hour (ASA24®) Recall system (ASA24-CANADA-2014, National Cancer Institute, Bethesda, MD).[218] Height was measured to the nearest 0.1 cm using a stadiometer (Quick Medical 235 Heightronic Digital Stadiometer, Measurement Concepts, USA) and weight was measured to the nearest 0.1 kg (752KL Healthometer Professional Scale, Florida, USA). At approximately 26 weeks gestation, a link to a second dietary recall was sent to the participants via email. The INT and AC RDs

telephoned women in their respective group shortly thereafter to remind them to complete their dietary recalls and lifestyle questionnaires, and to book study visit 2. Study visit 2 occurred at ~30 weeks gestation and during that visit women completed a similar lifestyle questionnaire (p194-222, Appendix) with their respective RD as had been completed at baseline; current weight was measured as well. At approximately 34 weeks, a link to complete a third dietary recall and third lifestyle questionnaire (similar to the previous two) (p223-234, Appendix) was sent via email.

For the INT group only, the RD followed-up on any goals the participants had set during visits or telephone calls. A postpartum questionnaire was sent via email to each woman in the AC and INT groups at ~ 4 weeks after their due date (p243-254, Appendix). Women completed the postpartum questionnaire without the aid of the RD. Women were asked to record their highest weight in pregnancy, in addition to completing the questionnaire.

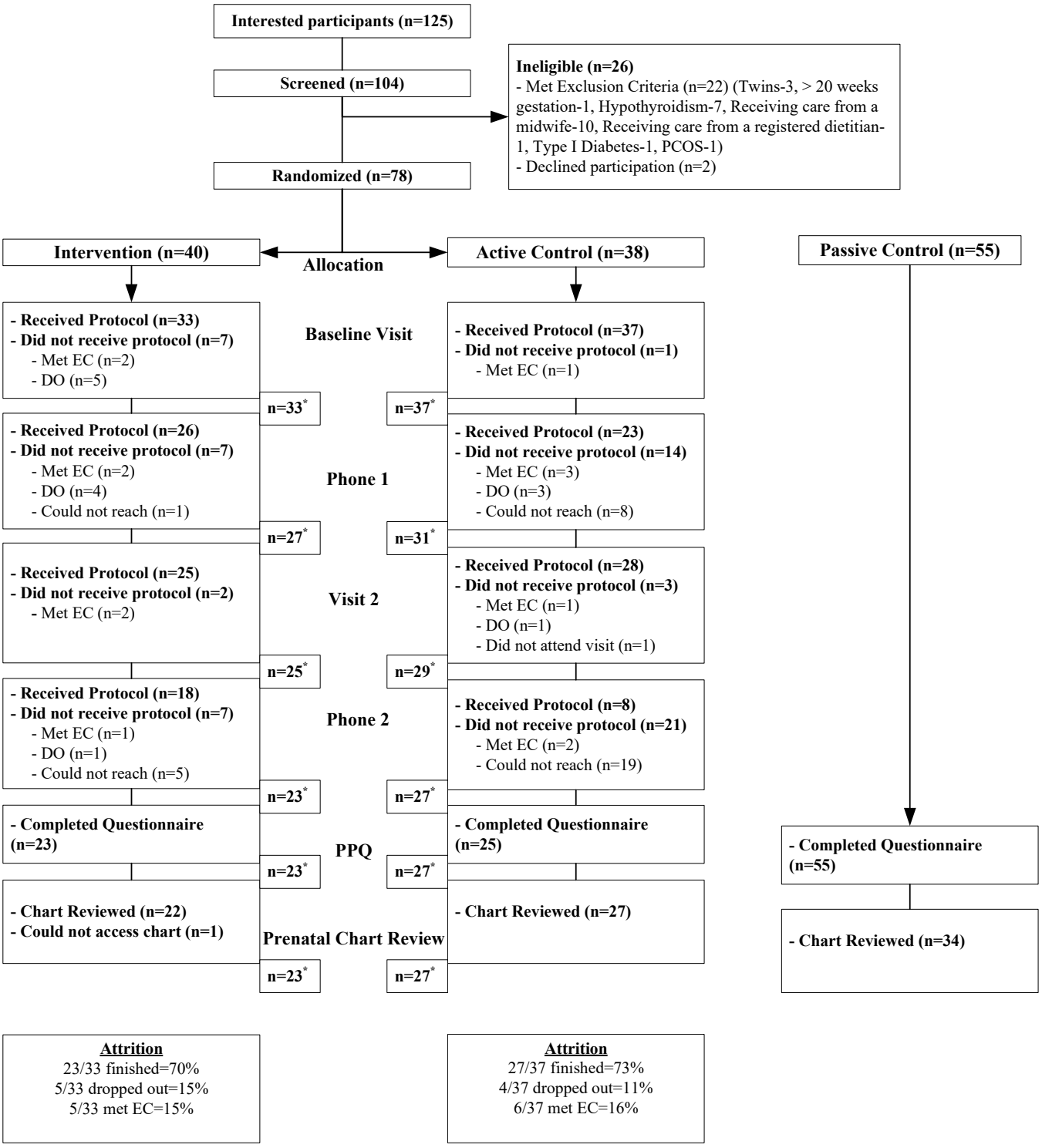
Between June and July 2016, a postpartum passive control group (PC, n=55) was recruited using the same recruitment methods used to recruit the INT and AC group. Women were eligible for the PC group if they were $\leq$12 months postpartum, had experienced a low-risk pregnancy and a singleton birth, could read and speak in English and had not consulted with a RD during their pregnancy. Those in the PC group completed a near similar postpartum questionnaire online and within this, reported their height, pre-pregnancy weight, highest weight in pregnancy, demographic information, and their infant's birth weight and length (p255-265, Appendix). Women in the PC were given the option to provide their healthcare number, and for those who consented (n=34), their prenatal medical records were reviewed by the study team. Women in the PC group did not attend any study visits or receive any phone calls. The flow of participants through the study is shown in Figure 4.2.

All women in the study were asked to provide their healthcare numbers so that researchers could access their medical records. Between 1-9 months after the infant was born, the antenatal and delivery medical records were reviewed for all women who provided a healthcare number (p235-242, Appendix).

Figure 4.2: Flow of participants through the study.

*Active participants: number eligible to receive protocol. If a participant was deemed "could not reach" or "did not attend visit", they were still considered to be active participants.

EC= Exclusion criteria, DO= Dropout, PPQ= Postpartum Questionnaire



Detailed Description of Intervention and Active Control Study Groups

Intervention Group (INT)

The intervention RD completed the training for HCS 3 months prior to beginning this study. Details of the training process are outlined in Lawrence et al[49], and are described in Figure 4.1. Briefly, HCS is an approach used by HCP to guide patients/clients through a process of identifying a change they want to make, reflecting on their lifestyle behaviors, identifying and understand barriers they face when attempting to change, and identifying solutions to these barriers that are feasible within their life.[49] The HCS approach emphasizes using three key skills: asking Open Discovery Questions (typically questions beginning with What or How), active listening, and supporting clients to set a SMARTER goal (Figure 4.1).[49] The HCP's role is to support the individual to make healthy behavior changes that are tailored to their life context, and are feasible to sustain. Relatively less emphasis is placed on providing information to clients. HCS skills encourage a client-centered approach to care as participants guide the topic and content discussed in each visit.[49,180] Examples of HCS questions are shown in Table 4.2. In this study, the INT RD worked with each participant in the INT group to complete questionnaires and assessments at each of the study visits. The INT RD used women's answers to questions as an opportunity to initiate discussions about health, weight, nutrition/healthy eating and other related behaviours with women using HCS. Any SMARTER goals that the participant had set were followed up and reinforced during in-person visits and each telephone call. After each visit or phone call, the INT RD recorded notes from the visit. The SMARTER goals the participants made, any questions the participant asked, and the amount of time for the interaction were recorded. Further, the INT RD completed the 5As for Healthy Pregnancy Weight Gain checklist after baseline and study visit 2. This was to record what topics were covered throughout the visit, however this did not provide guidance to the intervention as the intervention was use of HCS. (p183-193, Appendix). The purpose of the INT phone calls were to ensure continued study eligibility, remind the participant to complete the emailed questionnaires, follow-up on previous discussions, and to review any SMARTER goals that may have been set at a previous interaction. The first phone call included scheduling of study visit 2.

Table 4.2: Examples of Healthy Conversation Skills Questions
- How do you feel about making that change? - How is your weight tracking this pregnancy? - What do you know about how much weight you should gain in pregnancy? - What has worked in the past? - What have you tried to resolve that craving? - How has your eating changed? - What is your main motivation for _____? - What could help you make this change? - What steps do you need to take to make this change happen? - How did you feel after attending the fitness class? - What can you do tomorrow to be proud of? - How will you know when you have achieved your goal?

Active Control Group (AC)

The AC RD was not trained, nor aware of the HCS techniques used within the study. This RD was trained to assist the participants in completing the same questionnaires as the INT group, but without initiating discussion of lifestyle-related topics, nor identification of behaviour change goals. If participants asked questions while completing the questionnaires the AC RD answered them, provided they were within the scope of her professional practice. Any questions the AC participants asked were recorded in the AC RDs notes, in addition to the length of the study visit or phone call (p172-176, Appendix). The purpose of the AC phone calls were to ensure continued study eligibility and to remind the participant to complete the emailed questionnaires. The first phone call included scheduling of study visit 2.

A comparison of the study protocol used in each study group is included in Table 4.3.

Table 4.3: Comparison of Protocol used between Intervention and Active Control Study Groups		
Timepoint	**Participants Completed**	
	Intervention Group	**Active Control Group**
Baseline Visit: *In-person interaction*	- Consent Form[1] - Initial Questionnaire[1] - Baseline Lifestyle Questionnaire[2] - ASA-24-Hr Dietary Recall[1]	- Consent Form[1] - Initial Questionnaire[1] - Baseline Lifestyle Questionnaire[2] - ASA-24-Hr Dietary Recall[1]
Phone 1: *Phone call interaction*	- ASA-24-Hr Dietary Recall[1]	- ASA-24-Hr Dietary Recall[1]
Visit 2: *In-person interaction*	- Week 30 Lifestyle Questionnaire[2] - ASA-24-Hr Dietary Recall[1]	- Week 30 Lifestyle Questionnaire[2] - ASA-24-Hr Dietary Recall[1]
Phone 2: *Phone call interaction*	- Week 34 Lifestyle Questionnaire[1] - ASA-24-Hr Dietary Recall[1]	- Week 34 Lifestyle Questionnaire[1] - ASA-24-Hr Dietary Recall[1]
4 Weeks Postpartum:	- Postpartum Questionnaire[1]	- Postpartum Questionnaire[1]
Note: [1] Participant completed independently. [2] Participant completed in conjunction with study RD.		
Timepoint	**Registered Dietitian Completed**	
	Intervention Registered Dietitian *Healthy Conversation Skills approach was utilized during interactions.*	**Active Control Registered Dietitian** *No specific communication approach was utilized.*
Baseline Visit: *In-person interaction*	- Anthropometric & Study Notes-INT Group - Post Visit Notes-INT Group (includes 5As for Healthy Pregnancy Weight Gain Checklist)	- Anthropometric & Study Notes-AC Group
Phone 1: *Phone call interaction*	- Anthropometric & Study Notes-INT Group - Post Visit Notes-INT Group	- Anthropometric & Study Notes-AC Group
Visit 2: *In-person interaction*	- Anthropometric & Study Notes-INT Group - Post Visit Notes-INT Group (includes 5As for Healthy Pregnancy Weight Gain Checklist)	- Anthropometric & Study Notes-AC Group
Phone 2: *Phone call interaction*	- Anthropometric & Study Notes-INT Group - Post Visit Notes-INT Group	- Anthropometric & Study Notes-AC Group

Note: All documents listed above (either completed by the participant or RD) are included within the Appendix.

4.2.2 Sample Size

The study sample size of 70 for the INT and AC groups was based on an expected 3.6 kilogram difference in weight gain during pregnancy between groups (16 + 4.5 vs 12 + 4.5kg, $\propto$=0.05, $\beta = 0.2$). The 3.6 kilogram difference was decided based on data from the Alberta Pregnancy Outcomes and Nutrition (APrON).[219] This was thought to be a clinically relevant difference in weight gain. This study is not powered to assess secondary outcomes. In June 2016, the postpartum PC group (n=54) was added to control for any effects of women conferring with a RD. The power calculation was not changed to incorporate the third study group (PC). Thus, the sample size could be insufficiently powered to detect differences in the primary outcome of total gestational weight gain between the 3 study groups.

4.2.3 Assessment Tools & Data Collection

The timeline participants followed and the timing of the questionnaire completion is displayed in Figure 4.3. Further explanation of the assessment tools utilized follows.

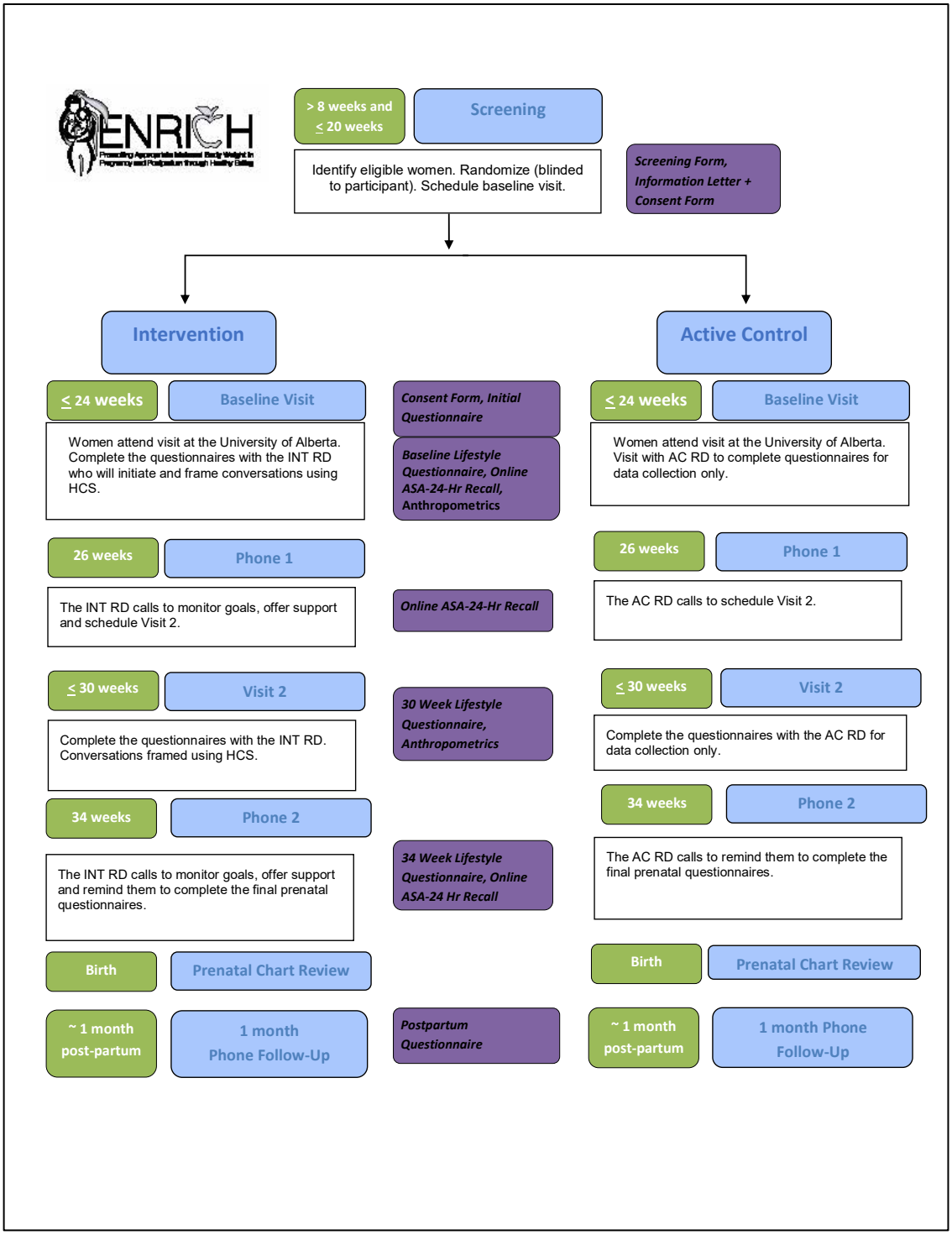


Figure 4.3 Participant flow, data collection points and assessment tools utilized.

Initial Questionnaire

The demographic characteristics collected about the participants were maternal age, pre-pregnancy BMI, gestational age at screening, born in Canada (yes, no), ethnicity (Caucasian, other: Black, Chinese, Filipino, Japanese, Korean, South Asian, South East Asian, other), household income (less than $20 000, $20 000-$40 000, $40 000-$69 000, $70 000-$99 000, $100 000 or more), education (less than high school diploma, high school diploma, trade/technical/community college, university undergraduate degree, post-graduate degree), marital status (single-never married, married, common-law/living with partner, divorced, separated) and parity (nulliparous, 1 or more children, no live births) (p138-140, Appendix). In general, these questions were based on those asked by Statistics Canada in national surveys. The household income levels were expanded to account for higher incomes in Alberta, compared to the national average.

Lifestyle Questionnaire

The lifestyle questionnaire was developed by the study team (RD & Professor in Human Nutrition) and collaboration with researchers from the University of Southampton. Some questions are sourced from other research groups (referenced below). The women completed the lifestyle questionnaire at baseline (p141-171, Appendix), visit 2 (p194-222) and week 34 (p223-234).

Participant Perceived (overall) Dietary Adherence: Participant's perceptions of their dietary adherence to national dietary recommendations was assessed using an adapted version of the Perceived Dietary Adherence Questionnaire (PDAQ).[220] This questionnaire was originally developed to be used by people with diabetes and has internal and test-retest reliability and evidence of criterion validity.[220,221] The questionnaire consisted of 9 questions, each scored using a scale from 0 – 7, asking about the number of days/week a woman ate in accordance with a particular dietary recommendation. The 7 dietary components assessed included an estimated intake of sugary foods, fibre-containing foods, omega-3-containing foods, healthy oils, foods rich in folate or folic acid, foods high in saturated fat, and fast food consumption. Questions which asked about sugar, fat, alcohol and fast food intake were reverse scored. The number of days women thought they adhered to the national food-intake guidelines: *Eating Well with*

Canada's Food Guide[100] was scored similarly (0 – 7 for number of days adhering to EWCFG), and the number of weeks/month women believed they adhered to EWCFG was also assessed (scored 0 – 4). The maximum score for PDAQ was 60.

Physical Activity: Activity levels were assessed by self-report using the validated Pregnancy Physical Activity Questionnaire (PPAQ).[222] This questionnaire has been deemed reliable (test-retest reliability) and valid (criterion validity). Results of the questionnaire tabulated total activity, sedentary activity, light, moderate, vigorous-intensity activity, household/caregiving, occupational, and sports/exercise activity. Activity intensity was calculated from scores from this questionnaire that were converted to an average weekly energy expenditure in MET-h•week^{-1} (time*intensity).

Postpartum Questionnaire

The postpartum questionnaire was developed by the study team (RD & Professor in Human Nutrition), with some questions sourced from other research groups (referenced below) (p243-254), Appendix).

Satisfaction with study: Participants responded to questions asking about their satisfaction with participation in the study on a 5-point Likert scale ranging from Strongly Disagree (1 point) to Strongly Agree (5 points). Their response was recorded for the following 2 statements: 1) Participating in this study increased my awareness of healthy lifestyles in pregnancy; and 2) participating in this study helped me to improve at least some of my lifestyle habits. These questions have not been previously validated.

Satisfaction with Interactions with respective Study RD: Questions from this section were adapted from the Quality of Prenatal Care Questionnaire (QPCQ) developed and tested by Heaman et al in cross-section of women from different geographic locations in Canada.[223] The questionnaire was deemed reliable (internal consistency reliability) and valid (construct and convergent). Participants responded to questions asking about their satisfaction with the care they received from their respective RD in the study on a 5-point Likert scale ranging from

Strongly Disagree (1 point) to Strongly Agree (5 points). Their response was recorded for the following 11 statements:

1) I found the additional interaction with the Registered Dietitian helpful
2) I felt having access to a Registered Dietitian complimented the care I received from my family doctor, OB/GYN well
3) My study Registered Dietitian was patient
4) My study Registered Dietitian respected my knowledge and experience
5) I feel I received adequate information about my diet during pregnancy
6) My study Registered Dietitian was interested in me and how this pregnancy was affecting my life
7) My study Registered Dietitian was available when I had questions or concerns
8) My study Registered Dietitian gave helpful answers to my questions
9) I felt at ease with my study Registered Dietitian
10) My study Registered Dietitian took time to listen
11) My study Registered Dietitian took time to ask about things that were important to me.

The postpartum questionnaire completed by the PC group did not include the above constructs. The data collected from this group's postpartum questionnaire is not within the scope of the thesis, however the data collection tool can be seen in the Appendix (p255-265).

Data Collection from Medical Records

The information abstracted from the women's antenatal and delivery medical records included: induction (yes-induced, no-spontaneous, trial of labour after previous caesarean-section), delivery mode (Spontaneous Vaginal Delivery, Assisted Vaginal Delivery, caesarean-section) and degree of laceration (none, 1^{st}, 2^{nd}, 3^{rd}, episiotomy). The following information about the infant was also collected: gestational age at birth, prematurity (pre-term <37 weeks, term $\geq$ 37 weeks), sex (male, female), birth weight, birth length, and size for gestational age (GA) (large-for-GA: >90%ile/appropriate-for-GA: 10-90%ile/small-for-GA: <10%ile) (p235-242, Appendix).

Note: A list of all variables collected within this pragmatic RCT are provided on pages 124-125 of the Appendix. Only some of the variables collected are within the scope of this thesis.

4.2.4 Assessment of Protocol Fidelity

Eight visits were audio-recorded by each RD. At baseline, the AC and INT RD each recorded visits with 4 different participants. At study visit 2, each RD audio-recorded visits with 4 participants. After study completion, all 16 audio recordings were transcribed verbatim. Two reviewers independently coded the transcripts based on a Healthy Conversation Skills competence scoring tool to assess the level to which each RD asked open discovery questions and encouraged participants' self-reflection on their health behaviours. The INT RD received a score of 3 out of 4 indicating that they showed 'evidence of asking open discovery questions to explore content or plan change'. In contrast, the AC RD only asked questions from the questionnaires except for 2 occasions in the recorded sessions, in which she deviated from the questionnaire and provided these participants with information only. The AC RD did not encourage participants to reflect on their personal context or barriers to behaviour change. The AC RD received a score of 0 from the competency tool.

4.2.5 Data Analysis

For this pragmatic RCT, per protocol analysis was completed. Data was analyzed using STATA 14.2 (StataCorp. 2015. Stata Statistical Software: Release 14. College Station, TX, USA: StataCorp LP). Descriptive statistics were calculated for all quantitative study variables. Chi-square was used to examine differences between groups for categorical variables and Fisher's exact test was used when >25% of the expected frequencies were less than 5. Differences between groups for continuous variables were examined using t-tests or ANOVA as appropriate. A p-value of <0.05 (two-tailed) was considered statistically significant.

Primary Objective and Analysis

The primary objective of this thesis was to compare the GWG of women in the INT group whose RD used HCS, to women in the AC group whose RD did not use HCS. Additionally, the PC group of women who had not seen a RD during their pregnancy was included in these analyses. GWG was calculated as the difference between the participant's highest weight

recorded in their prenatal chart and their self-reported pre-pregnancy weight. For women in the PC group who chose not to provide their healthcare number to study staff, their self-reported highest gestational weight was used for analysis. Weekly rate of weight gain was calculated using the difference between the highest weight and the weight recorded nearest to 13 weeks. Women who developed edema in pregnancy were excluded from weight gain and rate of weight gain calculations (INT:n=3, AC:n=1, PC:n=4). Concordance with Canadian GWG guidelines[60] were determined by comparing a participant's weight gain to that recommended based on their pre-pregnancy BMI. Their concordance was then categorized as follows: below, within or above the guidelines. Logistic regression was used to examine the relationships between pre-pregnancy BMI category and GWG guideline. The maternal covariates of age, gestational age, household income, education and parity were included in the models.

Secondary Objective and Analysis

A secondary objective was to compare differences in perceived dietary intake and physical activity behaviours, during pregnancy, for women in the INT and AC groups. A total PDAQ score and an average weekly physical activity score was calculated for each INT and AC participant at baseline, 30 weeks (visit 2) and 34 weeks. Perceived dietary adherence scores were scored out of a potential total of 60, and differences between groups were tested with a two-tailed t-test. Physical activity was scored (MET-hr/week) using the validated scoring system for the PPAQ.[222] Impossible physical activity scores were removed, and imputed with the mean of the scores deemed within reason. Differences between groups were tested with a two-tailed t-test.

Third Objective and Analysis

The third objective was to compare the overall study satisfaction with participation in the study for women in the AC and INT groups. Responses for each construct were scored, with a maximum score of 5 (indicating "strongly agree") for each construct. Differences between groups were tested with a two-tailed t-test.

4.3 Results

4.3.1 Participant Characteristics (INT, AC, PC)

On average, women in this study were in their early thirties, had self-reported pre-pregnancy BMI within the normal range, and entered the study early in their 2nd trimester of pregnancy. Most were Canadian born, well-educated and approximately half of them had an annual family income greater than $100 000 (CAD). There were no differences between groups for most of the demographic characteristics assessed (Table 4.5). The PC group was approximately 2 years younger than the INT and AC groups (p=0.022).

The CONSORT diagram for the study is presented in Figure 4.2. Seventy-eight women were randomized into the study groups: 40 in the INT and 38 in the AC group. Between randomization and the baseline visit, 7 INT participants were lost from the study as they met the exclusion criteria (n=2; miscarriage (n=1), incompetent cervix (n=1)), were too busy (n=2) or were lost to follow-up (n=3). One AC participant met the exclusion criteria as she obtained care with a midwife. A total of 70 women attended the baseline visit (n=33 INT, n=38 AC). For the INT group, 23/33 (70%) women completed the study. Throughout the study, 10/33 (30%) women from the INT group were either excluded as they met the exclusion criteria (n=5; 15%: gestational diabetes mellitus (n=4), hypothyroidism (n=1)) or dropped-out (n=5; 15%). For the AC group, 27/37 completed the study. Throughout the study, 10/37 (27%) were either excluded as they met the exclusion criteria (n=6; 16%: gestational diabetes mellitus (n=3), doctor prescribed bedrest (n=1), obtained care with a midwife (n=2)) or dropped out (n=4; 11%). At the end of the study, 23 INT women remained active participants within the study and 27 AC women remained active. The attrition in the INT group was 30% (10/33) (15% dropped out, 15% met exclusion criteria) and 27% (10/37) in the AC group (11% dropped out, 16% met exclusion criteria). The number of completed questionnaires for each study group is shown in Table 4.4.

Table 4.4 Number of completed Questionnaires for each Study Group			
	Intervention	**Active Control**	**Passive Control**
Initial Questionnaire	33/33	37/37	--
Baseline Lifestyle Questionnaire	32/33	37/37	--
Week 30 Lifestyle Questionnaire	25/25	28/29	--
Week 34 Lifestyle Questionnaire	20/23	24/27	--
Postpartum Questionnaire	23/23	25/27	55/55
Prenatal Chart Review	22/23	27/27	34/34

From the PC group, 55 women completed the postpartum questionnaires. With all three groups combined, information about total gestational weight was available for 104 participants. After removing 8 participants who developed edema (INT: n=3, AC: n=1, PC: n=4), gestational weight data from 96 women were used for analysis (INT: n=19, AC: n=26, PC: n=51). Prenatal charts were reviewed for 83 women (INT: n=22, AC: n=27, PC: n=34). We were unable to review the prenatal chart for 1 women in the INT group, however she provided her infant's birthdate, gestational age, birthweight and gender through self-report.

The average gestational age was 16.2±3.8 weeks at the baseline visit, and 29.3±1.2 weeks at study visit 2. For telephone follow-up calls 1 and 2 the mean gestational age at the time of the phone calls was 26.5±0.9 and 34.6±0.9 weeks, respectively. The timing of the visits and telephone calls did not significantly differ between the INT and AC groups.

An imbalance in protocol dose was noted between the INT and AC groups at the 2 phone calls portions of the protocol. For phone 1, 26/27 (96%) of the INT group received the INT protocol, however only 23/31 (74%) of the AC group received the AC protocol at phone 1. Of the 50 remaining participants at phone 2, 18/23 (78%) of the INT group received the intervention as per INT protocol at the phone 2, however only 8/27 (30%) of the AC group received the AC protocol at phone 2. At the study visits, protocol dose was similar between the two groups.

Table 4.5 Demographic characteristics of women enrolled in study				
	Intervention (n=33)	Active Control (n=37)	Passive Control (n=55)	p-value
	mean (SD)	mean (SD)	mean (SD)	
Age (years)	34.4 (5.1)	34.4 (4.1)	32.1 (4.2)	0.022
Pre-Pregnancy BMI kg/m ^{2}	25.3 (5.8)	24.6 (5.1)	24.2 (4.4)	0.608
Gestational Age at Screening (weeks)	14.7 (3.9)	13.3 (3.7)	--	0.116
	Intervention (n=33)	**Active Control (n=37)**	**Passive Control (n=55)**	**p-value**
	% (count)	**% (count)**	**% (count)**	
Born in Canada	81.8% (27)	83.8% (31)	89.1% (49)	0.599
Caucasian Ethnicity	75.8% (25)	86.5% (32)	85.5% (47)	0.408
Household Income ≥ $100,000	57.6% (19)	54.1% (20)	67.3% (37)	0.403
Education Bachelor Degree or Greater	63.6% (21)	70.3% (26)	70.9% (39)	0.755
Married or Common-Law	97.0% (32)	94.6% (35)	96.4% (53)	0.918
Pre-Pregnancy BMI Group:				
Underweight	6.1% (2)	2.7% (1)	1.8% (1)	0.599
Normal Weight	48.5% (16)	59.5% (22)	65.5% (36)	
Overweight	24.2% (8)	24.3% (9)	23.6% (13)	
Obese	21.2% (7)	13.5% (5)	9.1% (5)	
Parity :				
Nulliparous	48.5% (16)	64.9% (24)	--	0.474
1 or more children	42.4% (14)	29.7% (11)	--	
No live births	9.1% (3)	5.4% (2)	--	

4.3.2 Gestational Weight Gain (INT, AC, PC)

Total GWG was similar in all study groups (Table 4.6), with a mean weight gain of 14.5(4.5) kg, and a range from 4.1-24.2 kg (n=96). The rate of gestational weight gain in trimesters two and three also did not vary significantly among study groups and overall was 0.53(0.16) kg/week (n=74). A figure visually displaying the rate of weight gain by pre-pregnancy BMI category and guideline concordance is provided on page 122 and 123 of the Appendix. Concordance with GWG guidelines did not differ between the three study groups (Table 4.6). GWG was obtained for 19 of the 33 women in the INT group who attended the baseline visit

(57.6%) and 26 of the 37 women in the AC group (70.2%). This corresponded to 47.5% (19/40) of women randomized to the INT and 68.4% (26/38) of women randomized to the AC group.

Table 4.6 Gestational Weight Gain by Study Groups

	Intervention		Active Control		Passive Control		p-value
	Mean (SD)	**Count**	**Mean (SD)**	**Count**	**Mean (SD)**	**Count**	
Total Gestational Weight Gain (kg)	13.6 (4.3)	19	15.4 (4.0)	26	14.4 (4.8)	51	0.620
Underweight	18.7 (0.0)	1	16.2 (0.0)	1	10.9 (0)	1	0.644
Normal Weight	14.9 (2.1)	8	15.5 (3.3)	16	15.3 (4.2)	34	
Overweight	13.1 (4.0)	5	14.8 (5.3)	6	13.7 (5.4)	11	
Obese	11.1 (6.4)	5	16.4 (6.7)	3	10.8 (6.3)	5	
2nd & 3rd Trimester Rate of Gestational Weight Gain (kg/week)	0.50 (0.15)	19	0.60 (0.15)[a]	25	0.49 (0.15)[b]	30	0.997
Underweight	0.50 (0.00)	1	0.38 (0.00)	1	--	0	0.901
Normal Weight	0.56 (0.07)	8	0.63 (0.15)	16	0.51 (0.11)	19	
Overweight	0.49 (0.14)	5	0.56 (0.17)	6	0.51 (0.19)	7	
Obese	0.41 (0.24)	5	0.54 (0.05)	2	0.40 (0.27)	4	
IOM 2009 Guideline Concordance:	**Count (Percentage)**		**Count (Percentage)**		**Count (Percentage)**		
Below	1 (5 %)		1 (4%)		7 (14%)		0.755
Within	8 (42%)		12 (46%)		21 (41%)		
Above	10 (53%)		13 (50%)		23 (45%)		

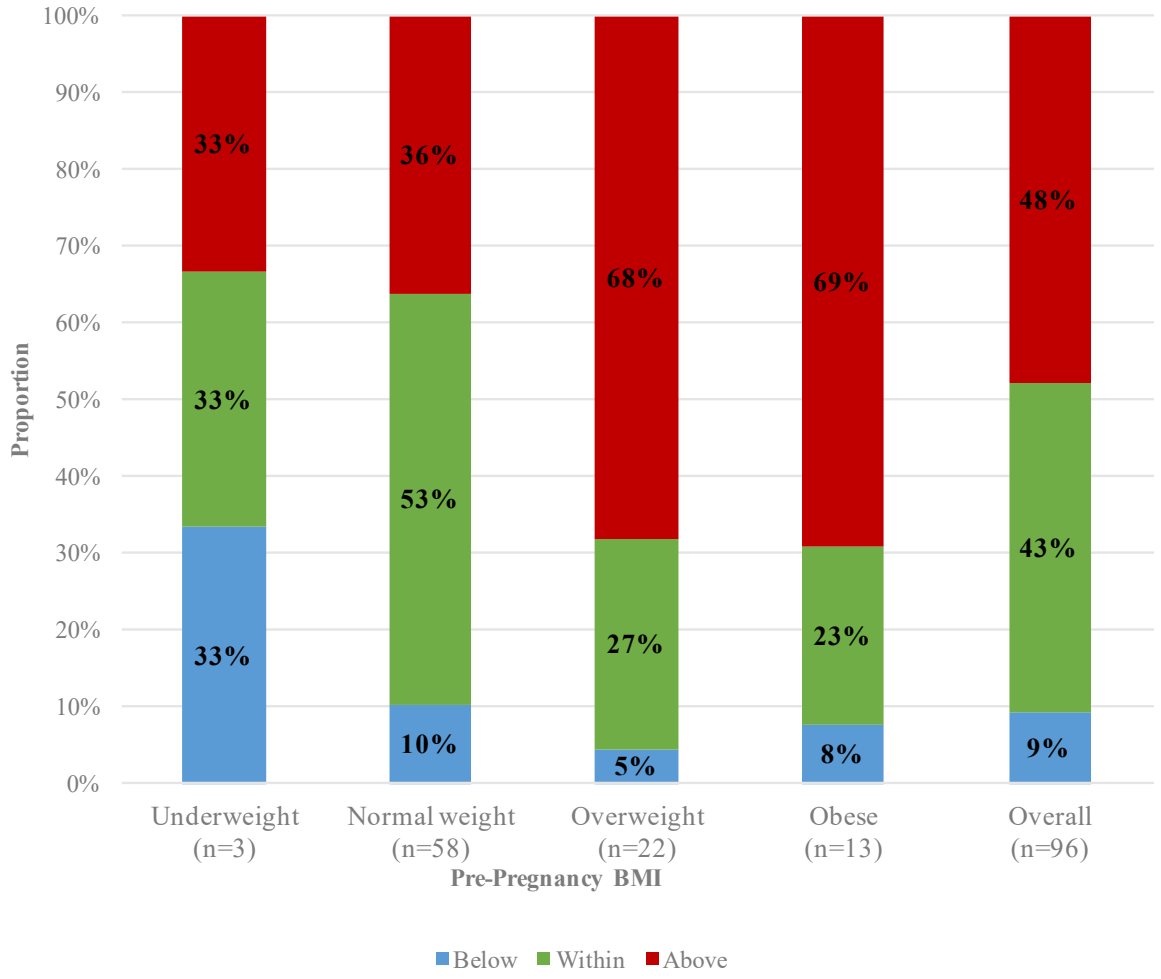
Overall, 10%, 43% and 48% of the participants' weight gain was below, met or exceeded Health Canada/IOM GWG guidelines, respectively. The relationship between pre-pregnancy BMI category and guideline concordance was assessed in each study group separately (Table 4.7). In the AC group, there was an association between pre-pregnancy BMI category and guideline concordance (p=0.011). Therefore, a formal test for interaction between study group and pre-pregnancy BMI on GWG guideline concordance was completed, however, no significant association with the interaction was observed.

Table 4.7: Pre-Pregnancy BMI Group and Guideline Concordance by Study Group				
Intervention (n=19)	**Below**	**Within**	**Above**	p-value
Underweight & Normal Weight	0% (0)	32% (6)	16% (3)	0.106
Overweight & Obese	5% (1)	11% (2)	37% (7)	
Active Control (n=26)	**Below**	**Within**	**Above**	p-value
Underweight & Normal Weight	4% (1)	42% (11)	19% (5)	0.011
Overweight & Obese	0% (0)	4% (1)	31% (8)	
Passive Control (n=51)	**Below**	**Within**	**Above**	p-value
Underweight & Normal Weight	12% (6)	29% (15)	27% (14)	0.455
Overweight & Obese	2% (1)	12% (6)	18% (9)	

Groups within each study group compared using a Fisher's exact test.

When stratified by pre-pregnancy BMI category, guideline concordance differed significantly (p=0.033), with 68% of the overweight and 69% of the obese women exceeding the guidelines compared with 36% and 33% of women within a normal and underweight BMI, respectively (Figure 4.4). After adjusting for maternal covariates, age, gestational age, household income, education, parity, women in the overweight and obese pre-pregnancy BMI category were less likely to meet the Health Canada/IOM GWG guidelines (OR: 0.13, 95% CI 0.03-0.59, p=0.008), compared with those women in the underweight and normal pre-pregnancy BMI categories. None of the other maternal characteristics included in the model were found to be associated with gestational weight gain (all p >0.05).

Figure 4.4 Guideline Concordance by Pre-Pregnancy BMI



4.3.3 Obstetric and Neonatal Outcomes (INT, AC, PC)

Overall, participants attended on average 9.8 (2.7) prenatal visits with their community HCP (range: 2-16). Of the 75 participants included within this visit count, the majority saw an OB/GYN (49%), while 28% received care from both an OB/GYN and family physician, and 20% received care from a family physician only. Overall, the mean gestational age at delivery was 39.4(1.5) weeks (n=84), with a range of 34.6-41.4 weeks. Onset of birth was spontaneous with 63% of the women, while 36% were induced. Seventy-nine percent of the women gave birth vaginally, with an assisted delivery required in 17% (i.e. forceps and/or vacuum) of the vaginal births. Of those who delivered vaginally, most (79%) acquired a second-degree tear or

less, and 10% had an episiotomy. Twenty-one percent of the women delivered via Cesarean-section. The rate of pre-term birth was 9.5% (8/84). The average birthweight of the 83 babies was 3.45(0.51) kg (n=84), and 51% of the babies were female. Eighty-eight percent of babies were born an appropriate size for their gestational age (within the 10-90%ile), while 6% were born large-for-gestational age and 6% were born small-for-gestational age. One infant was born stillborn. Obstetric and infant outcomes did not differ among the INT, AC and PC groups (Table 4.8).

Table 4.8: Obstetric and Neonatal Outcomes				
	Intervention (n=23)	**Control (n=27)**	**Passive Control (n=34)**	**p-value**
OBSTETRIC				
	n=22	**n=25**	**n=30**	
Total Number of Prenatal Visits	10.3 (3.0)	9.5 (2.9)	9.7 (2.3)	**0.614**
Gestational age at birth	**n=23**	**n=27**	**n=34**	
Gestational age	39.9 (0.8)	39.1 (1.7)	39.3 (1.6)	**0.114**
Pre-term	0% (0)	19% (5)	9% (3)	**0.085**
Term	100% (23)	81% (22)	91% (31)	
Induction	**n=22**	**n=26**	**n=33**	
Induced	45% (10)	23% (6)	39% (13)	**0.167**
Spontaneous	50% (11)	77% (20)	61% (20)	
Trial of labour after previous c/s	5% (1)	0% (0)	0% (0)	
Delivery	**n=22**	**n=27**	**n=33**	
Spontaneous	55% (12)	59% (16)	70% (23)	**0.166**
Assisted	32% (7)	19% (5)	6% (2)	
Cesarean birth	14% (3)	22% (6)	24% (8)	
Lacerations	**n=16**	**n=16**	**n=26**	**0.407**
None	0% (0)	0% (0)	8% (2)	
1st Degree	19% (3)	25% (4)	35% (9)	
2nd Degree	56% (9)	44% (7)	46% (12)	
3rd or 4th Degree	6% (1)	25% (4)	4% (1)	
Episiotomy	19% (3)	6% (1)	8% (2)	
NEONATAL				
	n=23	**n=27**	**n=34**	
Birthweight (mean)	3531.5 (480)	3470.7 (558.9)	3389.4 (487.9)	**0.577**
Size-for-gestational age	**n=22**	**n=26**	**n=34**	
Small-for-gestational age (SGA)	9% (2)	8% (2)	3% (1)	**0.844**
ppriate-for-gestataional age (AGA)	86% (19)	85% (22)	91% (31)	
Large-for-gestational age (LGA)	5% (1)	8% (2)	6% (2)	
Gender	**n=23**	**n=27**	**n=33**	
Female	52% (12)	48% (13)	52% (17)	**0.952**
Male	48% (11)	52% (14)	48% (16)	

Note: Data collected from the antenatal and delivery medical records. SGA-small for gestational age, AGA-appropriate for gestational age, LGA-large for gestational age

4.3.4 Lifestyle Behaviours in Pregnancy (INT, AC)

At baseline, the mean perceived dietary adherence of the participants were significantly higher in the AC group (35.1±9.0) compared to the INT group (28.9±7.7) (p=0.0037; n=69). There was no significant difference between the INT and AC study groups in mean dietary score at visit 2 and week 34 of pregnancy. However, between baseline and visit 2, the mean perceived dietary adherence score of the INT women significantly increased (28.9±7.7 to 34.2±7.2, p=0.0012), while the AC group did not significantly change their perceived dietary adherence score (35.1±9.0 to 36.2±9.4, p=0.5370) (Table 4.9). Physical activity was similar for both study groups at all time points. At 34.4(0.86) weeks AC women reported being sedentary for 3 MET-hr/week more than INT women (p=0.0073) (Table 4.10). There was no significant difference in self-efficacy for healthy eating or exercise behaviours between the groups, nor were there any significant changes in this throughout the study.

Table 4.9 Self-reported dietary intake assessed with the Perceived Dietary Adherence Questionnaire (PDAQ).

	BASELINE		VISIT 2		WEEK 34	
Dietary Component	**Intervention (n=32) days/week**	**Active Control (n=37) days/week**	**Intervention (n=25) days/week**	**Active Control (n=28) days/week**	**Intervention (n=20) days/week**	**Active Control (n=24) days/week**
	mean (SD)	mean (SD)	mean (SD)	mean (SD)	mean (SD)	mean (SD)
Followed EWCFG [a]	2.1 (1.5)	3.3 (1.2)	3.0 (1.2)	3.5 (1.3)	2.3 (1.0)	2.6 (1.1)
Sugar	4.4 (2.5)	4.2 (2.0)	5.2 (2.1)	4.3 (2.0)	4.9 (2.1)	4.5 (1.9)
Fibre	5.4 (2.1)	5.5 (1.6)	5.8 (1.8)	6.2 (1.4)	5.3 (2.3)	5.9 (1.4)
Omega 3	3.1 (2.6)	2.8 (2.2)	4.1 (1.9)	3 (2.3)	3.5 (1.6)	2.9 (1.8)
Healthy Oils	3.2 (2.4)	4.0 (2.1)	3.5 (2.1)	4.0 (2.2)	3.2 (2.0)	3.5 (2.3)
Folic Acid	3.3 (1.8)	3.8 (2.0)	3.9 (2.1)	3.6 (1.9)	2.8 (1.7)	3.0 (1.6)
Saturated Fat Foods [b]	4.5 (2.1)	3.4 (2.2)	4.2 (2.1)	3.9 (2.5)	3.0 (1.5)	3.1 (2.3)
Fast Food [b]	2.3 (2.0)	1.4 (1.4)	2.0 (1.4)	1.5 (1.4)	2.0 (1.2)	1.3 (1.1)
Total PDAQ Score (/60)	**28.9 (7.7)***	**35.1 (9.0)***	**34.2 (7.2)**	**36.2 (9.4)**	**32.2 (7.4)**	**34.5 (9.4)**

[a] EWCFG: Eating Well with Canada's Food Guide [b]The diet components 'saturated fat foods' and 'fast food' were reverse scored in the total PDAQ score *Between the INT and AC groups, there was a significant difference in mean dietary scores at baseline $p<0.05$

Note: Self-reported dietary intake was assessed using the perceived dietary adherence questionnaire. The mean gestational at the time of assessment was: Baseline: 16.3 (3.8) weeks; Visit 2: 29.3 (1.2) weeks; Week 34: 34.4 (0.9) weeks. The units are number of days in a week the participant self-reported eating that food. The questions were phrased as follows: "On how many of the last SEVEN DAYS did you eat_____?". An additional component 'how many weeks of the last month did you follow EWCFG' is not included in the table, but was worth a maximum score of 4. This component is still within the Total PDAQ Score calculation; for a maximum total PDAQ score of 60.

Table 4.10: Self-reported physical activity assessed with the Pregnancy Physical Activity Questionnaire (PPAQ).						
	BASELINE		**VISIT 2**		**WEEK 34**	
Type of Activity	**Intervention (n=32)**	**Active Control (n=37)**	**Intervention (n=24)**	**Active Control (n=28)**	**Intervention (n=20)**	**Active Control (n=24)**
	mean (SD)	mean (SD)	mean (SD)	mean (SD)	mean (SD)	mean (SD)
Sedentary activity	8.1 (6.1)	9.8 (7.2)	8.3 (10.8)	8.0 (4.5)	4.8 (1.5)*	7.8 (4.4)*
Moderate intensity	41.6 (29.1)	49.6 (33.5)	38.3 (31.2)	41.9 (23.5)	43.8 (34.7)	38.7 (30.0)
Vigorous intensity	2.7 (4.5)	3.4 (5.4)	2.2 (3.1)	2.1 (3.6)	0.87 (2.2)	0.57 (1.5)
Sports/exercise	12.9 (13.1)	15.1 (10.3)	14.8 (10.5)	12.7 (9.2)	10.7 (10.2)	9.8 (9.5)
Total activity of light intensity and above	116.4 (21.1)	116.0 (19.6)	116.9 (27.9)	126.3 (28.9)	117.1 (34.3)	117.6 (19.9)

*Between the INT and AC groups, there was a significant difference in mean Sedentary activity scores at Week 34 $p<0.05$

Note: The self-reported physical activity was assessed using the pregnancy physical activity questionnaire. The mean gestational at the time of assessment was: Baseline: 16.3 (3.8) weeks; Visit 2: 29.3 (1.2) weeks; Week 34: 34.4 (0.9) weeks. The units are metabolic hours/week (MET-hr/week).

4.3.5 Study Experiences (INT, AC)

Postpartum, INT women were more likely to strongly agree that participating in the study "improved at least 1 of my lifestyle habits" compared to AC women (p=0.009). INT women were more likely to strongly agree that participating in the study "was beneficial" (p=0.070) compared with AC women, although the difference bordered on significance. INT women also were more likely to agree or strongly agree that their study RD "asked about things important to me" (p=0.056). The INT group more often strongly agreed to the statement: "My study RD was interested in me and how this pregnancy was affecting my life" (p=0.077) compared to the AC group (Table 4.11). Although non-significant, a trend towards significance was found for the INT more strongly agreeing their participation was beneficial (p=0.070). Regardless of their group allocation, 60% and 65% of the participants (INT and AC) agreed or strongly agreed the study was beneficial and increased their awareness of healthy lifestyles.

Table 4.11: Mean Agreeance Score to Perspectives of Study Experience Statements

Statement	Intervention (n=23)	Active Control (n=25)	p-value
	mean (SD)	mean (SD)	
Participating in the study improved at least 1 of my lifestyle habits.	4.00 (0.67)	3.48 (0.65)	0.009
Participating in this study was beneficial for me.	3.91 (0.79)	3.56 (0.51)	0.070
Participating in this study increased my awareness of healthy lifestyles in pregnancy.	3.83 (0.78)	3.72 (0.54)	0.584
I felt at ease with my study RD	4.43 (0.95)	4.24 (0.66)	0.410
My study RD took time to listen	4.35 (0.93)	4.16 (0.69)	0.429
My study RD took time to ask about things that were important to me	4.22 (1.0)	3.68 (0.90)	0.056
My study RD was available when I had questions or concerns	4.04 (0.93)	3.68 (0.63)	0.116
My study RD gave helpful answers to my questions	4.17 (0.89)	3.92 (0.70)	0.275
I feel I received adequate info about my diet during pregnancy	3.78 (1.0)	3.68 (0.80)	0.695
My study RD was interested in me and how this pregnancy was affecting my life	4.09 (0.95)	3.64 (0.76)	0.077
I found the additional interaction with the RD helpful	3.83 (0.94)	3.76 (0.66)	0.778
I felt having access to a Registered Dietitian complimented the care I received from my family doctor, OB/GYN well:	3.83 (1.07)	3.60 (0.76)	0.402
My study RD respected my knowledge and experience	4.26 (0.86)	4.04 (0.62)	0.323

Note: Questions included on the postpartum questionnaire. Participants were asked to think about the care they received from their study RD when completing the questions. The last 10 statements were adapted from the Quality of Prenatal Care Questionnaire developed by Heaman et al.[223]

4.4 Discussion

4.4.1 Findings between INT & AC groups

Overall, our findings demonstrate that compared with the AC group, the INT group significantly improved their perceived dietary adherence scores between the baseline visit and study visit 2, were significantly less sedentary at week 34, and were more likely to strongly agree that their participation helped them to improve at least one of their lifestyle habits. There was a non-significant trend for the INT group to more strongly agree that their study RD took time to ask about things that were important to them and showed interest in them and how the pregnancy was affecting their life. No difference in GWG outcomes was found between the three study groups.

This is the first study to assess the impact of HCS on patient outcomes related to gestational weight gain. Previous research has found significant improvement in confidence ratings of front-line staff trained in HCS (play workers, family support workers, community development workers, administrative staff, community health nurses and dental health workers) when discussing healthy eating and exercise with vulnerable women and young families, compared to those not trained in HCS.[127] Our positive patient outcomes highlight promise for the use of HCS as a communication technique for HCPs to initiate and continue lifestyle related conversations with pregnant women. These conversations were found to positively influence patient behaviours, but will need to be further elucidated with larger trials.

The finding that the INT group made more lifestyle changes than the AC group exemplifies the potential positive impact that HCP could have by using open-ended questions to initiate healthy lifestyle change. Examples of changes the women made within the study were recorded qualitatively, and thus, will be analyzed in future analyses. However, a similar study, completed by Skouteris et al, utilized a health coaching intervention that allowed women to choose their own lifestyle goals.[168] Only 8% of women chose the specific goal to achieve a healthy GWG.[168] The remaining goals were related physical activity (49.6%), energy levels (15%), nutrition management (17.7%) and psychological related factors (9.8%).[168] This study, as with our own, noted no difference in total GWG between the group who received health coaching, compared to the control group whom received education alone.[168] However, unlike our study, Skouteris et al did not assess women's achievement of lifestyle goals. This makes it difficult to fully appreciate any benefits derived from the health coaching compared to education

alone. Women in this study and our own identified goals that may not be specifically weight related, but that encouraged improvement of lifestyle behaviours and that are important to overall health. If an individual chooses goals that are most salient to them, the likelihood a behaviour change will be made increases.[153,154] Promotion of self-chosen goals could lead to healthy behaviour changes within pregnancy, and ultimately contribute to improved maternal health and appropriate GWG. Previous work by our research group indicate that pregnant women face many diet and lifestyle-related changes and that they are likely to have a personal hierarchy of behaviours that that they are able and willing to change within the short period of time of pregnancy.[102,224] Our study participants were not recruited based on their willingness to focus on GWG as a goal of their pregnancy, which could have increased the likelihood that we observed differences between our groups. That approach, however, would be unrealistic in a clinical setting, thus we chose to explore the variation in behaviours as this is highly relevant to practice, although differences in GWG are more difficult to detect.

After the release of the 2009 GWG guidelines, the IOM published recommendations for HCPs to follow when using the guidelines.[131] In addition to weighing women at every prenatal visit, the IOM recommends HCPs discuss the measured weight with every woman by discussing guideline concordance, followed by an individualized nutrition and physical activity discussion.[131] HCPs previously suggested a lack of confidence to start and continue a conversation related to gestational weight gain/healthy lifestyles, and a lack of skills to prompt behaviour change[37,39,40] was a barrier to these discussions. HCS and the use of open discovery questions, appears to be a promising technique for HCPs to use when discussing weight and lifestyle behaviours including diet and physical activity. Previous research found front-line staff to report the skills within HCS easy to use in practice.[127] Further, our positive improvements in physical activity and dietary outcomes, in addition to findings that INT women more strongly agreed that their study RD both took time to ask about things that were important to them ($p=0.040$), and was interested in how this pregnancy was affecting their life ($p=0.053$), may point to the effectiveness of a lifestyle conversation grounded in the three key skills of HCS: 1) asking open discovery questions, 2) active listening, and 3) supporting clients to set a SMARTER goal.

The 3 key skills of HCS appear to be an important and integrated combination to promote behaviour change. The first skill, uses questions starting with *What* or *How* (open discovery

questions) to prompt individual reflection, barrier resolution, and guide an individual through creating step-wise actions to behaviour change.[49] Other studies have found that pregnant women appreciate such questions from a HCP as it leads them to personally reflect on their lifestyle habits.[225] It is hypothesized that effective HCP questioning exemplifies caring. The second skill, active listening, allows the woman to be heard, and allows the HCP to better appreciate the client's life context.[49] With the combined use of open-ended questions and active listening, the third skill, setting a SMARTER goal, can occur as a collaborative effort between HCP and woman. If an individual is involved in their goal setting, they feel more in control of the behaviour[183], which increases the likelihood a behaviour change will be made.[154] A sense of accountability can be fostered when follow-up questions are be asked at future visits. Thus, HCS seems to be an accessible approach to initiation and follow-up of lifestyle-related conversations by prenatal HCPs. Future studies in this area should continue to document the effects of this approach on behaviours. Starting the discussions about lifestyle changes in pregnancy could be practical because of the high frequency of interaction between HCP and women during regular prenatal visits. Some investigators also suggest that women may be highly motivated to adopt healthy behaviours during pregnancy since it can positively affect the health of her future child as well as her own health.[141,226]

4.4.2 Findings between AC, PC and INT groups

There was no significant difference in total GWG, rate of GWG, nor adherence to the guidelines between the 3 study groups. When stratified by BMI category, and after adjusting for covariates, women with an overweight or obese BMI were more likely to gain weight in excess of guidelines. This has been found in previous Canadian studies.[18-20,62]

4.4.3 Overall

This is the first study to assess the impact of HCS on patient outcomes, particularly those related to GWG. Although the use of HCS within this pragmatic RCT did not change GWG outcomes, the conversation technique holds promise for assisting women in reducing sedentary behaviours and improving perceived dietary scores. Because of study attrition and the per-protocol analysis, the study may not have been adequately powered to find differences between the study groups in regards to GWG. Further, the imbalance in protocol dose between the two

groups may be a limitation. This imbalance occurred at the phone calls, and was due to receiving participants' voicemail instead of speaking to them. This happened despite the study RDs leaving numerous voicemails (up to 3 as per protocol). The study protocol was followed, however the participant did not receive the protocol as we were unable to reach them via phone. The purpose of phone 1 was to book the next visit, remind them to complete the questionnaires and to ensure their medical conditions remained the same. Phone 2 was solely a reminder to complete the questionnaires and to ensure their medical conditions remained the same. As the AC group phone calls were logistic related, there may not be a major impact of speaking with the participant directly and leaving a voicemail message about the study. However, these methodological limitations should be addressed in future studies assessing HCS.

Overall HCS appears to allow a woman to discuss her life context with a HCP and for these two parties to collaboratively problem solve toward making a healthy change.[49] This type of model may be empowering to the individual since they have an increased sense of control and input into the changes undertaken rather than just receiving advice.[49,180] There are a multitude of factors that influence the amount of weight a woman gains in pregnancy, including dietary intake, food availability, food accessibility, food acceptability physical activity, demographic factors, psychosocial factors, knowledge and personal self-efficacy; HCPs need to be aware of the context each woman lives within. Every woman faces a unique set of factors within her life, thus, value exists in the HCP developing a better understanding of each woman and the environment she lives in, in order to help individualize her care.

HCPs may be able to provide client-centered care that is relevant to the individual's personal context more effectively and efficiently by using HCS and by using proportionally less time providing education in a didactic manner and more time learning about the patient and her living situation.[49,180] The Society of Obstetrics and Gynecologists Clinical Practice Guidelines on Female Nutrition (2016), emphasize the importance of assessing a woman's social determinants of health through an ongoing discussion throughout pregnancy.[101] It must be understood that a woman's priorities in pregnancy may not be weight, nutrition or exercise. Abstaining from alcohol or drugs, or finding a safe home may be of a greater priority. The benefit of the HCS technique is that it can be adapted to support any woman, from any background, in any life situation. Starting and continuing a discussion about healthy lifestyles is important throughout pregnancy. Since women may have increased receptiveness to make healthy changes at this life

stage[6-8], supportive discussions may positively help to impact behaviours. Further, training HCPs in HCS could further assist HCPs engage more clients in their own care. High patient engagement has been shown to increase HCPs understanding of the patients' health beliefs and values, which shapes further care.[227] Training HCPs in HCS could help HCPs foster stronger relationships and allow clients to be partners in their own care.

It is clear from this and other studies that interventions focusing on a single component of a behaviour change framework is unlikely to produce wide-spread behaviour changes across groups of women all facing different challenges in their lives. The current study demonstrated that RDs using HCS was effective in helping women feel that they had a higher degree of social (HCP) support for making healthy lifestyle changes. This is necessary and therefore should be explored in further studies, however, since weight gain in pregnancy is complex, it is not sufficient to promote appropriate GWG in all women. Additional supports for behaviour change are clearly needed to improve reach and overall effectiveness of interventions. Evidence from the substance abuse literature has shown value in an intervention consisting of brief advice, compared to a 10-week counselling intervention. Both programs found the same results up to 2 years later.[228] With the short duration of pregnancy, early promotion of behaviour change is likely to be most effective.

4.5 Conclusion

When a RD utilized the HCS communication technique to discuss healthy lifestyles in pregnancy, women reported positive outcomes in their behaviours related to dietary intake and physical activity. Compared to AC group, the INT group significantly improved their perceived dietary scores between the baseline visit and the second visit, were significantly less sedentary at week 34, and were more likely to strongly agree that their participation did help to improve at least one of their lifestyle habits. Further, there was a non-significant trend for the INT group to more strongly agree that their study RD took time to ask about things that were important to them. The change in lifestyle behaviours and the increased sense of support from the RD that was reported from the INT group demonstrates the potential use of HCS to approach to initiate, and continue discussions surrounding healthy lifestyles. These client-centered discussions have potential to empower the client to feel in control of their own health behaviours, which increases likelihood for the healthy behaviour changes to be successful. Training HCPs in this technique

has potential to improve the confidence of HCPs in initiating and continuing weight and lifestyle related conversations. Future research is needed to address the methodological limitations highlighted in this study that could help to reduce bias. Additionally, the practicality of HCS integration into prenatal care visits needs to be trialed. If HCPs could have ongoing lifestyle conversations that successfully improve the number of women who live healthy lifestyles in pregnancy, health across generations could improve.

Chapter 5: General Discussion and Conclusion

To address the rising obesity epidemic, a multi-pronged effort to improve health must reach individuals across the entire lifespan. Points of contact with HCPs are opportunities for individuals to discuss healthy lifestyles with a health expert. For most women, pregnancy is a period when the frequency of visiting a HCP is increased. Motivation to be healthy for the health of the unborn infant is also high.[151,226] The multiple interaction points during pregnancy could provide an opportunity for HCPs to encourage and positively support women to adopt and maintain healthy lifestyles.[40,229] Studies of HCPs have indicated their need for communication techniques that are practical and effective to use within the context of prenatal appointments. .[128] This thesis evaluated a client-centered communication technique, HCS, as a means to initiate and continue healthy lifestyle discussions in pregnancy. The findings are unique to the literature as this is the first study to look at the behavioural outcomes, health outcomes, and perspectives of participants who received additional lifestyle support in pregnancy delivered using HCS techniques. We are also the first group to implement the HCS approach in Canada.

5.1 Principle Findings of Thesis

5.1.1 Research Question #1:

The first research question was to investigate the influence of the use of HCS had on total GWG and rate of GWG. Overall, total GWG, rate of weight gain and Health Canada/IOM GWG guideline concordance between the three study groups did not significantly differ (INT, AC & PC). The relationship between pre-pregnancy BMI category and guideline concordance was also assessed in each study group separately. In the AC group, there was an association between pre-pregnancy BMI category and guideline concordance. However, after a formal test for interaction, no significant association with the interaction was observed. When the three groups were stratified by pre-pregnancy BMI category, guideline concordance differed significantly, with 68% of the overweight and 69% of the obese women exceeding the guidelines compared with 36% and 33% of women in the normal and underweight BMI groups, respectively. Findings demonstrated that women in the overweight and obese pre-pregnancy BMI category were more likely to have a negative association with meeting the Health Canada/IOM GWG guidelines compared to women in the underweight and normal pre-pregnancy BMI categories, after

adjusting for the maternal covariates of age, gestational age, household income, education and parity.

5.1.2 Research Question #2:

The second research question assessed the impact of HCS on women's lifestyle behaviors. Our findings show that there was a significant improvement in mean perceived dietary adherence score of women in the INT group between the baseline visit and visit 2; there was no significant improvement in the AC group. Between the INT and AC study groups, there was no significant difference in mean perceived dietary score at week 30 or week 34 of pregnancy. Physical activity was similar for both study groups at all time points. At week 34 in pregnancy, the mean sedentary time reported by the INT group was significantly less than the AC group. The impact of HCS on psychosocial factors such as weight control, self-efficacy for healthy eating and exercise behaviours, and sense of support were not significant, but should be further studied in larger trials.

5.1.3 Research Question #3:

The third research question examined women's perceptions of participating in the study. The women in the INT group were more likely to strongly agree that their participation helped to improve at least one of their lifestyle habits. There was a non-significant trend for the INT group to more strongly agree that their study RD took time to ask about things that were important to them and showed interest in them and how the pregnancy was affecting their life. Although not statistically significant, there was a trend towards the INT group more strongly agreeing that their participation was beneficial compared with the AC group.

5.1.3 Objective F:

One of the objectives of this thesis was to evaluate the effectiveness of paid advertisements on Facebook as a platform for recruiting pregnant women to a pragmatic randomized controlled trial in comparison with traditional recruitment approaches. Paid Facebook advertisements helped to recruit women at a significantly earlier gestational age compared to traditional recruitment approaches, since those recruited through Facebook were on average 2 weeks earlier in gestation than those recruited through traditional approaches.

Recruitment through Facebook advertisements was a practical means of recruitment in terms of overall cost and the rate of participant recruitment. Our findings highlight the importance of combining novel and traditional recruitment techniques when recruiting women to pregnancy-related research studies.

5.2 Discussion

5.2.1 Overall Findings

Overall, our findings suggest that there were significant findings between the INT group who received care from a RD using HCS and the AC group whose RD did not utilize HCS. The improvement in lifestyle behaviours the INT women reported making is a positive finding as behaviour changes made within pregnancy can contribute to the health of a woman, her child, and may be the beginning of a sustained change that could lead to long-term lifestyle habits. Despite some behavioural changes, we did not observe differences in either total GWG or rate of GWG between the INT and AC groups.

Follow-up support from HCPs is useful to address barriers and help women find solutions toward positive behaviour change. In our study, women received follow-up from their study RD through 2 phone calls and a second study visit. At these follow-up points of contact, the INT RD utilized the three skills of HCS: asking open discovery questions, active listening and setting of SMARTER goals. Use of HCS within this study is an approach to engage patients in shared decision-making and explores topics that the patient wants to discuss. Our data suggests that use of HCS increased participants' perceptions of the care their RD provided, as the INT group shows a non-significant trend to more strongly agree that their study RD asked about things that were important in their life, compared to the participants receiving care from the AC RD. Previous research has highlighted the value of HCPs asking questions to prompt reflection on one's lifestyle behaviours.[225] The questions also prompt a discussion that may allow the HCP to be aware of their patient's context, while building trust and rapport. Establishing a trusting relationship can allow the HCP and woman to collaboratively find changes that can be made to improve lifestyle behaviours. Discussing the facilitators and barriers of a healthy lifestyle change may allow the woman to feel more in control of her behavior.[154,183] When one feels in control of their behaviours, there is an increased likelihood that a change will be made.[154,183] Additionally, because the INT women made their own goals, they likely chose goals they were prepared to

commit changing. Although the RD use of HCS did not directly result in better rates of guideline concordant GWG, the findings that INT women viewed their care more positively, made positive improvements to diet quality and physical activity behaviours, and were more likely to strongly agree that their study participation initiated improvement in one of their lifestyle behaviours is promising. Further research over a prolonged duration, (e.g. extension into the postpartum period) could help elucidate how behaviour changes in pregnancy and improved support during this time may translate into long term behaviours and improved health outcomes.

5.2.2 A Recommendation for Prenatal HCPs: Start a Conversation by Asking Questions

Previous research reporting on results from focus groups with postpartum women have suggested that lack of discussion about weight or nutrition creates a perception that HCPs are not concerned with these issues and that weight and nutrition in pregnancy are not important.[36] Both the IOM and Health Canada recommend that healthy weight, nutrition and physical activity in pregnancy be discussed with all pregnant women.[27,60] HCS appears to be a practical approach to normalizing the GWG discussion. Open discovery questions such as such as "I discuss weight gain with every pregnant woman, what are your thoughts on talking about weight gain in pregnancy today?" or ""‘, how is your weight tracking this pregnancy?" could be utilized by a multidisciplinary team of HCPs providing prenatal care. Normalizing weight-related discussions re-positions this topic to be a part of routine care; similar to the routine clinical practice of measuring blood pressure.

Provision of care in a client-centered manner has been reported by women and HCPs as a vital aspect to high quality prenatal care.[230] Use of HCS promotes the care to be guided by the client, which aligns closely with client-centered care initiatives currently prioritized locally and worldwide.[231,232] Provincially, Alberta Health Services (AHS) has a formal initiative: the "Patient First Strategy" that emphasizes four prioritized recommendations to involve patients in a partnership of their own care.[231] Their definition of patient-centered care is care that: "*considers patients' cultural traditions, their personal preferences and values, their family situations, and their lifestyles. It makes patients and their loved ones an integral part of the care team who collaborate with health care professionals in making clinical decisions*".[231] Within HCS, the open-ended style of questions, the active listening, and the creation of goals together, appropriately addresses this type of care. One of the four prioritized recommendations are to

"*enhance communications*" between HCP and patient.[231] HCS is a communication technique that could be incorporated into the training of HCPs to enhance patient & family-centered communication. Globally, a movement within the National Health Services (NHS) within the United Kingdom has stated that HCPs have a role to "*make every contact count*".[232] This initiative states that regardless of the reason for contact, a HCP should "*use every contact with an individual to maintain or improve their mental and physical health and wellbeing where possible*".[232] Our findings that additional lifestyle conversations with an RD using HCS assists pregnant women in improving at least one lifestyle behaviours highlight the value of capitalizing on the opportunity that a prenatal visit brings, to initiate and continue a healthy lifestyle discussion.

5.2.3 Recommendations for Future GWG Interventions

Our findings previously published in Adam et al[217] (Chapter 3) provide evidence towards the use of social media as a recruitment method for this population. When Facebook advertisements were added to traditional recruitment approaches, recruitment efficiency increased. Additionally, women recruited through Facebook were at an earlier gestational age than women recruited through traditional approaches. Recruiting women of an early gestational for prenatal intervention studies is important[165,211,215], yet has been found previously difficult[213,214]. The ease of placing an advertisement on Facebook, the comparable cost per participant recruited, and the dramatically improved recruitment rates emphasize the benefits of combining novel and traditional recruitment techniques to efficiently recruit women to pregnancy-related research studies. Using novel recruitment techniques, such as using Facebook advertisements, should be considered for future intervention studies.

A second recommendation for future GWG interventions is to consider how to define the success of future GWG interventions. Globally, two large trials have recently looked at the impact of lifestyle interventions on clinical outcomes. Both interventions were grounded in behaviour change theory and involved individualized visits where women discussed barriers to lifestyle change, set lifestyle goals, and self-monitored their behaviours throughout. The LIMIT trial included 2212 overweight or obese women and found their individualized lifestyle support to made no difference in their primary outcomes of: large-for-gestational age infants, rates of pre-eclampsia, and gestational diabetes.[233] However, an improved quality of diet and an

increased quantity of physical activity was found in the INT group compared to the control group.[234] The UPBEAT trial (UK Pregnancies Better Eating and Activity Trial) of 1555 obese pregnant women found no difference in their primary outcomes: rates of gestational diabetes or large-for-gestational age infants.[235] Similar to LIMIT, aspects of the intervention group's diet improved.[235] These well designed, large randomized controlled trials did not see differences in their primary clinical outcomes. Focusing solely on clinical outcomes, could lead to researchers overlooking process-related information that could lead to the development of improved and effective interventions in the future. Our findings show that positive improvements in diet quality and sedentary behaviours may be observed without finding any changes in clinical outcomes, such as total GWG. Improvements in diet, self-efficacy, physical activity, and knowledge should all be encouraged and are likely in the pathway required for successful clinical outcomes. Measuring a single outcome, such as weight, only paints a small picture of the individual's lifestyle behaviours and may ignore smaller changes that may have been made due to an intervention. A novel analysis technique used for primary care research could offer insight into how future GWG intervention studies could be analyzed. When the approach is comprehensive, and is directed based on issues the patient views as salient, different approaches to identify "significance" is likely needed. It is difficult to look at an individual outcome indicator as the power needed to find a difference would be large. Use of a composite index, such as the Summary Quality InDex (SQUID) algorithm may better assess the quality of the applied intervention.[236] A local study, the BETTER trial, has successfully used a composite index to assess a multifaceted preventative intervention in primary care.[237] Assessing outcomes in a comprehensive manner by using a composite index, is a direction future GWG intervention studies could follow because of the complex nature of factors that interact to influence gestational weight gain.

5.2.3 Strengths and Limitations of the Study

There are several strengths to this research. First, the study was designed after conducting an environmental scan for promising practices to prevent excess GWG (Adam et al, unpublished). Important behavior change techniques were incorporated into aspects of the study design. Second, recruitment of the PC group was a strength of this study and allowed us to compare outcomes of the 2 study treatment arms to those observed in a group that received routine prenatal care in Alberta. This allowed assessment of the potential impact of a visit with a

dietitian in the 2 study treatment arms. Most intervention studies do not include a PC group and this makes it more difficult to detect differences in approaches relative to standard care. A third strength was that through our combined recruitment approaches (traditional approaches and Facebook advertisements), we were able to recruit women relatively early in pregnancy as the mean gestational age at the baseline visit was 16.2 (±3.8) weeks. This allowed a reasonable amount of time for HCS to take place and for women to undertake behaviour changes that they identified as important to them. Another strength of our study was the inclusion of fidelity measures through audio-recording of 16 in person visits. A strength and limitation of the study is the pragmatic nature of this RCT. While the pragmatic nature of the trial has benefits in assessment real life effectiveness, the limitation is that the researchers were not blinded to the randomization during recruitment, data collection nor at data analysis. The study RDs were also not blinded to their study group allocation. However, the AC RD was not aware of the skills utilized within HCS and both the INT RD and AC RD had similar levels of professional dietetic experience. An additional limitation is the possibility that other factors (such as personality) differed between the two Registered Dietitians and may have contributed to differences between the two groups.

There are several additional limitations to this research. First, the participants in this study represent a highly educated, high income, group of women. It must be highlighted that these findings characterize what could be considered an ideal group, with few economic or education-related barriers to overcome, in comparison to the general population. The results may not be generalizable to other ethnic groups or more disadvantaged populations. Participants who volunteer for health research studies often have a keen interest in healthy living and may represent a more motivated group in comparison to the general population. It is unknown whether having recruited motivated volunteers lead to larger or smaller differences between groups. Using similar approaches and measures as was used in this study but recruiting women in different ways, for example through doctor's offices only, could help shed light on how personal motivation affects the outcome of our intervention.

Another limitation of the study is the lack of randomization in the PC group. Because recruitment of this group occurred in the postpartum period, women were not randomized to this group. This introduces the possibility of a recall bias in responses to questionnaires in this group since the PC group could have been up to 1 year postpartum. In contrast, data was collected

prospectively in the INT and AC groups. There could also be systematic differences between the groups that we did not measure. However, we attempted to minimize differences through use of the same recruitment methods, the birth of the child had to have happened within the past year, much of the outcome data was determined from information available in the prenatal medical record, which was collected prospectively for all women. Finally, we used similar questionnaires for collection of postpartum data for all groups. A second possible limitation for the PC group, was the option to provide their healthcare number. For those who did not provide access to their prenatal medical record (n=20, 21% of those in the full study), their highest GWG is based on self-report. However, there was no difference in the mean GWG of the PC group with and without the self-reported weights indicating this was not a significant limitation.

Additionally, not all the questions utilized within the study were previously validated. Some of the questions were pilot tested by a small group of study team members but had not undergone rigorous or formal psychometric evaluation. Thus, the reliability and validity of these questions is unclear. However, many of the findings discussed within this thesis were collected using questionnaires that have been previously validated. Further, as this was a pragmatic RCT, the relatively small number of participants at the end of the study led to the study having relatively low power to detect statistically significant differences in total GWG between the INT and AC groups. Power calculations were not re-done after the decision was made to add the third study group, the PC group. Lastly, the analysis was per-protocol analysis rather than intention to treat. Also, there was some imbalance in protocol dose between the groups which could contribute to the differences observed between the groups. The fact that of the 50 remaining participants at phone 2, 18/23 (78%) of the INT group received the intervention as per INT protocol and only 8/27 (30%) of the AC group received the intervention as per AC protocol could influence these outcomes. However, since phone call 2 for the AC group was primarily to remind participants to complete their questionnaires, and not to discuss any aspects of behaviour change, there may not be a major impact of speaking with the participant directly and leaving a voicemail message about the study. Future research should be careful to strive to reduce the methodological limitations observed in this study to better understand how these deviations from protocol could contribute to differences between groups. It will be important to ensure there is sufficient power for the outcomes analyzed, the dose is comparable between the groups. It would also be important to use an intention to treat analysis.

5.3 Future Directions

5.3.1 Future Research Areas

More research is needed to inform how to best improve care for pregnant women with the aim for healthy GWG and improved lifestyles. Overall, when designing GWG intervention studies, it is important the intervention starts as early in pregnancy as possible. Ideally, supporting women to be in their best health and at a healthy weight prior to conception should be prioritized, as women with a normal pre-pregnancy BMI have been found to be nine times more likely to gain within guidelines.[19] Entering pregnancy overweight or obese, regardless of total GWG, is associated with increased cost and use of healthcare services throughout pregnancy and at delivery.[94] With approximately 59% of women of childbearing age in the United States as overweight or obese, the economic burden is substantial.[84] This economic evidence, along with the epidemiological data emphasize the need to promote healthy weights of all women of childbearing age.

Secondly, there is value in teaching self-monitoring skills within the intervention so that women can self-regulate their behaviours if desired.[176,238] These skills provide promote the continuation of these self-monitoring behaviours beyond the intervention and help to improve self-efficacy of the person performing the behaviours. Self-monitoring of diet, physical activity, GWG and other determinants of GWG were neither encouraged or discouraged in this study but could be important to consider in future studies. Thirdly, including interaction points for women to meet others who are concurrently pregnant could encourage peer support and social interaction.[225] Additional benefits can occur if the spouse can be involved, as this support structure can be maintained at home.[111] The positive involvement of woman's spouse is imperative, as husbands have been found to have an impact on a woman's behaviors associated with GWG.[111] Additionally, the type of HCP best suited to support women in pregnancy surrounding lifestyle changes must still be elucidated. Access to a multidisciplinary team, including RDs, registered nurses and exercise physiologists, could be useful to assist with balancing clinical care with the promotion of healthy lifestyles in pregnancy.

Lastly, future research could improve on some of the methodological limitations within this study. It is important to ensure the power is sufficient to detect statistically significant differences between groups for outcomes under analysis. Use of intention-to-treat analysis or use

of a composite index may be more appropriate to assess study outcomes. Further, finding methods to improve the equality of dose applied between the two groups would be beneficial.

5.3.2 Recommendations for Future Research within Healthcare

Future research could trial the use of HCS in practice through four different approaches. First, use of HCS could be integrated within care at the time of completing an assessment or screening form. This time provides an opportunity for the HCP to ask open discovery questions, and may lead to a better understanding of the factors that drive the lifestyle behaviours of a woman. Secondly, changes to the electronic medical record system could prompt or remind HCP to initiate a discussion about weight and healthy lifestyles.[41] The GWG guidelines and/or key questions framed in HCS could pop-up to initiate a conversation. Examples of questions that could be utilized are shown in Chapter 4, Table 4.2 of this thesis. Thirdly, providing women their own weight tracking graph[133] could increase awareness about healthy GWG and may assist with starting a conversation. A study in Hamilton, Ontario provided pregnant women within the intervention group an online weight tracking tool prior to a prenatal appointment.[239] Once the woman used the tool, a printout was created and women were encouraged to take the printout to their prenatal appointment as a discussion starter.[239] As predicted, the intervention group had greater engagement in care as significantly more women reported receiving GWG counselling from their HCP compared to those who did not participate in this online program.[239] Significantly more women in the intervention group were aware of the risks of inadequate weight gain to mother and child.[239] This exemplifies prompts as a simple reminder tool that is beneficial for both the HCP and the woman.

Lastly, supporting women in the postpartum and inter-pregnancy period is often overlooked. Although pregnancy may be seen as a teachable moment, looking solely at pregnancy as the opportune time is only looking at a short-term goal.[147,240] Pregnancy may be an initiator of change, yet for lifestyle habits to be continued beyond 9 months, there is a need for continued support for healthy lifestyles in the postpartum period and beyond. It is vital this is brought to the forefront as postpartum weight retention and/or weight gain increases risk of complications in the next pregnancy related to obesity; a modest increase in 2-3 BMI units increases this risk.[64] Postpartum also presents a time of opportunity as mothers bring newborns for regular appointments with a HCP. This interaction could be a time where supportive HCS

conversations could occur. Various locations, such as within public health centres, new mother classes, primary care clinics could be the setting where these healthy and supportive conversations could occur. More research is needed to understand how to integrate additional lifestyle support within the current healthcare model to ultimately improve the health of women and their families.

5.4 Conclusion

With the ability to influence two generations at once, pregnancy provides an opportune time to promote optimal health across generations. The additional points of contact with a HCP make prenatal visits a favourable time to intervene. Further, the health of the infant is an important driver of healthy lifestyles in pregnancy.[147] Women perceive nutrition as a controllable factor in pregnancy that can directly influence the health of their child.[226] Thus, initiating lifestyle discussions during prenatal care is a great opportunity.

In conclusion, this study assessed a brief communication technique, HCS, trialed by a RD with the aim to support and empower the client to initiate behaviour change. Our recruitment methods exemplify the value of combining novel recruitment techniques (such as Facebook advertisements) to traditional recruitment techniques when recruiting a prenatal population. Our pragmatic RCT findings show that empowering, patient-centered lifestyle conversations grounded in the principles of HCS may positively influence some health behaviours of women during pregnancy. This is promising, as over time, small changes in behaviour may be additive and lead to a positive change in the health trajectory of an individual. Subsequently, improving the health of a mother often translates into improved family health.[241] Training prenatal HCPs in the skills of HCS, may be a reasonable change that could be integrated into existing prenatal care without a large systematic change. More research surrounding the impact of HCS on patient outcomes is needed. Future research is also needed to address the methodological limitations highlighted within this pragmatic RCT. Ultimately, intervening at the prenatal level not only promotes healthy weights and optimal health in the woman, but extends to optimal health in her children, family, and subsequent generations.

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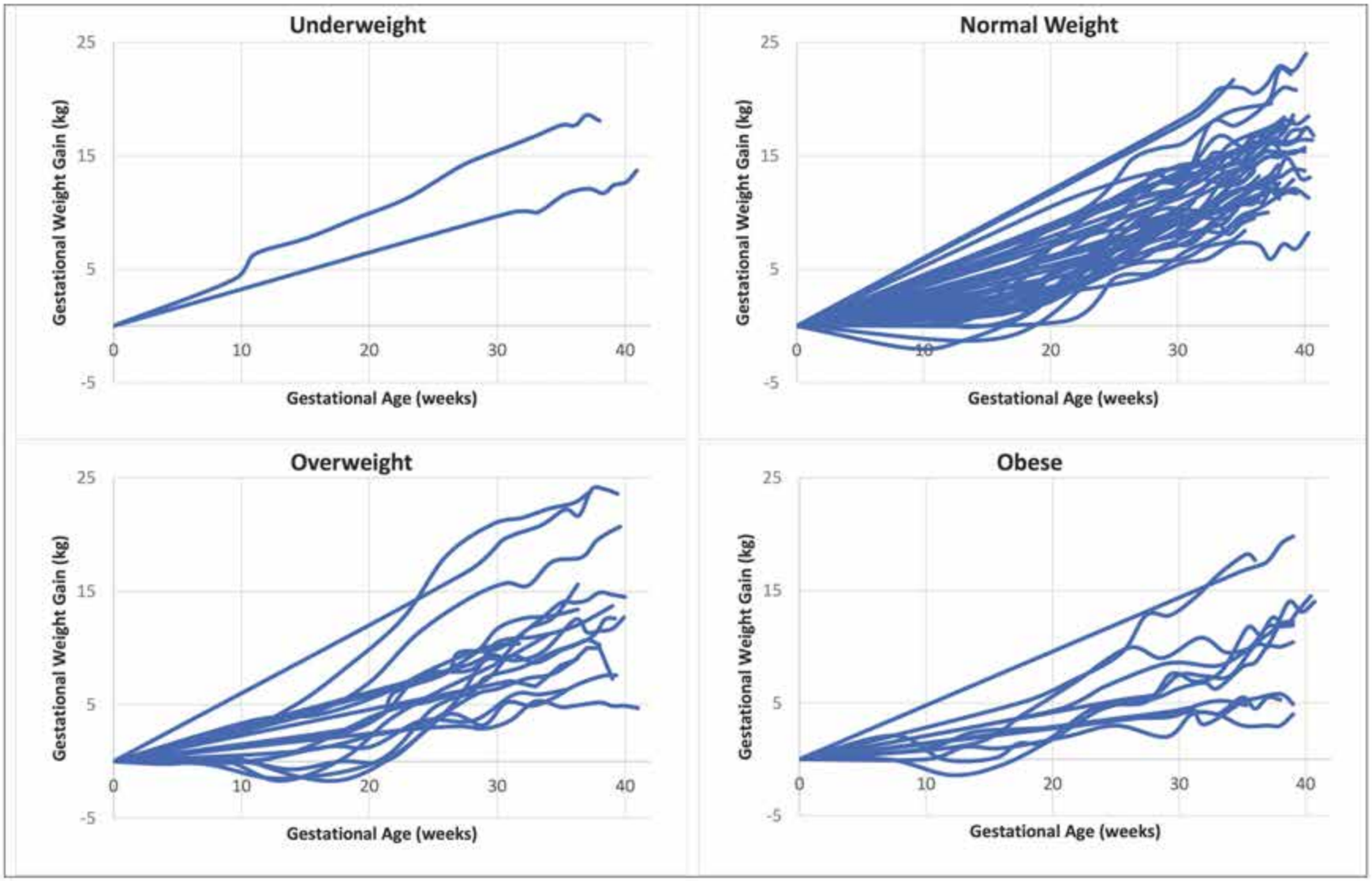
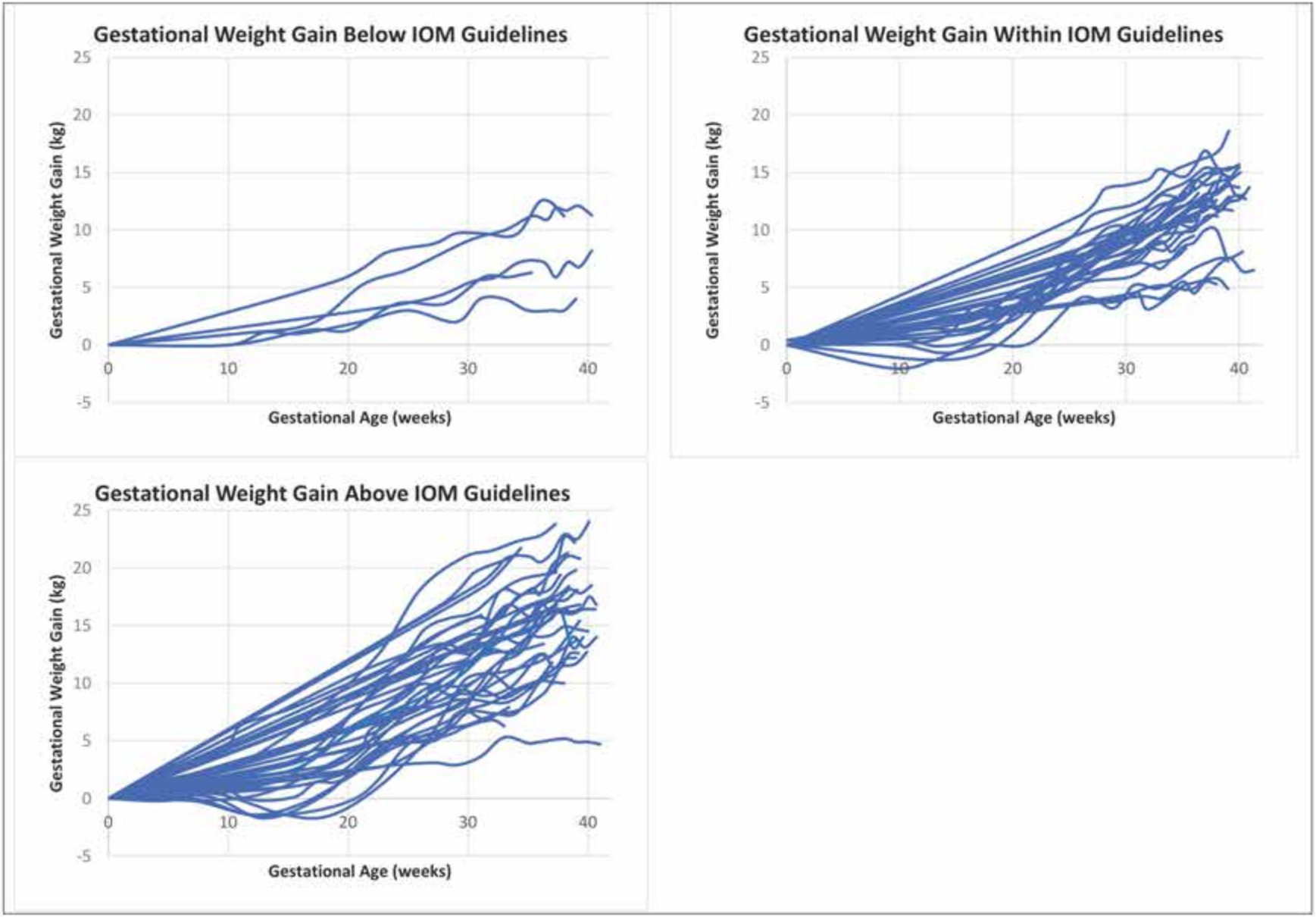
Appendix

Rate of Gestational Weight Gain by Pre-Pregnancy BMI Category (n=71)



Note: Rate of GWG data for participants from all study groups (INT, AC & PC). Underweight n= 2, Normal weight n=41, Overweight n= 17, Obese n= 11

Rate of Gestational Weight Gain by Guideline Concordance (n=71)



Note: Rate of GWG data for participants from all study groups (INT, AC & PC). Below Guidelines n=5, Within Guidelines n=30, Above Guidelines=36

Outcomes Collected *(entire study)*

Outcome	Study Group	Instrument/Assessment Tool
Pre-pregnancy weight *(self-reported)**	O✚▲	Screening Form & Passive Control Group Postpartum Questionnaire
Demographics: Age, Ethnicity, Marital status, Total household income, Highest level of education achieved, Occupation(O✚ only), Parity, Birth spacing (O✚ only)*	O✚▲	Initial Questionnaire & Passive Control Group Questionnaire
Maternal Medical History	O✚	Initial Questionnaire
Expected due date	O✚	Initial Questionnaire
Height *(measured to the nearest 0.1 cm)*	O✚▲	Measured at Baseline Visit, recorded in AC Anthropometric & Study Notes and INT Anthropometric & Study Notes & Passive Control Group Postpartum Questionnaire
Pre-pregnancy BMI* *(calculated using above height and weight)*	O✚▲	Recorded in in AC Anthropometric & Study Notes and INT Anthropometric & Study Notes & Passive Control Postpartum Questionnaire
Vitamin/Mineral intake	O✚	Baseline Lifestyle Questionnaire, 30 Week Lifestyle Questionnaire
Dietary Score (PDAQ Score)*	O✚	Baseline Lifestyle Questionnaire, 30 week Lifestyle Questionnaire, 34 Week Lifestyle Questionnaire
Physical Activity Level in Pregnancy (PPAQ score)*	O✚	Baseline Lifestyle Questionnaire, 30 week Lifestyle Questionnaire, 34 Week Lifestyle Questionnaire
24-hour Dietary Intake	O✚	ASA-24-Hr Dietary Recall at Baseline, 26 weeks and 34 weeks
Current dietary intake, Dietary changes in pregnancy, changes in dietary intake related behaviours, attitude, skills and knowledge	O✚	Baseline Lifestyle Questionnaire, 30 week Lifestyle Questionnaire, 34 Week Lifestyle Questionnaire
Nausea/Vomiting in pregnancy	O✚	Baseline Lifestyle Questionnaire, 30 week Lifestyle Questionnaire, 34 Week Lifestyle Questionnaire, Postpartum Questionnaire
Healthy eating knowledge	O✚	Baseline Lifestyle Questionnaire, 30 week Lifestyle Questionnaire, 34 Week Lifestyle Questionnaire, Postpartum Questionnaire
Topics discussed during counselling sessions	O✚	AC Anthropometric & Study Notes, INT Anthropometric & Study Notes, INT Group Post Visit Notes (completed by INT and AC RD)
Fidelity and dose received during counselling sessions through audio recordings	O✚	INT Anthropometric & Study Notes, INT Group Post Visit Notes (completed by INT RD), Audio recordings (completed by INT and AC RD)
Frequency and Time of Follow-up Contact	O✚	AC Anthropometric & Study Notes, INT Anthropometric & Study Notes (completed by INT and AC RD)
Post Visit Analysis using the 5As Healthy Pregnancy Weight Gain Checklist	✚	INT Group Post Visit Notes (completed by INT RD)
Details about the SMARTER Goals set	✚	INT Group Post Visit Notes (completed by INT RD)

* Included within thesis analysis.

Study Groups: O Active Control (AC) ✚ Intervention (INT) ▲ Passive Control (PC)

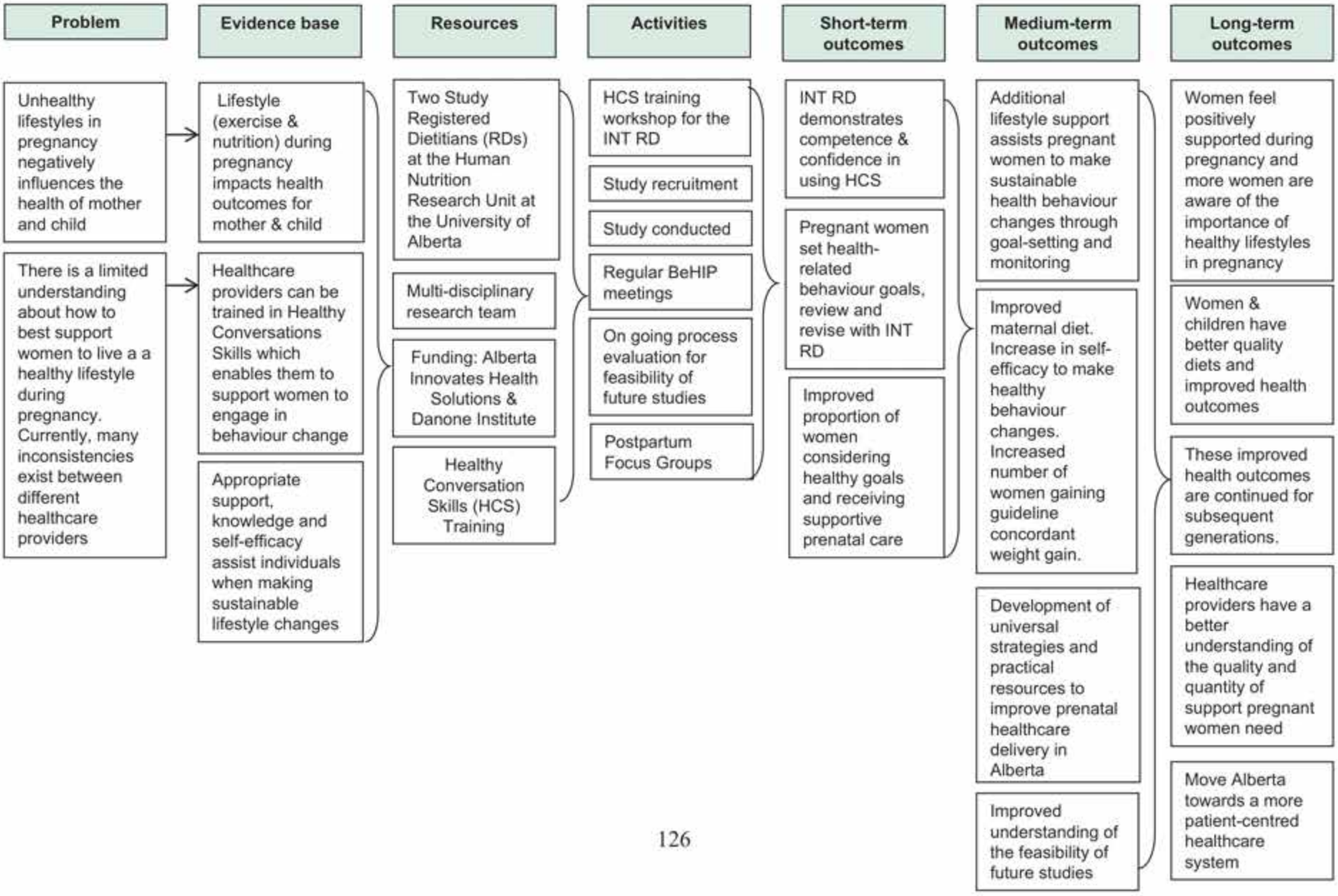
Outcomes Collected *(entire study)*

Outcome	Study Group	Instrument/Assessment Tool
INT RD's Perspective: Openness of the participant to discuss weight, questions that prompted HCS discussion, quantity and quality of HCS used	✚	INT Group Post Visit Notes (completed by INT RD)
Prenatal Care: Date of Visit(s), Gestational weight(s) and Gestational Age*	O✚▲	Prenatal + Delivery Record Chart Review (completed by research team) *(A chart Review will be completed by looking at AB Prenatal Record-Page 2),* Postpartum Questionnaire
Delivery information: Type of Labour*, Augmentation*, Type of Birth*, Laceration*, Blood Loss, Duration of Labour, Cord pH, Meconium Fluid Breastfeeding NICU admission	O✚▲	Prenatal + Delivery Record Chart Review (completed by research team) *(A chart Review will be completed by looking at AB Delivery Record-Part 1 and 2)*
Infant Outcomes: Sex*, Gestational age*, Infant birth weight *, Size for gestational age %ile*, Total APGAR Score at 5 mins	O✚▲	Prenatal + Delivery Record Chart Review (completed by research team) *(A chart review will be completed by looking at AB Delivery Records-Part Two & AB Newborn Records)*
Highest Gestational Weight in Pregnancy*	O✚▲	Postpartum Questionnaire
Adverse Pregnancy Outcomes (Pre-eclampsia, venous thromboembolism, swelling etc.) *	O✚	30 week Lifestyle Questionnaire, 34 Week Lifestyle Questionnaire, Postpartum Questionnaire
Self-efficacy for diet and exercise behaviours in pregnancy* and postpartum	O✚	Baseline Lifestyle Questionnaire, 30 week Lifestyle Questionnaire, 34 Week Lifestyle Questionnaire, Postpartum Questionnaire
Locus of control for weight (prior to pregnancy and during pregnancy)	O✚	Baseline Lifestyle Questionnaire, 30 Week Lifestyle Questionnaire, 34 Week Lifestyle Questionnaire
Support for healthy habits	O✚	Baseline Lifestyle Questionnaire, 34 Week Lifestyle Questionnaire, Postpartum Questionnaire
Perceptions of Overall Health (prior to pregnancy and throughout pregnancy)	O✚	Baseline Lifestyle Questionnaire, 30 week Lifestyle Questionnaire, 34 Week Lifestyle Questionnaire, Postpartum Questionnaire
HCP discussions about healthy GWG, knowledge sources regarding healthy GWG, intentional behaviour changes for weight	O✚▲	Postpartum Questionnaire
Resource use during pregnancy regarding GWG	O✚▲	Postpartum Questionnaire
Perceptions of Quality of Prenatal Care	O✚▲	Postpartum Questionnaire
Acceptability & Feasibility of Intervention	O✚	Postpartum Focus Groups Guide

* Included within thesis analysis.

Study Groups: O Active Control (AC) ✚ Intervention (INT) ▲ Passive Control (PC)

Study Logic Model



UNIVERSITY OF ALBERTA

ENRICH
Promoting Appropriate Maternal Body Weight in Pregnancy and Postpartum through Healthy Eating

Be Healthy in Pregnancy Study

How can we best support YOU to be healthy during pregnancy?

✔ **Are you less than 20 weeks pregnant?**

✔ **Do you have computer and Internet access at home?**

If so, we invite you to participate in our **research study** that will help us understand the **support women** need in **pregnancy to be healthy** for themselves and their child.

What would I have to do?

You are asked to attend **2 study visits** at the University of Alberta to meet with a study healthcare provider one-on-one. Together with the study healthcare provider, you will complete **lifestyle questionnaires** about your health before you became pregnant and your health during your pregnancy. You may also be chosen at random to have **additional support** to explore how to have a healthy pregnancy.

Interested? Have questions?

Contact **Laura** at 780-492-8157 or email behip@ualberta.ca

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Contact: Laura
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Who can participate?

Women living in the Edmonton area or those who can travel to the University of Alberta with ease, and are:

- Between 8 and 20 weeks pregnant
- 20 years of age or older
- Able to access internet and telephone at home

Where does the study take place?

Twice in pregnancy you will come to meet your study healthcare provider in person. This will be at the Clinical Research Unit at the University of Alberta in Edmonton. The Clinical Research Unit is located in the Li Ka Shing Centre for Health Research Innovation building. The address is 8602-112 Street.

Before you come, we will provide you a map. We will also pay for your parking or your transit ticket to the study visits.

How do I join?

If you are interested or have questions, contact **Laura:**

780-492-8157

or

behip@ualberta.ca

The BeHIP study is apart of a larger prenatal and postpartum research study called ENRICH.

You can visit our website at:

http://enrich.ales.ualberta.ca

ENRICH
Promoting Appropriate Maternal Body Weight in Pregnancy and Postpartum through Healthy Eating

Be Healthy in Pregnancy Study (BeHIP)

ENRICH

UNIVERSITY OF ALBERTA

What is the BeHIP study for?

The health and lifestyle behaviours of a mother during pregnancy are important for the long-term health for both her and her baby. Improving the health of a mother during pregnancy can lead to the best health outcomes for mother and child.

We want to find out if additional lifestyle support in pregnancy can help more women live healthier lifestyles and have healthier babies. After this research is complete, we hope to better understand what supports and resources can help more women in Alberta have a healthy pregnancy.

We invite you to participate in this study!

Study Visit (Before 24 weeks gestation): You will come to the University of Alberta and meet with the study healthcare provider (a Registered Dietitian). Together, you will complete questionnaires that ask about your age, education, medical history, diet and lifestyle. You may also be chosen at random to have additional support to explore how to have a healthy pregnancy.

Follow-Up Phone Call (At 28 weeks): Your study healthcare provider will phone you to check in with you, schedule your next clinic visit, and remind you to complete an online questionnaire.

Study Visit (Week 29-30): You will meet your study healthcare provider at the University of Alberta and complete a lifestyle questionnaire.

Follow-Up Phone Call (At 34 weeks): Your study healthcare provider will phone you to check in with you and remind you to complete an online questionnaire.

Brief Questionnaire (Approximately 1 month after birth): You will complete a brief online questionnaire that will ask you a few questions about your pregnancy and feedback about the care you received during pregnancy.

Note: You will still attend your routine prenatal care appointments with your family physician/OB GYN/nurse etc. throughout pregnancy. After your study participation is complete, you will be offered a postpartum nutrition session with a Registered Dietitian as an appreciation for your time to complete the study.

Participant Information Letter

Be Healthy in Pregnancy Study

Investigators:

Dr. Rhonda Bell, Professor
University of Alberta, Department of Agricultural, Food and Nutritional Science
Phone: 780-492-7742
Email: bellr@ualberta.ca

Hara Nikolopoulos, Program Manager
University of Alberta, Department of Agricultural, Food and Nutritional Science
Phone: 780-492-6164
Email: hara@ualberta.ca

Dr. Donna Manca, MD, Director of Research,
University of Alberta, Department of Family Medicine Research
Phone: 780-492-8102
Email: dpmanca@ualberta.ca

Laura Adam, RD, MSc Candidate
University of Alberta, Department of Agricultural, Food and Nutritional Science
Phone: 780-492-8157
Email: ladam@ualberta.ca

Background

Your health and lifestyle behaviours during pregnancy are important for the long-term health of your baby and you. Improving the health of a mother during pregnancy can lead to the best health outcomes for mother and child.

Why am I being asked to take part in this research study?

You are being asked to participate in this study because you are a pregnant woman that lives in the Edmonton area.

What is the reason for doing the study?

As healthcare providers, we try to support all women to have a healthy pregnancy. We want to find out if additional lifestyle support in pregnancy can help more women live healthier lifestyles and have healthier babies. This will be in addition to your routine prenatal care. After this research is complete, we hope to better understand what supports and resources can help more women in Alberta have a healthy pregnancy. This information will also help healthcare providers improve the way women are cared for during pregnancy.

What will I be asked to do?

You will attend study visits at the University of Alberta to meet with a Registered Dietitian, the study healthcare provider. The study visits will be one-to-one sessions. Together with the study healthcare provider, you will complete lifestyle questionnaires about your health before you became pregnant and your health during your pregnancy. You may also be chosen at random to have additional support to explore how to have a healthy pregnancy. Later in pregnancy, some questionnaires will be sent to you through email so you can fill them out from home or work.

Your involvement in the study would look like the following schedule:

Before 24 weeks gestation: We will arrange for you to come to the University of Alberta Clinical Research Unit (CRU) where you will meet with the study healthcare provider (the Registered Dietitian) and complete some questionnaires on a computer or tablet. Questions will be asked about your age, education, medical history, diet and lifestyle. Additionally, the study healthcare provider will measure your height and weight. This visit will take about 1.5-2 hours.

At 26 weeks: Your study healthcare provider will phone you to check in with you and schedule your next visit. You will also be reminded to complete an online questionnaire that asks you to record everything you ate in a 24-hour period.

Week 27-30: You will come to the University of Alberta, Clinical Research Unit and meet with your study healthcare provider. You will complete a lifestyle questionnaire and have your height and weight measured. This visit will take about 1 hour.

At 34 weeks: Your study healthcare provider will phone you to check in with you and remind you to complete an online lifestyle questionnaire and a questionnaire that asks you to record everything you ate in a 24-hour period.

Approximately 1 month after birth: You will be emailed a link to a brief online questionnaire that will ask you about the total amount of weight you gained in pregnancy and feedback about the care you received during pregnancy. You will also have the chance to tell us what you thought about the study through participation in a focus group. However, this participation is optional.

A random sample of visits and phone calls will be audio-recorded. The purpose of these recordings will be to examine the discussion styles of the study healthcare providers. Consent to have your visit recorded is optional.

After your participation is complete, a research team member will go back to record data from your prenatal charts; this will include measurements from your routine prenatal visits and details from delivery (e.g. type of birth, duration of labor). The research member will also access the records of you newborn to record gender, gestational age at birth, weight and APGAR score (a physical evaluation score). This will be completely confidential and all data will be recorded under your study identification number.

You will attend your routine prenatal care appointments with your family physician/OB GYN/midwife etc. throughout pregnancy. You will be offered a postpartum nutrition session with a Registered Dietitian as an appreciation for your time to complete the study.

What are the risks and discomforts?

The risks of participating in this study are minimal. The study visits involve no invasive tests and are not expected to increase any risks in pregnancy. It is not possible to know all of the risks that may happen in a study, but the researchers have taken all reasonable safeguards to minimize any known risks to a study participant.

If you develop any complications during pregnancy, you are to contact your clinical care provider (family physician, obstetrician, OB/GYN etc.) first. Then, you are asked to notify Laura Adam (780-492-8157), the study coordinator. Our study physician, Dr. Donna Manca will review your file and evaluate if it is safe for you to continue with this study.

What are the benefits to me?

This study may or may not have any direct benefits for you. All participants will receive a general prenatal resource package after enrolling in the study. Depending on the group you are in, some of you will be offered extra support during pregnancy. After the study is complete, all women will be offered a free individualized postpartum nutrition visit with a Registered Dietitian in appreciation for completing the study. This will be done approximately 2-3 months after you give birth. This visit is optional; however, it may be of benefit in terms of healthy eating for your and your family.

Do I have to take part in the study?

Your participation is voluntary. You are free to refuse to answer any question(s) (from the questionnaires or focus group) and you can withdraw from the study at any time. This decision will not affect your routine prenatal care. If you wish to withdraw from the study, please tell one of the researchers as soon as possible. We will remove any information collected from you upon your request. For those taking part in the focus group, please be aware that because this is a group discussion, we may not be able to remove all of your comments. There is no penalty for not participating, or for withdrawing from the study.

Will I be paid if I take part in the study?

You will be reimbursed for your parking or for the cost of your transportation to participate in the study, up to a maximum of $15 per study visit, and/or for any child care costs you may incur as a result of participating in this study, up to a maximum of $30 per study visit.

Will my information be kept private?

All of the information that you provide will be held **strictly confidential**. However, for the focus group, we cannot guarantee that others from the group will maintain the confidentiality of what was said. Each participant will receive a study identification number (study ID) that will not identify you by name or initials. All information collected will be recorded under this study ID. All personal information and study data will be password protected and only available to members of the research team. Data from surveys will be stored electronically using the secure REDCap online system located at the Faculty of Medicine and Dentistry, University of Alberta, and on encrypted memory sticks that are kept in locked offices at the University of Alberta. Information collected from focus groups will stored electronically on encrypted memory sticks and kept in locked offices at the University of Alberta. Only the research staff will have access to your responses. You will NOT be personally identified in any publications or presentations that may arise from this study.

During this research study, we will need to look at your personal delivery records and your infant's birth records. We will obtain your Alberta Healthcare Number for this. This number will be recorded on a password-protected document that will only be available to members of the research team. All data obtained from your medical chart review will be associated with your study ID (it will **not** be associated with you or your infant's name). We will only obtain information that is needed for the study.

By signing this consent form you are saying it is okay for the study team to collect, use and disclose information about you from your personal health records as described above.

The data will be kept for 5 years, after which it will be destroyed.

What if I have questions?

If you have any questions or concerns, please contact Laura Adam at 780-492-8157 or behip@ualberta.ca, or any of the other study investigators.

If you have any concerns about any part of the study, please contact the University of Alberta Research Ethics Office at 780-492-2615.

Consent Form

Be Healthy in Pregnancy Study

Investigators:

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University of Alberta, Department of Agricultural, Food and Nutritional Science
Phone: 780-492-7742
Email: bellr@ualberta.ca

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Phone: 780-492-8102
Email: dpmanca@ualberta.ca

Laura Adam, RD, MSc Candidate
University of Alberta, Department of Agricultural, Food and Nutritional Science
Phone: 780-492-8157
Email: ladam@ualberta.ca

Please circle your answers:

Do you understand that you have been asked to be in a research study?	Yes	No
Have you read and receive a copy of the Information Sheet?	Yes	No
Do you understand the benefits and risks involved in taking part in this study?	Yes	No
Have you had a chance to ask questions and discuss this study?	Yes	No
Do you understand that you are free to leave the study at any time without having to give a reason and without affecting your medical care?	Yes	No
Has the issue of confidentiality been explained to you?	Yes	No
Do you understand that you are granting approval to the research team to access you and your baby's Alberta health records after delivery (solely for data collection purposes)?	Yes	No
Do you understand who will have access to your study records, including personally identifiable health information?	Yes	No
Do you understand that you may randomly be assigned to the group without additional support?	Yes	No

Optional Consent/Not required for study eligibility:

Are you okay with the possibility of having your sessions with the study healthcare provider audio-recorded? This will be chosen at random.	Yes	No

This study was explained to me by: _____

I, _____, agree to take part in this study.
Participant Name (Printed)

_____ _____
Participant Signature Date

_____ _____
Signature of Investigator or Designee Date

THE INFORMATION SHEET MUST BE ATTACHED TO THIS CONSENT FORM AND A COPY GIVEN TO THE RESEARCH PARTICIPANT.

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Name of Study Member Screening:_____
Date: _____
Screening ID#: _____
☐Eligible, scheduled - Study ID#:_____
☐Eligible, refused ☐Ineligible

Screening Form

Initial Screening

___ In Person. Which clinic or site? _____
___ Telephone
___ Other
Note: How did they hear about this study? _____

Eligibility

All of the following criteria must be met:

- ☐ ≥ 8 weeks, ≤ 20 weeks gestation Gestational Age: _____ weeks
- ☐ ≥ 20 years of age
- ☐ Singleton pregnancy
- ☐ Can read and speak English
- ☐ Has Internet and telephone access
- ☐ Can make the Baseline visit by ≤ 24 weeks gestation
- ☐ Willingness to provide self-reported pre-pregnancy weight and height

  Height: _____ feet _____ inches OR _____ m

  Pre-pregnancy Weight: _____lbs OR _____ kg

  BMI = _____ kg/m²
- ☐ Willingness to provide Alberta Healthcare Number (PHN)

Exclusion Criteria

Participant ineligible for any of the following:

- ☐ Smoker
- ☐ Current eating disorder
- ☐ Complete/total placenta previa
- ☐ Hypothyroidism (low thyroid function)
- ☐ Hyperthyroidism (overactive thyroid)
- ☐ Type I, Type II, Gestational Diabetes
- ☐ Incompetent cervix (in previous pregnancy or present diagnosis)
- ☐ Pregnancy-Induced Hypertension (PIH) with adverse features (ie: edema)
- ☐ Medical professional has stated physical activity is not safe for this individual during pregnancy
- ☐ Currently receiving counselling from a Registered Dietitian
- ☐ Currently participating in another lifestyle program
- ☐ Receiving prenatal care from a Midwife

Note:
1 kg = 2.204 lbs
1 foot= 12 inches
1 inch= 2.54 cm

Screening Form

Name of Study Member Screening:_____
Date: _____
Screening ID#: _____
☐Eligible, scheduled - Study ID#:_____
☐Eligible, refused ☐Ineligible

Need for further Assessment

☐ Other current medical conditions that may affect weight in pregnancy? Consult with the Study Physician regarding inclusion/exclusion. Please complete electronic Screening Follow-Up Form- choose "Consult Family Physician" as reason to follow-up.

_____

_____

Is this person eligible for the BeHIP Study?

☐ **Yes**

- ☐ Study ID# determined and baseline visit scheduled
- ☐ Still deciding; Please provide follow-up phone call (Complete electronic Screening Follow-up Records: Google Sheet)
- ☐ Still deciding; Will contact us
- ☐ Refused, Unknown reason
- ☐ Refused, Issue with study protocol
- ☐ Refused, Not interested
- ☐ Refused, Busy
- ☐ Refused, Other: _____

☐ **No**

☐ **Not sure,** need further consult with the study Family Physician. Will need contact information to confirm eligibility. Complete Google Sheet: *Screening Follow-up Records*. Choose "Consult with Family Physician" option.

Note:
1 kg = 2.204 lbs
1 foot= 12 inches
1 inch= 2.54 cm

Initial Questionnaire

Please complete the survey below.

Thank you!

- Be Healthy in Pregnancy (BeHIP) study team

General Background: These questions are general questions about you. Your answers are confidential.

What is your birth date?

_____

Were you born in Canada?

- ◯ Yes
- ◯ No

How long have you lived in Canada?

- ◯ Less than 1 year
- ◯ 1-3 years
- ◯ 4-5 years
- ◯ greater than 5 years

How would you describe your ethnic origin (race)?

- ◯ Arab
- ◯ Black (African, American, North American)
- ◯ Caucasian/white (e.g. English, French, German, Greek, Irish, Polish, Russian, Scottish, Ukrainian)
- ◯ Chinese
- ◯ Filipino
- ◯ Japanese
- ◯ Korean
- ◯ Latin American
- ◯ Native/Aboriginal Peoples of North America (First Nations, North American Indian, Metis, Inuit)
- ◯ South Asian
- ◯ South East Asian
- ◯ West Asian
- ◯ Other

If other, please specify how you would describe your ethnic origin (race):

_____

Please select any medical conditions you currently have (check all that apply).

- ☐ Not applicable (I have no medical conditions)
- ☐ Anemia
- ☐ Anxiety
- ☐ Asthma
- ☐ Celiac
- ☐ Depression
- ☐ Diabetes: Type 1 (insulin dependent)
- ☐ Diabetes: Type 2 (non-insulin dependent)
- ☐ Diabetes: Gestational
- ☐ Epilepsy (seizures)
- ☐ Heart disease
- ☐ Primary/chronic hypertension (high blood pressure before pregnancy)
- ☐ Gestational hypertension (high blood pressure that developed about half way through your pregnancy)
- ☐ Pre-eclampsia (high blood pressure caused by symptoms like protein in urine and possibly changes in blood and the liver)
- ☐ Inflammatory bowel disease: Ulcertative colitis
- ☐ Inflammatory bowel disease or Chron's disease
- ☐ Irritable bowel syndrome
- ☐ Polycystic Ovary Syndrome (PCOS)
- ☐ Other

You have chosen "Other". Please specify the other medical condition(s) you may have that are not included on this list.

_____

What is the highest level of education that you have completed?

- ◯ Less than high school diploma
- ◯ Completed high school diploma
- ◯ Completed trade, technical, or vocational school or business/community college (e.g.. SAIT, NAIT)
- ◯ Completed university undergraduate degree
- ◯ Completed post-graduate degree

What is your marital status? At present are you:

- ◯ Single (never married)
- ◯ Married
- ◯ Common-law/living with partner/living as married
- ◯ Divorced
- ◯ Widowed
- ◯ Separated

What is the total income, before taxes and deductions, of all the household members from all sources in the past 12 months? (Your best guess is okay.)

- ◯ Less than $20,000
- ◯ $20,000-$39,000
- ◯ $40,000-$69,999
- ◯ $70,000-$99,999
- ◯ $100,000 or more

What is your main occupation (i.e. your work)? Please be specific. For example: student, homemaker, farmer, high school teacher, legal secretary, self-employed accountant.

_____

Is this occupation full time or part time?

- ◯ Full Time (35 hours or greater/week)
- ◯ Part Time (less than 35 hrs/week)

Have you ever been pregnant before?

- ◯ Yes
- ◯ No

How many biological children do you have (not including this pregnancy)?

◯ 1 ◯ 2 ◯ 3 ◯ 4
◯ 5 ◯ 6 ◯ 7 or more
◯ No live births

How many children (under the age of 18) live in your household (not including this pregnancy)?

◯ 1 ◯ 2 ◯ 3 ◯ 4
◯ 5 ◯ 6 ◯ 7 or more
◯ No children under 18 live in our household

How many months were you NOT pregnant between your youngest child's date of birth and the start of your current pregnancy?

◯ Between 1-4 months
◯ Between 5-8 months
◯ Between 9-12 months (1 year)
◯ Between 13-16 months
◯ Between 17-20 months
◯ Between 20-23 months
◯ Between 24-27 months (2 years)
◯ Between 28-31 months
◯ Between 32-35 months
◯ Between 36-39 months (3 years)
◯ Between 40-43 months
◯ Between 44-47 months
◯ 4 years or more
(Remember: There are 12 months in 1 year.)

Baseline Lifestyle Questionnaire

Please complete the survey below.

Thank you!

- Be Healthy in Pregnancy (BeHIP) Study team

To read to the participant:

"This questionnaire is a lifestyle questionnaire that asks questions about the foods you eat, your daily activities, the support of others around you and your overall health now during pregnancy, and prior to becoming pregnant. The purpose of this study is to understand if additional support during pregnancy can assist women to achieve healthy lifestyles during pregnancy.

I will be going through the questionnaire with you, and filling in your answers on this tablet. We have response cards here for you to flip through as we go through the questionnaire. Throughout the questionnaire, feel free to ask questions at any point. We are here to help you too."

"Do you have any questions before we start?"

Part A: Dietary IntakeThe following questions below ask you about your eating habits in general during the past 7 days. It is attempting to get an overall picture of what you eat, while the 24 hour food recalls will get a more exact picture. Please Circle the best answer.If you were sick during the past 7 days, please think back to the last 7 days that you were not sick.

1 How many of the last SEVEN DAYS have you followed Eating Well with Canada's Food Guide with appropriate serving sizes?

◯ 0 days ◯ 1 days ◯ 2 days ◯ 3 days ◯ 4 days ◯ 5 days ◯ 6 days ◯ 7 days

On average, over the past MONTH, how many WEEKS have you followed Eating Well with Canada's Food Guide with appropriate serving sizes?

◯ 0 weeks ◯ 1 week ◯ 2 weeks ◯ 3 weeks ◯ 4 weeks

On how many of the last SEVEN DAYS did you eat foods high in sugar, such as cakes, cookies, desserts, candies, etc.?

◯ 0 days ◯ 1 days ◯ 2 days ◯ 3 days ◯ 4 days ◯ 5 days ◯ 6 days ◯ 7 days

On how many of the last SEVEN DAYS did you eat foods high in fibre such as oatmeal, high fibre cereals, whole grain breads?

○ 0 days ○ 1 days ○ 2 days ○ 3 days ○ 4 days ○ 5 days ○ 6 days ○ 7 days

On how many of the last SEVEN DAYS did you eat fish or other foods high in omega-3 fats (such as walnuts, flax seeds, omega-3 fortified eggs, omega-3 fortified orange juice)?

○ 0 days ○ 1 days ○ 2 days ○ 3 days ○ 4 days ○ 5 days ○ 6 days ○ 7 days

On how many of the last SEVEN DAYS did you eat food which contained or was prepared with canola, walnut, olive, or flax oils?

○ 0 days ○ 1 days ○ 2 days ○ 3 days ○ 4 days ○ 5 days ○ 6 days ○ 7 days

On how many of the last SEVEN DAYS did you eat food that is high in folic acid, such as green leafy vegetables, edamame beans, lentils, chickpeas, beans, liver?

○ 0 days ○ 1 days ○ 2 days ○ 3 days ○ 4 days ○ 5 days ○ 6 days ○ 7 days

On how many of the last SEVEN DAYS did you eat foods high in fat, such as high fat dairy products, fatty meat, fried foods or deep fried foods?

Note: High fat dairy products are as follows: homo milk, half & half cream, coffee cream, creamers, ice cream, whipped cream, greater than 3% milk fat yogurt and full fat cheese.

○ 0 days ○ 1 days ○ 2 days ○ 3 days ○ 4 days ○ 5 days ○ 6 days ○ 7 days

On how many of the last SEVEN DAYS did you drink any alcohol?

○ 0 days ○ 1 days ○ 2 days ○ 3 days ○ 4 days ○ 5 days ○ 6 days ○ 7 days

On how many of the last SEVEN DAYS did you eat at and/or take out food from a fast food establishment?

○ 0 days ○ 1 days ○ 2 days ○ 3 days ○ 4 days ○ 5 days ○ 6 days ○ 7 days

Since becoming pregnant, have you changed your intake of FRUIT?

○ No change
○ Yes, my intake increased
○ Yes, my intake decreased
○ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of FRUIT in your diet.

☐ (a)Cravings
☐ (b)Tastes good
☐ (c)Because they are healthy foods
☐ (d)Because they are affordable foods
☐ (e)Because that is what I could tolerate
☐ (f)Because I know I should eat more of these foods
☐ (g)Because I no longer have to restrict myself with what I eat
☐ (h)I was told to eat these foods by a friend or family member
☐ (i)I was told to eat these foods by one of my healthcare providers
☐ Other

Please select the reason(s) you have decreased your intake of FRUIT in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated FRUIT in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f)Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of VEGETABLES?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of VEGETABLES in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of VEGETABLES in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated VEGETABLES in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f) Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of GRAIN PRODUCTS (i.e. breads, cereals, rice, crackers, pitas)?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of GRAIN PRODUCTS in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of GRAIN PRODUCTS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated GRAIN PRODUCTS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f) Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of HIGH FIBRE FOODS (i.e. oatmeal, whole grain bread, bran cereal)?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of HIGH FIBRE FOODS in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of HIGH FIBRE FOODS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated HIGH FIBRE FOODS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f) Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of PASTEURIZED CHEESE?

- ○ No change
- ○ Yes, my intake increased
- ○ Yes, my intake decreased
- ○ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of PASTEURIZED CHEESE in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of PASTEURIZED CHEESE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated PASTEURIZED CHEESE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f) Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of UNPASTEURIZED CHEESE?

Note: Unpasteurized cheeses include: feta, brie, camembert, blue veined (e.g. Roquefort), queso fresco and queso blanco. Unless it is stated on the label of those cheeses as "pasteurized".

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of UNPASTEURIZED CHEESE in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of UNPASTEURIZED CHEESE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated UNPASTEURIZED CHEESE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f) Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of YOGURT?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of YOGURT in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of YOGURT in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated YOGURT in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f) Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of DELI MEATS?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of DELI MEATS in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of DELI MEATS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated DELI MEATS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f) Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of COOKED FISH/SHELLFISH?

- ○ No change
- ○ Yes, my intake increased
- ○ Yes, my intake decreased
- ○ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of COOKED FISH/SHELLFISH in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of COOKED FISH/SHELLFISH in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated COOKED FISH/SHELLFISH in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f) Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of RAW FISH/SHELLFISH?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of RAW FISH/SHELLFISH in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of RAW FISH/SHELLFISH in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated RAW FISH/SHELLFISH in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f) Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of MEAT?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of MEAT in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of MEAT in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated MEAT in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f) Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of NUTS?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of NUTS in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of NUTS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated NUTS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f) Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of COOKED EGGS?

- ○ No change
- ○ Yes, my intake increased
- ○ Yes, my intake decreased
- ○ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of COOKED EGGS in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of COOKED EGGS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated COOKED EGGS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f) Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of SPICY FOODS?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of SPICY FOODS in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of SPICY FOODS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated SPICY FOODS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f) Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of SALTY FOODS?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of SALTY FOODS in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of SALTY FOODS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated SALTY FOODS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f) Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of SWEET FOODS?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of SWEET FOODS in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of SWEET FOODS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated SWEET FOODS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f) Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of CAFFEINATED COFFEE?

- ○ No change
- ○ Yes, my intake increased
- ○ Yes, my intake decreased
- ○ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of CAFFEINATED COFFEE in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because I am thirsty
- ☐ (d)Because it is a healthy drink
- ☐ (e)Because it is an affordable drink
- ☐ (f)Because that is what I could tolerate
- ☐ (g)Because I know I should drink more of this
- ☐ (h)Because I no longer have to restrict myself with what I drink
- ☐ (i)I was told to drink this by a friend or family member
- ☐ (j)I was told to drink this by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of CAFFEINATED COFFEE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Because it is expensive
- ☐ (g)Because it is an unhealthy drink
- ☐ (h)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated CAFFEINATED COFFEE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Unsafe to drink during pregnancy
- ☐ (g)Because it is expensive
- ☐ (h)Because it is an unhealthy drink
- ☐ (i)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ (j)I was told to avoid this drink by a friend or family member
- ☐ (k)I was told to avoid this drink by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of DECAFFEINATED COFFEE?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of DECAFFEINATED COFFEE in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because I am thirsty
- ☐ (d)Because it is a healthy drink
- ☐ (e)Because it is an affordable drink
- ☐ (f)Because that is what I could tolerate
- ☐ (g)Because I know I should drink more of this
- ☐ (h)Because I no longer have to restrict myself with what I drink
- ☐ (i)I was told to drink this by a friend or family member
- ☐ (j)I was told to drink this by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of DECAFFEINATED COFFEE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Because it is expensive
- ☐ (g)Because it is an unhealthy drink
- ☐ (h)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated DECAFFEINATED COFFEE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Unsafe to drink during pregnancy
- ☐ (g)Because it is expensive
- ☐ (h)Because it is an unhealthy drink
- ☐ (i)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ (j)I was told to avoid this drink by a friend or family member
- ☐ (k)I was told to avoid this drink by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of CAFFEINATED TEA?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of CAFFEINATED TEA in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because I am thirsty
- ☐ (d)Because it is a healthy drink
- ☐ (e)Because it is an affordable drink
- ☐ (f)Because that is what I could tolerate
- ☐ (g)Because I know I should drink more of this
- ☐ (h)Because I no longer have to restrict myself with what I drink
- ☐ (i)I was told to drink this by a friend or family member
- ☐ (j)I was told to drink this by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of CAFFEINATED TEA in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Because it is expensive
- ☐ (g)Because it is an unhealthy drink
- ☐ (h)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated CAFFEINATED TEA in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Unsafe to drink during pregnancy
- ☐ (g)Because it is expensive
- ☐ (h)Because it is an unhealthy drink
- ☐ (i)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ (j)I was told to avoid this drink by a friend or family member
- ☐ (k)I was told to avoid this drink by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of DECAFFEINATED TEA?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of DECAFFEINATED TEA in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because I am thirsty
- ☐ (d)Because it is a healthy drink
- ☐ (e)Because it is an affordable drink
- ☐ (f)Because that is what I could tolerate
- ☐ (g)Because I know I should drink more of this
- ☐ (h)Because I no longer have to restrict myself with what I drink
- ☐ (i)I was told to drink this by a friend or family member
- ☐ (j)I was told to drink this by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of DECAFFEINATED TEA in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Because it is expensive
- ☐ (g)Because it is an unhealthy drink
- ☐ (h)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated DECAFFEINATED TEA in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Unsafe to drink during pregnancy
- ☐ (g)Because it is expensive
- ☐ (h)Because it is an unhealthy drink
- ☐ (i)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ (j)I was told to avoid this drink by a friend or family member
- ☐ (k)I was told to avoid this drink by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of JUICE?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of JUICE in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because I am thirsty
- ☐ (d)Because it is a healthy drink
- ☐ (e)Because it is an affordable drink
- ☐ (f)Because that is what I could tolerate
- ☐ (g)Because I know I should drink more of this
- ☐ (h)Because I no longer have to restrict myself with what I drink
- ☐ (i)I was told to drink this by a friend or family member
- ☐ (j)I was told to drink this by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of JUICE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Because it is expensive
- ☐ (g)Because it is an unhealthy drink
- ☐ (h)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated JUICE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Unsafe to drink during pregnancy
- ☐ (g)Because it is expensive
- ☐ (h)Because it is an unhealthy drink
- ☐ (i)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ (j)I was told to avoid this drink by a friend or family member
- ☐ (k)I was told to avoid this drink by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of POP?

- ○ No change
- ○ Yes, my intake increased
- ○ Yes, my intake decreased
- ○ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of POP in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because I am thirsty
- ☐ (d)Because it is a healthy drink
- ☐ (e)Because it is an affordable drink
- ☐ (f)Because that is what I could tolerate
- ☐ (g)Because I know I should drink more of this
- ☐ (h)Because I no longer have to restrict myself with what I drink
- ☐ (i)I was told to drink this by a friend or family member
- ☐ (j)I was told to drink this by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of POP in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Because it is expensive
- ☐ (g)Because it is an unhealthy drink
- ☐ (h)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated POP in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Unsafe to drink during pregnancy
- ☐ (g)Because it is expensive
- ☐ (h)Because it is an unhealthy drink
- ☐ (i)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ (j)I was told to avoid this drink by a friend or family member
- ☐ (k)I was told to avoid this drink by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of MILK?

- ○ No change
- ○ Yes, my intake increased
- ○ Yes, my intake decreased
- ○ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of MILK in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because I am thirsty
- ☐ (d)Because it is a healthy drink
- ☐ (e)Because it is an affordable drink
- ☐ (f)Because that is what I could tolerate
- ☐ (g)Because I know I should drink more of this
- ☐ (h)Because I no longer have to restrict myself with what I drink
- ☐ (i)I was told to drink this by a friend or family member
- ☐ (j)I was told to drink this by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of MILK in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Because it is expensive
- ☐ (g)Because it is an unhealthy drink
- ☐ (h)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated MILK in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Unsafe to drink during pregnancy
- ☐ (g)Because it is expensive
- ☐ (h)Because it is an unhealthy drink
- ☐ (i)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ (j)I was told to avoid this drink by a friend or family member
- ☐ (k)I was told to avoid this drink by one of my healthcare providers
- ☐ Other

Since becoming pregnant, have you changed your intake of WATER?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of WATER in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because I am thirsty
- ☐ (d)Because it is a healthy drink
- ☐ (e)Because it is an affordable drink
- ☐ (f)Because that is what I could tolerate
- ☐ (g)Because I know I should drink more of this
- ☐ (h)Because I no longer have to restrict myself with what I drink
- ☐ (i)I was told to drink this by a friend or family member
- ☐ (j)I was told to drink this by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of WATER in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Because it is expensive
- ☐ (g)Because it is an unhealthy drink
- ☐ (h)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated WATER in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Unsafe to drink during pregnancy
- ☐ (g)Because it is expensive
- ☐ (h)Because it is an unhealthy drink
- ☐ (i)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ (j)I was told to avoid this drink by a friend or family member
- ☐ (k)I was told to avoid this drink by one of my healthcare providers
- ☐ Other

Have you been taking any vitamins/minerals during this pregnancy?

- ◯ Yes
- ◯ No

What are you currently taking?

	Not applicable	Less than once a week	1-3 days a week	4-5 days a week	6 days a week	7 days a week
Prenatal vitamin (Materna, NoName brands)	☐	☐	☐	☐	☐	☐
Iron	☐	☐	☐	☐	☐	☐
Folic Acid	☐	☐	☐	☐	☐	☐
Omega 3	☐	☐	☐	☐	☐	☐
Calcium	☐	☐	☐	☐	☐	☐
Vitamin D	☐	☐	☐	☐	☐	☐
Multivitamin (regular)	☐	☐	☐	☐	☐	☐
Women's multivitamin	☐	☐	☐	☐	☐	☐

Who is the person that does most of the cooking in your household?

- ◯ I do most of the cooking
- ◯ My husband/partner does most of the cooking
- ◯ My husband/partner and I share the cooking duties equally
- ◯ Another family member does most of the cooking
- ◯ We don't cook very often
- ◯ Other

Please specify who does most of the cooking in your household. _____

When choosing a new product in the grocery store, do you read the nutrition label before you make a decision to purchase it?

- ◯ Yes, I always read the nutrition label
- ◯ Yes, I sometimes read the nutrition label
- ◯ No, I do not read the nutrition label

How confident do you feel in your ability to cook?

- ◯ Very confident
- ◯ Confident
- ◯ Somewhat confident
- ◯ Not confident

How do you feel your cooking skills compare to other people your age?

- ◯ Better
- ◯ Worse
- ◯ About the same
- ◯ I am not sure

On this scale, where do you feel your knowledge level is regarding healthy eating?

◯ Poor ◯ Less than Average ◯ Average ◯ Above Average ◯ Strong/Excellent

On this scale, where do you feel your knowledge level is regarding healthy eating during pregnancy?

◯ Poor ◯ Less than Average ◯ Average ◯ Above Average ◯ Strong/Excellent

If you wanted to learn more about healthy eating/food choices in pregnancy, where would you go to first? Second?

	1st choice	2nd choice
Books	○	○
Doctors	○	○
Friends/family	○	○
Google search	○	○
Magazines	○	○
Mobile App	○	○
Registered Dietitian	○	○
One of the following websites: Health Canada; Alberta Health Services; Healthy Parents Healthy Children; or MotherRisk	○	○
Television	○	○
Other	○	○

Which mobile app do you use for healthy eating/food choices in pregnancy? _____

If other, where do you go to learn more about healthy eating/food choices in pregnancy. _____

During pregnancy, is it clear to you:

	Yes	No
How much food is necessary to eat?	○	○
What a healthy snack should be?	○	○
What kind of foods to avoid?	○	○
How much caffeine is safe to consume?	○	○
How much alcohol is safe to drink?	○	○
What supplements are recommended?	○	○
How much weight you should gain?	○	○
How much exercise is safe?	○	○
Where you can go for credible medical advice?	○	○

When people try to make healthy lifestyle choices, the people around them can sometimes help or sometimes make things harder, even if they don't realize it. Please check the boxes below which best indicate how helpful these people are, or you think they would be, if you tried to make a healthy lifestyle change.

	Not at all helpful	A little helpful	Usually helpful	Always helpful	Not applicable
Husband/spouse/partner	○	○	○	○	○
Children	○	○	○	○	○
Other relatives	○	○	○	○	○
Friends	○	○	○	○	○
Co-workers	○	○	○	○	○
Healthcare providers (eg. physicians, nurses, midwives)	○	○	○	○	○

Please circle the number that applies to how you felt about being in control of your weight prior to pregnancy.

	1- Strongly Agree	2- Agree	3- Neither Agree nor Disagree	4- Disagree	5- Strongly Disagree
Prior to pregnancy, I felt in control of my weight.	○	○	○	○	○
If I eat right, and get enough exercise and rest, I can control my weight the way I want.	○	○	○	○	○
Being the right weight is mainly good luck.	○	○	○	○	○

How sure are you that during pregnancy, you can:

	1- Very Sure	2	3- Neutral	4	5- Very Unsure
Eat balanced meals	○	○	○	○	○
Eat foods that are good for you and avoid foods that are not	○	○	○	○	○
Eat foods that are good for you even when family or social life takes a lot of your time	○	○	○	○	○
Get regular exercise	○	○	○	○	○
Get regular exercise even when family or social life takes a lot of time	○	○	○	○	○

Have you experienced nausea/vomiting during this pregnancy?

- ○ No
- ○ Yes, I have experienced morning sickness
- ○ Yes, I have experienced hyperemesis gravidarum (severe morning sickness)

Has your nausea/vomiting changed your normal eating behaviours?

- ○ Yes
- ○ No

How has your nausea/vomiting changed your normal eating behaviours? (check all that apply)

- ☐ I eat less when I am feeling sick
- ☐ I eat more when I am feeling sick
- ☐ I change the type of foods I eat when I am feeling sick

At what stage in your pregnancy has your nausea/vomiting changed your normal eating behaviours? (check all that apply)

- ☐ Weeks 0-4
- ☐ Weeks 4-12
- ☐ Weeks 12-16
- ☐ Weeks 16-20
- ☐ Weeks 20-24

Are there any other symptoms of pregnancy that have affected your eating? E.g. constipation; heart burn; other? If so, please describe.

_____

During this trimester, when you are NOT at work, how much time do you usually spend: Preparing meals (cook, set table, wash dishes):

- ○ None
- ○ Less than 1/2 hour per day
- ○ 1/2 to almost 1 hour per day
- ○ 1 to almost 2 hours per day
- ○ 2 to almost 3 hours per day
- ○ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Dressing, bathing, feeding children while you are sitting:

- ○ None
- ○ Less than 1/2 hour per day
- ○ 1/2 to almost 1 hour per day
- ○ 1 to almost 2 hours per day
- ○ 2 to almost 3 hours per day
- ○ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Dressing, bathing, feeding children while you are standing:

- ○ None
- ○ Less than 1/2 hour per day
- ○ 1/2 to almost 1 hour per day
- ○ 1 to almost 2 hours per day
- ○ 2 to almost 3 hours per day
- ○ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Playing with children while you are sitting or standing:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Playing with children while you are walking or running:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Carrying children:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Taking care of an older adult:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Sitting and using a computer or writing:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Watching TV or a video:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Sitting and reading, talking, or on the phone:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Playing with pets:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Light cleaning (Making beds, doing laundry, ironing, putting things away):

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Shopping (for food, clothes, or other items):

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Heavier cleaning (vacuum, mop, sweep, wash windows):

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, when you are NOT at work, how much time do you usually spend: Mowing lawn while on a riding mower:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, when you are NOT at work, how much time do you usually spend: Mowing lawn using a walking mower, raking, gardening, shovelling snow:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Walking slowly to go places (such as to the bus, work, visiting) * Not for fun or exercise

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, how much time do you usually spend: Walking quickly to go places (such as to the bus, work, or school): *Not for fun or exercise

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, how much time do you usually spend: Driving or riding in a car or bus:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, how much time do you usually spend: Walking slowly for fun or exercise:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Walking more quickly for fun or exercise:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Walking quickly up hills for fun or exercise:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Jogging:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Participating in a prenatal exercise class:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Swimming:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Dancing:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, do you participate in any another activities for fun or exercise? What is the name of this activity? [Leave blank if you don't have any additional activities than the ones previously listed.]

_____

During this trimester, how much time do you usually spend: Doing this activity listed above?

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, do you participate in any another activities for fun or exercise? What is the name of this activity? [Leave blank if you don't have any additional activities than the ones previously listed.]

_____

During this trimester, how much time do you usually spend: Doing this activity listed above?

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

At Work...Please fill out this section if you work for wages, as a volunteer, or if you are a student. If you are a homemaker, out of work, or unable to work, you do not need to complete this last section.

During this trimester, how much time do you usually spend: Sitting at work or in class:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, how much time do you usually spend: Standing or slowly walking at work while carrying things (heavier than a 1 gallon milk jug):

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, how much time do you usually spend: Standing or slowly walking at work not carrying anything:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, how much time do you usually spend: Walking quickly at work while carrying things (heavier than a 1 gallon milk jug):

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, how much time do you usually spend: Walking quickly at work not carrying anything:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

How would you rate your health in general prior to becoming pregnant? Would you say it was:

- ◯ Excellent
- ◯ Very good
- ◯ Good
- ◯ Fair
- ◯ Poor

How would you rate your health overall now? Would you say it is:

- ◯ Excellent
- ◯ Very good
- ◯ Good
- ◯ Fair
- ◯ Poor

Anthropometric & Study Notes-AC Group

ENRICH
Promoting Appropriate Maternal Body Weight in Pregnancy and Postpartum through Healthy Eating

UNIVERSITY OF ALBERTA

Complete the following **after** the participant has completed the study:

Anthropometric & Study Notes-AC Group

	Count	Minutes	Notes
Clinic Visits			
Phone Calls			
Email		----	
Total:			

Anthropometric & Study Notes-AC Group

Baseline Visit	Date: Who is in attendance?	Start Time: End Time: Total mins:

Anthropometrics

Measurement	Readings				Comments
	1st	2nd	(3rd)	Avg.	
Height (cm)					
Weight (kg)					

Record weight and height with one decimal place.

Pre-pregnancy		Pre-Pregnancy BMI Category
Height (from above)		☐ Underweight (<18.5) ☐ Normal (18.5-24.9) ☐ Overweight (25.0-29.9) ☐ Obese (≥30)
Weight		
BMI		

Notes:

Signature: _____

Anthropometric & Study Notes-AC Group

26 Week Phone Follow-Up	Date: Who is in attendance?	Start Time: End Time: Total mins:

Notes:

Signature: _____

Clinic Visit 2	Date: Who is in attendance?	Start Time: End Time: Total mins:

Anthropometrics

Measurement	Readings				Comments
	1st	2nd	(3rd)	Avg.	
Weight (kg)					

Record weight with one decimal place.

Notes:

Signature: _____

Anthropometric & Study Notes-AC Group

34 Week Phone Follow-Up	Date: Who is in attendance?	Start Time: End Time: Total mins:

Notes:

Signature: _____

1 month Phone Follow-Up	Date: Who is in attendance?	Start Time: End Time: Total mins:

Notes:

Signature: _____

Anthropometric & Study Notes-INT

Anthropometric & Study Notes-INT Group

Complete the following **after** the participant has completed the study:

	Count	Minutes	Healthy Conversation Minutes	Notes
Clinic Visits				
Phone Calls				
Email		----	----	
Video Call				
Total:				

Baseline Visit	**Date:** **Who is in attendance?**	**Start Time:** **End Time:** **Total mins:**

Anthropometric & Study Notes-INT Group

Anthropometrics

Measurement	Readings				Comments
	1st	2nd	(3rd)	Avg.	
Height (cm)					
Weight (kg)					

Record weight and height with one decimal place.

Pre-pregnancy		Pre-Pregnancy BMI Category
Height (from above)		☐ Underweight (<18.5) ☐ Normal (18.5-24.9) ☐ Overweight (25.0-29.9) ☐ Obese (≥30)
Weight		
BMI		

☐ **ASK:** *(Possible Healthy Conversation prompt questions surrounding weight gain.)*

- How important is the amount of weight you gain in pregnancy?
  - ☐ Important, because _____
  - ☐ Not Important, because _____
  - ☐ Other response: _____
- Is this something you would like to discuss further today?
- What do you feel is an appropriate amount of weight to gain in pregnancy?
- How much weight do you think is ideal for a healthy pregnancy?

Notes:

Signature: _____

26 Week Phone Follow-Up

Date: **Start Time:**

Who is in attendance? **End Time:** _____

Total mins:

Anthropometric & Study Notes-INT Group

Notes:

Signature: _____

Clinic Visit 2	**Date:** **Who is in attendance?**	**Start Time:** **End Time:** _____ **Total mins:**

Anthropometrics

Measurement	Readings				Comments
	1st	2nd	(3rd)	Avg.	
Weight (kg)					

Record weight and height with one decimal place.

☐ **ASK:** *(Possible Healthy Conversation prompt questions surrounding weight gain.)*

- What are your thoughts on your weight gain in your pregnancy thus far?
- How do you feel your weight gain fits within your target weight gain?
- What has worked for you to monitor your progress towards your goal?

Notes:

34 Week Phone Follow-Up	**Date:** **Who is in attendance?**	**Start Time:** **End Time:** _____ **Total mins:**

Signature: _____

Notes:

Anthropometric & Study Notes-INT Group

1 month Phone Follow-Up	Date: Who is in attendance?	Start Time: End Time: Total mins:

Notes:

Signature: _____

Additional Follow-Up Records

(Additional follow-up applicable for BeHIP+ only)

Date	Mode	Start Time	End Time	Total mins	HC mins	Topic	Notes

Anthropometric & Study Notes-INT Group

Post-Visit Notes-INT Group

Post-Visit Notes-INT Group

Baseline Visit

Topic(s) discussed today:

- ☐ Vitamins/Minerals
- ☐ Breastfeeding
- ☐ Exercise
- ☐ Risk of excessive gestational weight
- ☐ Risk of inadequate gestational weight
- ☐ Appropriate gestational weight gain
- ☐ Nutrition/healthy eating

Comments:

Goal

S Specific *What specifically do you want to change?*
M Measurable *How much of this will you do? How often will you do it?*
A Action-orientated *What will you do to make that change happen?*
R Realistic *What needs to happen to allow you to do this? How confident are you that you can do this? How important is the change for you? What is likely going to stop you from doing this? What can you do to get over the barriers to change?*
T Timed *By when will you have this done?*
E Evaluated *When will you reflect on your progress? How will you know when you've achieved your goal? How will you feel?*
R Reviewed *How will you review what to do next? With whom can you discuss this?*

Post-Visit Notes-INT Group

What are their overall goals?

Self-monitoring technique:

To follow-up at next discussion:

1. Did the woman want to talk about weight?
   ☐ Yes ☐ No ☐ N/A
   Expand:

2. At what point did the Healthy Conversations arise? Specify the question number(s) where Healthy Conversations started.

3. How many minutes did you use HCS? _____ (total minutes)

4. Who did most of the talking?
   a. I did
   b. Participant and I talked about the same amount
   c. Participant

5. How much time did you spend asking open discovery questions? (What/How)
   a. Less than half of the time
   b. Half of the time
   c. Most of the time

Post-Visit Notes-INT Group

6. Check off the topics you discussed at this visit. In the notes section, expand as needed.

5As Checklist

Name: _____

Date: __/__/____

Provider: _____

Remember to focus on health and healthy behaviours and not the number on the scale.
This checklist should be used with the 5A's of Healthy Pregnancy Weight Gain™ Booklet.

ASK

- ☐ Ask for permission to discuss weight
- ☐ Be non-judgmentally curious
- ☐ Ask questions before making statements
- ☐ Explore readiness for change

ASSESS

- ☐ Pre-pregnancy BMI
- ☐ Weight at every prenatal visit
- ☐ Potential "root causes" of guideline-discordant weight gain (4Ms: Mental, Mechanical, Metabolic, Milieu)
- ☐ Consider pregnancy-related health beliefs

ADVISE

- ☐ Advise on pregnancy weight gain risk
- ☐ Discuss the need for a strategy throughout pregnancy and the postpartum period
- ☐ Explain benefits of gaining within the guidelines
- ☐ Management options
  - ○ Weight gain
  - ○ Sleep, time and stress
  - ○ Eating behaviours
  - ○ Physical activity
  - ○ Sedentary behaviour
  - ○ Mental health

AGREE

- ☐ Agree on a realistic SMART plan to achieve health behaviour outcomes
- ☐ Agree on sustainable behavioural goals
- ☐ Behavioural goals should be SMART
- ☐ Agree on the plan

ASSIST

- ☐ Assist women in identifying barriers and facilitators, educate, refer and arrange follow-up

Notes:

Canadian Obesity Network

Post-Visit Notes-INT Group

Phone Follow-Up 1

Topic(s) discussed today:

- ☐ Vitamins/Minerals
- ☐ Breastfeeding
- ☐ Exercise
- ☐ Risk of excessive gestational weight
- ☐ Risk of inadequate gestational weight
- ☐ Appropriate gestational weight gain
- ☐ Nutrition/healthy eating

Progression towards goal(s) previously set:

Self-monitoring? Yes No

Supports:

Barriers:

Was a new goal discussed? Yes No

S Specific
M Measurable
A Action-orientated
R Realistic

Post-Visit Notes-INT Group

T Timed
E Evaluated
R Reviewed

Current goals?

Self-monitoring technique:

To follow-up at next discussion:

1. How many minutes did you use HCS? _____ (total minutes)

2. Who did most of the talking?
    a. I did
    b. Participant and I talked about the same amount
    c. Participant

3. How much time did you spend asking open discovery questions? (What/How)
    a. Less than half of the time
    b. Half of the time
    c. Most of the time

Post-Visit Notes-INT Group

Study Visit 2

Topic(s) discussed today:

- ☐ Vitamins/Minerals
- ☐ Breastfeeding
- ☐ Exercise
- ☐ Risk of excessive gestational weight
- ☐ Risk of inadequate gestational weight
- ☐ Appropriate gestational weight gain
- ☐ Nutrition/healthy eating

Comments:

Goal

S Specific
M Measurable
A Action-orientated
R Realistic
T Timed
E Evaluated
R Reviewed

Post-Visit Notes-INT Group

What are their overall goals?

Self-monitoring technique:

To follow-up at next discussion:

7. Did the woman want to talk about weight?
   ☐ Yes ☐ No ☐ N/A
   Expand:

8. At what point did the Healthy Conversations arise? Specify the question number(s) where Healthy Conversations started.

9. How many minutes did you use HCS? _____ (total minutes)

10. Who did most of the talking?
    a. I did
    b. Participant and I talked about the same amount
    c. Participant

11. How much time did you spend asking open discovery questions? (What/How)
    a. Less than half of the time
    b. Half of the time
    c. Most of the time

Post-Visit Notes-INT Group

12. Check off the topics you discussed at this visit. In the notes section, expand as needed.

5As Checklist

Name: _____

Date: __/__/____

Provider: _____

Remember to focus on health and healthy behaviours and not the number on the scale.
This checklist should be used with the 5A' of Healthy Pregnancy Weight Gain™ Booklet.

ASK

- ☐ Ask for permission to discuss weight
- ☐ Be non-judgmentally curious
- ☐ Ask questions before making statements
- ☐ Explore readiness for change

ASSESS

- ☐ Pre-pregnancy BMI
- ☐ Weight at every prenatal visit
- ☐ Potential "root causes" of guideline-discordant weight gain (4Ms: Mental, Mechanical, Metabolic, Milieu)
- ☐ Consider pregnancy-related health beliefs

ADVISE

- ☐ Advise on pregnancy weight gain risk
- ☐ Discuss the need for a strategy throughout pregnancy and the postpartum period
- ☐ Explain benefits of gaining within the guidelines
- ☐ Management options
  - ○ Weight gain
  - ○ Sleep, time and stress
  - ○ Eating behaviours
  - ○ Physical activity
  - ○ Sedentary behaviour
  - ○ Mental health

AGREE

- ☐ Agree on a realistic SMART plan to achieve health behaviour outcomes
- ☐ Agree on sustainable behavioural goals
- ☐ Behavioural goals should be SMART
- ☐ Agree on the plan

ASSIST

- ☐ Assist women in identifying barriers and facilitators, educate, refer and arrange follow-up

Notes:

Canadian Obesity Network

Post-Visit Notes-INT Group

Phone Follow-Up 2

Topic(s) discussed today:

- ☐ Vitamins/Minerals
- ☐ Breastfeeding
- ☐ Exercise
- ☐ Risk of excessive gestational weight
- ☐ Risk of inadequate gestational weight
- ☐ Appropriate gestational weight gain
- ☐ Nutrition/healthy eating

Progression towards goal(s) previously set:

Self-monitoring? Yes No

Supports:

Barriers:

Was a new goal discussed? Yes No

S Specific
M Measurable
A Action-orientated
R Realistic

Post-Visit Notes-INT Group

T Timed
E Evaluated
R Reviewed

Current goals? Self-monitoring technique: To follow-up at next discussion:

4. How many minutes did you use HCS? _____ (total minutes)

5. Who did most of the talking?
    a. I did
    b. Participant and I talked about the same amount
    c. Participant

6. How much time did you spend asking open discovery questions? (What/How)
    a. Less than half of the time
    b. Half of the time
    c. Most of the time

Week 30 Lifestyle Questionnaire

Please complete the survey below.

Thank you!

To read to the participant:

"This questionnaire is similar to the one we completed together at your first visit. Like last time, I will be going through the questionnaire with you, and filling in your answers on this tablet. We have response cards here for you to flip through as we go through the questionnaire. Throughout the questionnaire, feel free to ask questions at any point. We are here to help you too."

"Do you have any questions before we start?"

Have you experienced any swelling during your pregnancy?

- ◯ No, I have not experienced swelling
- ◯ Yes, however it is minor swelling
- ◯ Yes, I have developed edema (major swelling)*

Please select any complications that you may have developed since your last study visit (check all that apply).

- ☐ None
- ☐ Anemia (low numbers of red blood cells)
- ☐ Complete/total placenta previa*
- ☐ Depression
- ☐ Gestational Diabetes (high blood sugars in pregnancy)*
- ☐ Hyperemesis gravidarum (severe nausea/vomiting, more than morning sickness)
- ☐ Hyperthyroidism (overactive thyroid)*
- ☐ Hypothyroidism (low thyroid function)*
- ☐ Incompetent cervix*
- ☐ Medical professional has stated physical activity is no longer safe during pregnancy*
- ☐ Pre-eclampsia (high blood pressure caused by symptoms like protein in urine and possible changes in blood and the liver)
- ☐ Other*

Please name and/or describe the "Other" complication(s) that you may have developed since your last study visit.

_____

Have you been admitted to the hospital for 7 days or more in a row during this pregnancy?

- ◯ Yes*
- ◯ No

Other than within this study, have you been referred to see a Registered Dietitian during this pregnancy?

- ◯ Yes*
- ◯ No

Have you experienced nausea/vomiting since your last study visit?

- ◯ No
- ◯ Yes, I have experienced morning sickness
- ◯ Yes, I have experienced hyperemesis gravidarum (severe morning sickness)

Has your nausea/vomiting changed your normal eating behaviours since your last study visit?

- ◯ Yes
- ◯ No

How has your nausea/vomiting changed your normal eating behaviours? (check all that apply)

- ☐ I eat less when I am feeling sick
- ☐ I eat more when I am feeling sick
- ☐ I change the type of foods I eat when I am feeling sick

At what stage in your pregnancy has your nausea/vomiting changed your normal eating behaviours? (check all that apply)

- ☐ Weeks 4-12
- ☐ Weeks 12-16
- ☐ Weeks 16-20
- ☐ Weeks 20-24
- ☐ Weeks 24-28
- ☐ Weeks 28-30

Are there any other symptoms of pregnancy that have affected your eating since your last study visit? E.g. constipation; heart burn; other? If so, please describe.

_____

How many of the last SEVEN DAYS have you followed Eating Well with Canada's Food Guide with appropriate serving sizes?

◯ 0 days ◯ 1 days ◯ 2 days ◯ 3 days ◯ 4 days ◯ 5 days ◯ 6 days ◯ 7 days

On average, over the past MONTH, how many WEEKS have you followed Eating Well with Canada's Food Guide with appropriate serving sizes?

◯ 0 weeks ◯ 1 week ◯ 2 weeks ◯ 3 weeks ◯ 4 weeks

On how many of the last SEVEN DAYS did you eat foods high in sugar, such as cakes, cookies, desserts, candies, etc.?

◯ 0 days ◯ 1 days ◯ 2 days ◯ 3 days ◯ 4 days ◯ 5 days ◯ 6 days ◯ 7 days

On how many of the last SEVEN DAYS did you eat foods high in fibre such as oatmeal, high fibre cereals, whole grain breads?

◯ 0 days ◯ 1 days ◯ 2 days ◯ 3 days ◯ 4 days ◯ 5 days ◯ 6 days ◯ 7 days

On how many of the last SEVEN DAYS did you eat fish or other foods high in omega-3 fats (such as walnuts, flax seeds, omega-3 fortified eggs, omega-3 fortified orange juice)?

◯ 0 days ◯ 1 days ◯ 2 days ◯ 3 days ◯ 4 days ◯ 5 days ◯ 6 days ◯ 7 days

On how many of the last SEVEN DAYS did you eat food which contained or was prepared with canola, walnut, olive, or flax oils?

◯ 0 days ◯ 1 days ◯ 2 days ◯ 3 days ◯ 4 days ◯ 5 days ◯ 6 days ◯ 7 days

On how many of the last SEVEN DAYS did you eat food that is high in folic acid, such as green leafy vegetables, edamame beans, lentils, chickpeas, beans, liver?

◯ 0 days ◯ 1 days ◯ 2 days ◯ 3 days ◯ 4 days ◯ 5 days ◯ 6 days ◯ 7 days

On how many of the last SEVEN DAYS did you eat foods high in fat, such as high fat dairy products, fatty meat, fried foods or deep fried foods?

Note: High fat dairy products are as follows: homo milk, half & half cream, coffee cream, creamers, ice cream, whipped cream, greater than 3% milk fat yogurt and full fat cheese.

◯ 0 days ◯ 1 days ◯ 2 days ◯ 3 days ◯ 4 days ◯ 5 days ◯ 6 days ◯ 7 days

On how many of the last SEVEN DAYS did you drink any alcohol?

○ 0 days ○ 1 days ○ 2 days ○ 3 days ○ 4 days ○ 5 days ○ 6 days ○ 7 days

On how many of the last SEVEN DAYS did you eat at and/or take out food from a fast food establishment?

○ 0 days ○ 1 days ○ 2 days ○ 3 days ○ 4 days ○ 5 days ○ 6 days ○ 7 days

Since your last study visit, have you changed your intake of FRUIT?

- ○ No change
- ○ Yes, my intake increased
- ○ Yes, my intake decreased
- ○ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of FRUIT in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of FRUIT in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated FRUIT in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f)Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of VEGETABLES?

- ○ No change
- ○ Yes, my intake increased
- ○ Yes, my intake decreased
- ○ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of VEGETABLES in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of VEGETABLES in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated VEGETABLES in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f)Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of GRAIN PRODUCTS (i.e. breads, cereals, rice, crackers, pitas)?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of GRAIN PRODUCTS in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of GRAIN PRODUCTS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated GRAIN PRODUCTS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f)Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of HIGH FIBRE FOODS (i.e. oatmeal, whole grain bread, bran cereal)?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of HIGH FIBRE FOODS in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of HIGH FIBRE FOODS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated HIGH FIBRE FOODS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f)Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of PASTEURIZED CHEESES?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of these PASTEURIZED CHEESES in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of these PASTEURIZED CHEESE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated PASTEURIZED CHEESE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f)Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of UNPASTEURIZED CHEESE?

Note: Unpasteurized cheeses include: feta, brie, camembert, blue veined (e.g. Roquefort), queso fresco and queso blanco. Unless it is stated on the label of those cheeses as "pasteurized".

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of UNPASTEURIZED CHEESE in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of UNPASTEURIZED CHEESE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated UNPASTEURIZED CHEESE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f)Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of YOGURT?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of YOGURT in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of YOGURT in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated YOGURT in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f)Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of DELI MEATS?

- ○ No change
- ○ Yes, my intake increased
- ○ Yes, my intake decreased
- ○ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of DELI MEATS in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of DELI MEATS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated DELI MEATS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f)Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of COOKED FISH/SHELLFISH?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of COOKED FISH/SHELLFISH in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of COOKED FISH/SHELLFISH in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated COOKED FISH/SHELLFISH in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f)Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of RAW FISH/SHELLFISH?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of RAW FISH/SHELLFISH in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of RAW FISH/SHELLFISH in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated RAW FISH/SHELLFISH in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f)Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of MEAT?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of MEAT in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of MEAT in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated MEAT in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f)Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of NUTS?

- ○ No change
- ○ Yes, my intake increased
- ○ Yes, my intake decreased
- ○ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of NUTS in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of NUTS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated NUTS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f)Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of COOKED EGGS?

- ○ No change
- ○ Yes, my intake increased
- ○ Yes, my intake decreased
- ○ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of COOKED EGGS in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of COOKED EGGS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated COOKED EGGS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f)Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of SPICY FOODS?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of SPICY FOODS in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of SPICY FOODS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated SPICY FOODS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f)Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of SALTY FOODS?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of SALTY FOODS in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of SALTY FOODS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated SALTY FOODS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f)Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of SWEET FOODS?

- ○ No change
- ○ Yes, my intake increased
- ○ Yes, my intake decreased
- ○ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of SWEET FOODS in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because they are healthy foods
- ☐ (d)Because they are affordable foods
- ☐ (e)Because that is what I could tolerate
- ☐ (f)Because I know I should eat more of these foods
- ☐ (g)Because I no longer have to restrict myself with what I eat
- ☐ (h)I was told to eat these foods by a friend or family member
- ☐ (i)I was told to eat these foods by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of SWEET FOODS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Because they are expensive
- ☐ (f)Because they are unhealthy foods
- ☐ (g)Because I know I should watch what I eat while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated SWEET FOODS in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Makes me feel sick
- ☐ (e)Unsafe to eat during pregnancy
- ☐ (f)Because they are expensive
- ☐ (g)Because they are unhealthy foods
- ☐ (h)Because I know I should watch what I eat while I am pregnant
- ☐ (i)I was told to avoid these foods by a friend or family member
- ☐ (j)I was told to avoid these foods by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of CAFFEINATED COFFEE?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of CAFFEINATED COFFEE in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because I am thirsty
- ☐ (d)Because it is a healthy drink
- ☐ (e)Because it is an affordable drink
- ☐ (f)Because that is what I could tolerate
- ☐ (g)Because I know I should drink more of this
- ☐ (h)Because I no longer have to restrict myself with what I drink
- ☐ (i)I was told to drink this by a friend or family member
- ☐ (j)I was told to drink this by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of CAFFEINATED COFFEE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Because it is expensive
- ☐ (g)Because it is an unhealthy drink
- ☐ (h)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated CAFFEINATED COFFEE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Unsafe to drink during pregnancy
- ☐ (g)Because it is expensive
- ☐ (h)Because it is an unhealthy drink
- ☐ (i)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ (j)I was told to avoid this drink by a friend or family member
- ☐ (k)I was told to avoid this drink by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of DECAFFEINATED COFFEE?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of DECAFFEINATED COFFEE in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because I am thirsty
- ☐ (d)Because it is a healthy drink
- ☐ (e)Because it is an affordable drink
- ☐ (f)Because that is what I could tolerate
- ☐ (g)Because I know I should drink more of this
- ☐ (h)Because I no longer have to restrict myself with what I drink
- ☐ (i)I was told to drink this by a friend or family member
- ☐ (j)I was told to drink this by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of DECAFFEINATED COFFEE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Because it is expensive
- ☐ (g)Because it is an unhealthy drink
- ☐ (h)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated DECAFFEINATED COFFEE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Unsafe to drink during pregnancy
- ☐ (g)Because it is expensive
- ☐ (h)Because it is an unhealthy drink
- ☐ (i)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ (j)I was told to avoid this drink by a friend or family member
- ☐ (k)I was told to avoid this drink by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of CAFFEINATED TEA?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of CAFFEINATED TEA in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because I am thirsty
- ☐ (d)Because it is a healthy drink
- ☐ (e)Because it is an affordable drink
- ☐ (f)Because that is what I could tolerate
- ☐ (g)Because I know I should drink more of this
- ☐ (h)Because I no longer have to restrict myself with what I drink
- ☐ (i)I was told to drink this by a friend or family member
- ☐ (j)I was told to drink this by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of CAFFEINATED TEA in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Because it is expensive
- ☐ (g)Because it is an unhealthy drink
- ☐ (h)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated CAFFEINATED TEA in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Unsafe to drink during pregnancy
- ☐ (g)Because it is expensive
- ☐ (h)Because it is an unhealthy drink
- ☐ (i)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ (j)I was told to avoid this drink by a friend or family member
- ☐ (k)I was told to avoid this drink by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of DECAFFEINATED TEA?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of DECAFFEINATED TEA in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because I am thirsty
- ☐ (d)Because it is a healthy drink
- ☐ (e)Because it is an affordable drink
- ☐ (f)Because that is what I could tolerate
- ☐ (g)Because I know I should drink more of this
- ☐ (h)Because I no longer have to restrict myself with what I drink
- ☐ (i)I was told to drink this by a friend or family member
- ☐ (j)I was told to drink this by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of DECAFFEINATED TEA in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Because it is expensive
- ☐ (g)Because it is an unhealthy drink
- ☐ (h)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated DECAFFEINATED TEA in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Unsafe to drink during pregnancy
- ☐ (g)Because it is expensive
- ☐ (h)Because it is an unhealthy drink
- ☐ (i)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ (j)I was told to avoid this drink by a friend or family member
- ☐ (k)I was told to avoid this drink by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of JUICE?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of JUICE in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because I am thirsty
- ☐ (d)Because it is a healthy drink
- ☐ (e)Because it is an affordable drink
- ☐ (f)Because that is what I could tolerate
- ☐ (g)Because I know I should drink more of this
- ☐ (h)Because I no longer have to restrict myself with what I drink
- ☐ (i)I was told to drink this by a friend or family member
- ☐ (j)I was told to drink this by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of JUICE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Because it is expensive
- ☐ (g)Because it is an unhealthy drink
- ☐ (h)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated JUICE in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Unsafe to drink during pregnancy
- ☐ (g)Because it is expensive
- ☐ (h)Because it is an unhealthy drink
- ☐ (i)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ (j)I was told to avoid this drink by a friend or family member
- ☐ (k)I was told to avoid this drink by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of POP?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of POP in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because I am thirsty
- ☐ (d)Because it is a healthy drink
- ☐ (e)Because it is an affordable drink
- ☐ (f)Because that is what I could tolerate
- ☐ (g)Because I know I should drink more of this
- ☐ (h)Because I no longer have to restrict myself with what I drink
- ☐ (i)I was told to drink this by a friend or family member
- ☐ (j)I was told to drink this by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of POP in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Because it is expensive
- ☐ (g)Because it is an unhealthy drink
- ☐ (h)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated POP in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Unsafe to drink during pregnancy
- ☐ (g)Because it is expensive
- ☐ (h)Because it is an unhealthy drink
- ☐ (i)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ (j)I was told to avoid this drink by a friend or family member
- ☐ (k)I was told to avoid this drink by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of MILK?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of MILK in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because I am thirsty
- ☐ (d)Because it is a healthy drink
- ☐ (e)Because it is an affordable drink
- ☐ (f)Because that is what I could tolerate
- ☐ (g)Because I know I should drink more of this
- ☐ (h)Because I no longer have to restrict myself with what I drink
- ☐ (i)I was told to drink this by a friend or family member
- ☐ (j)I was told to drink this by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of MILK in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Because it is expensive
- ☐ (g)Because it is an unhealthy drink
- ☐ (h)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated MILK in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Unsafe to drink during pregnancy
- ☐ (g)Because it is expensive
- ☐ (h)Because it is an unhealthy drink
- ☐ (i)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ (j)I was told to avoid this drink by a friend or family member
- ☐ (k)I was told to avoid this drink by one of my healthcare providers
- ☐ Other

Since your last study visit, have you changed your intake of WATER?

- ◯ No change
- ◯ Yes, my intake increased
- ◯ Yes, my intake decreased
- ◯ Yes, I have eliminated this from my diet

Please select the reason(s) you have increased your intake of WATER in your diet.

- ☐ (a)Cravings
- ☐ (b)Tastes good
- ☐ (c)Because I am thirsty
- ☐ (d)Because it is a healthy drink
- ☐ (e)Because it is an affordable drink
- ☐ (f)Because that is what I could tolerate
- ☐ (g)Because I know I should drink more of this
- ☐ (h)Because I no longer have to restrict myself with what I drink
- ☐ (i)I was told to drink this by a friend or family member
- ☐ (j)I was told to drink this by one of my healthcare providers
- ☐ Other

Please select the reason(s) you have decreased your intake of WATER in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Because it is expensive
- ☐ (g)Because it is an unhealthy drink
- ☐ (h)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ Other

Please select the reason(s) you have eliminated WATER in your diet.

- ☐ (a)Food aversion
- ☐ (b)Tastes bad
- ☐ (c)Smells bad
- ☐ (d)Because I am not as thirsty
- ☐ (e)Makes me feel sick
- ☐ (f)Unsafe to drink during pregnancy
- ☐ (g)Because it is expensive
- ☐ (h)Because it is an unhealthy drink
- ☐ (i)Because I know I should watch the amount and/or what I drink while I am pregnant
- ☐ (j)I was told to avoid this drink by a friend or family member
- ☐ (k)I was told to avoid this drink by one of my healthcare providers
- ☐ Other

Has your intake of any vitamins/minerals changed since your last study visit?

- ◯ Yes
- ◯ No

What are you currently taking?

	Not applicable	Less than once a week	1-3 days a week	4-5 days a week	6 days a week	7 days a week
Prenatal vitamin (Materna, NoName brands)	☐	☐	☐	☐	☐	☐
Iron	☐	☐	☐	☐	☐	☐
Folic Acid	☐	☐	☐	☐	☐	☐
Omega 3	☐	☐	☐	☐	☐	☐
Calcium	☐	☐	☐	☐	☐	☐
Vitamin D	☐	☐	☐	☐	☐	☐
Multivitamin (regular)	☐	☐	☐	☐	☐	☐
Women's multivitamin	☐	☐	☐	☐	☐	☐

In your second and third trimester, who is the person that does most of the cooking in your household?

- ◯ I do most of the cooking
- ◯ My husband/partner does most of the cooking
- ◯ My husband/partner and I share the cooking duties equally
- ◯ Another family member does most of the cooking
- ◯ We don't cook very often
- ◯ Other

Please specify who does most of the cooking in your household. _____

When choosing a new product in the grocery store, do you read the nutrition label before you make a decision to purchase it?

- ◯ Yes, I always read the nutrition label
- ◯ Yes, I sometimes read the nutrition label
- ◯ No, I do not read the nutrition label

On this scale, where do you feel your knowledge level is regarding healthy eating during pregnancy?

◯ Poor ◯ Less than Average ◯ Average ◯ Above Average ◯ Strong/Excellent

During pregnancy, is it clear to you:

	Yes	No
How much food is necessary to eat?	○	○
What a healthy snack should be?	○	○
What kind of foods to avoid?	○	○
How much caffeine is safe to consume?	○	○
How much alcohol is safe to drink?	○	○
What supplements are recommended?	○	○
How much weight you should gain?	○	○
How much exercise is safe?	○	○
Where you can go for credible medical advice?	○	○

Please circle the number that applies to how you felt about being in control of your weight during this pregnancy.

	1- Strongly Agree	2- Agree	3- Neither Agree nor Disagree	4- Disagree	5- Strongly Disagree
During this pregnancy, I feel in control of my weight.	○	○	○	○	○
If I eat right, and get enough exercise and rest, I can control my weight the way I want.	○	○	○	○	○
Being the right weight is mainly good luck.	○	○	○	○	○

How sure are you that during pregnancy, you can:

	1- Very Sure	2	3-Neutral	4	5- Very Unsure
Eat balanced meals	○	○	○	○	○
Eat foods that are good for you and avoid foods that are not	○	○	○	○	○
Eat foods that are good for you even when family or social life takes a lot of your time	○	○	○	○	○
Get regular exercise	○	○	○	○	○
Get regular exercise even when family or social life takes a lot of time	○	○	○	○	○

During this trimester, when you are NOT at work, how much time do you usually spend: Preparing meals (cook, set table, wash dishes):

- ○ None
- ○ Less than 1/2 hour per day
- ○ 1/2 to almost 1 hour per day
- ○ 1 to almost 2 hours per day
- ○ 2 to almost 3 hours per day
- ○ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Dressing, bathing, feeding children while you are sitting:

- ○ None
- ○ Less than 1/2 hour per day
- ○ 1/2 to almost 1 hour per day
- ○ 1 to almost 2 hours per day
- ○ 2 to almost 3 hours per day
- ○ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Dressing, bathing, feeding children while you are standing:

- ○ None
- ○ Less than 1/2 hour per day
- ○ 1/2 to almost 1 hour per day
- ○ 1 to almost 2 hours per day
- ○ 2 to almost 3 hours per day
- ○ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Playing with children while you are sitting or standing:

- ○ None
- ○ Less than 1/2 hour per day
- ○ 1/2 to almost 1 hour per day
- ○ 1 to almost 2 hours per day
- ○ 2 to almost 3 hours per day
- ○ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Playing with children while you are walking or running:

- ○ None
- ○ Less than 1/2 hour per day
- ○ 1/2 to almost 1 hour per day
- ○ 1 to almost 2 hours per day
- ○ 2 to almost 3 hours per day
- ○ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Carrying children:

- ○ None
- ○ Less than 1/2 hour per day
- ○ 1/2 to almost 1 hour per day
- ○ 1 to almost 2 hours per day
- ○ 2 to almost 3 hours per day
- ○ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Taking care of an older adult:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Sitting and using a computer or writing:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Watching TV or a video:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Sitting and reading, talking, or on the phone:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Playing with pets:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Light cleaning (Making beds, doing laundry, ironing, putting things away):

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Shopping (for food, clothes, or other items):

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Heavier cleaning (vacuum, mop, sweep, wash windows):

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, when you are NOT at work, how much time do you usually spend: Mowing lawn while on a riding mower:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, when you are NOT at work, how much time do you usually spend: Mowing lawn using a walking mower, raking, gardening, shovelling snow:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Walking slowly to go places (such as to the bus, work, visiting) * Not for fun or exercise

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, how much time do you usually spend: Walking quickly to go places (such as to the bus, work, or school): *Not for fun or exercise

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, how much time do you usually spend: Driving or riding in a car or bus:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, how much time do you usually spend: Walking slowly for fun or exercise:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Walking more quickly for fun or exercise:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Walking quickly up hills for fun or exercise:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Jogging:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Participating in a prenatal exercise class:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Swimming:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Dancing:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, do you participate in any another activities for fun or exercise? What is the name of this activity? [Leave blank if you don't have any additional activities than the ones previously listed.]

_____

During this trimester, how much time do you usually spend: Doing this activity listed above?

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, do you participate in any another activities for fun or exercise? What is the name of this activity? [Leave blank if you don't have any additional activities than the ones previously listed.]

_____

During this trimester, how much time do you usually spend: Doing this activity listed above?

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

At Work...Please fill out this section if you work for wages, as a volunteer, or if you are a student. If you are a homemaker, out of work, or unable to work, you do not need to complete this last section.

During this trimester, how much time do you usually spend: Sitting at work or in class:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, how much time do you usually spend: Standing or slowly walking at work while carrying things (heavier than a 1 gallon milk jug):

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, how much time do you usually spend: Standing or slowly walking at work not carrying anything:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, how much time do you usually spend: Walking quickly at work while carrying things (heavier than a 1 gallon milk jug):

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, how much time do you usually spend: Walking quickly at work not carrying anything:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

How would you rate your overall health at this stage in pregnancy? Would you say it is:

- ◯ Excellent
- ◯ Very good
- ◯ Good
- ◯ Fair
- ◯ Poor

Has this changed since your last study visit?

- ◯ Yes
- ◯ No

Week 34 Lifestyle Questionnaire

Please complete the survey below.

Thank you!

Have you experienced any swelling during your pregnancy?

- ◯ No, I have not experienced swelling
- ◯ Yes, however it is minor swelling
- ◯ Yes, I have developed edema (major swelling)*

Please select any complications that you may have developed since your last study visit around 30 weeks (check all that apply).

- ☐ None
- ☐ Anemia (low numbers of red blood cells)
- ☐ Complete/total placenta previa*
- ☐ Depression
- ☐ Gestational Diabetes (high blood sugars in pregnancy)*
- ☐ Hyperemesis gravidarum (severe nausea/vomiting, more than morning sickness)
- ☐ Hyperthyroidism (overactive thyroid)*
- ☐ Hypothyroidism (low thyroid function)*
- ☐ Incompetent cervix*
- ☐ Medical professional has stated physical activity is no longer safe during pregnancy*
- ☐ Pre-eclampsia (high blood pressure caused by symptoms like protein in urine and possible changes in blood and the liver)
- ☐ Other*

Please name and/or describe the "Other" complication(s) that you may have developed since your last study visit around 30 weeks.

_____

Have you been admitted to the hospital for 7 days or more in a row during this pregnancy?

- ◯ Yes*
- ◯ No

Other than within this study, have you been referred to see a Registered Dietitian during this pregnancy?

- ◯ Yes*
- ◯ No

Are there any other symptoms of pregnancy that have affected your eating? E.g. constipation; heart burn; other? If so, please describe.

_____

How many of the last SEVEN DAYS have you followed Eating Well with Canada's Food Guide with appropriate serving sizes?

◯ 0 days ◯ 1 day ◯ 2 days ◯ 3 days ◯ 4 days ◯ 5 days ◯ 6 days ◯ 7 days

On average, over the past MONTH, how many WEEKS have you followed Eating Well with Canada's Food Guide with appropriate serving sizes?

◯ 1 week ◯ 2 weeks ◯ 3 weeks ◯ 4 weeks

On how many of the last SEVEN DAYS did you eat foods high in sugar, such as cakes, cookies, desserts, candies, etc.?

○ 0 days ○ 1 days ○ 2 days ○ 3 days ○ 4 days ○ 5 days ○ 6 days ○ 7 days

On how many of the last SEVEN DAYS did you eat foods high in fibre such as oatmeal, high fibre cereals, whole grain breads?

○ 0 days ○ 1 days ○ 2 days ○ 3 days ○ 4 days ○ 5 days ○ 6 days ○ 7 days

On how many of the last SEVEN DAYS did you eat fish or other foods high in omega-3 fats (such as walnuts, flax seeds, omega-3 fortified eggs, omega-3 fortified orange juice)?

○ 0 days ○ 1 days ○ 2 days ○ 3 days ○ 4 days ○ 5 days ○ 6 days ○ 7 days

On how many of the last SEVEN DAYS did you eat food which contained or was prepared with canola, walnut, olive, or flax oils?

○ 0 days ○ 1 days ○ 2 days ○ 3 days ○ 4 days ○ 5 days ○ 6 days ○ 7 days

On how many of the last SEVEN DAYS did you eat food that is high in folic acid, such as green leafy vegetables, edamame beans, lentils, chickpeas, beans, liver?

○ 0 days ○ 1 days ○ 2 days ○ 3 days ○ 4 days ○ 5 days ○ 6 days ○ 7 days

On how many of the last SEVEN DAYS did you eat foods high in fat, such as high fat dairy products, fatty meat, fried foods or deep fried foods?

Note: High fat dairy products are as follows: homo milk, half & half cream, coffee cream, creamers, ice cream, whipped cream, greater than 3% milk fat yogurt and full fat cheese.

○ 0 days ○ 1 days ○ 2 days ○ 3 days ○ 4 days ○ 5 days ○ 6 days ○ 7 days

On how many of the last SEVEN DAYS did you drink any alcohol?

○ 0 days ○ 1 days ○ 2 days ○ 3 days ○ 4 days ○ 5 days ○ 6 days ○ 7 days

On how many of the last SEVEN DAYS did you eat at and/or take out food from a fast food establishment?

○ 0 days ○ 1 days ○ 2 days ○ 3 days ○ 4 days ○ 5 days ○ 6 days ○ 7 days

Has your intake of any vitamins/minerals changed since your last study visit?

○ Yes
○ No

What are you currently taking?

	Not applicable	Less than once a week	1-3 days a week	4-5 days a week	6 days a week	7 days a week
Prenatal vitamin (Materna, NoName brands)	☐	☐	☐	☐	☐	☐
Iron	☐	☐	☐	☐	☐	☐
Folic Acid	☐	☐	☐	☐	☐	☐
Omega 3	☐	☐	☐	☐	☐	☐
Calcium	☐	☐	☐	☐	☐	☐
Vitamin D	☐	☐	☐	☐	☐	☐
Multivitamin (regular)	☐	☐	☐	☐	☐	☐
Women's multivitamin	☐	☐	☐	☐	☐	☐

On this scale, where do you feel your knowledge level is regarding healthy eating during pregnancy?

◯ Poor ◯ Less than Average ◯ Average ◯ Above Average ◯ Strong/Excellent

If you wanted to learn more about healthy eating/food choices in pregnancy, where would you go to first? Second?

	1st choice	2nd choice
Books	○	○
Doctors	○	○
Friends/family	○	○
Google search	○	○
Magazines	○	○
Mobile App	○	○
Registered Dietitian	○	○
One of the following websites: Health Canada; Alberta Health Services; Healthy Parents Healthy Children; or MotherRisk	○	○
Television	○	○
Other	○	○

Which mobile app do you use for healthy eating/food choices in pregnancy? _____

If other, where do you go to learn more about healthy eating/food choices in pregnancy. _____

During pregnancy, is it clear to you:

	Yes	No
How much food is necessary to eat?	○	○
What a healthy snack should be?	○	○
What kind of foods to avoid?	○	○
How much caffeine is safe to consume?	○	○
How much alcohol is safe to drink?	○	○
What supplements are recommended?	○	○
How much weight you should gain?	○	○
How much exercise is safe?	○	○
Where you can go for credible medical advice?	○	○

When people try to make healthy lifestyle choices, the people around them can sometimes help or sometimes make things harder, even if they don't realize it. Please check the boxes below which best indicate how helpful these people are, or you think they would be, if you tried to make a healthy lifestyle change.

	Not at all helpful	A little helpful	Usually helpful	Always helpful	Not applicable
Husband/spouse/partner	○	○	○	○	○
Children	○	○	○	○	○
Other relatives	○	○	○	○	○
Friends	○	○	○	○	○
Co-workers	○	○	○	○	○
Healthcare providers (eg. physicians, nurses, midwives)	○	○	○	○	○

Please circle the number that applies to how you felt about being in control of your weight during this pregnancy.

	1- Strongly Agree	2- Agree	3- Neither Agree nor Disagree	4- Disagree	5- Strongly Disagree
During pregnancy, I feel in control of my weight.	○	○	○	○	○
If I eat right, and get enough exercise and rest, I can control my weight the way I want.	○	○	○	○	○
Being the right weight is mainly good luck.	○	○	○	○	○

How sure are you that during pregnancy, you can:

	1- Very Sure	2	3- Neutral	4	5- Very Unsure
Eat balanced meals	○	○	○	○	○
Eat foods that are good for you and avoid foods that are not	○	○	○	○	○
Eat foods that are good for you even when family or social life takes a lot of your time	○	○	○	○	○
Get regular exercise	○	○	○	○	○
Get regular exercise even when family or social life takes a lot of time	○	○	○	○	○

During this trimester, when you are NOT at work, how much time do you usually spend: Preparing meals (cook, set table, wash dishes):

○ None
○ Less than 1/2 hour per day
○ 1/2 to almost 1 hour per day
○ 1 to almost 2 hours per day
○ 2 to almost 3 hours per day
○ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Dressing, bathing, feeding children while you are sitting:

○ None
○ Less than 1/2 hour per day
○ 1/2 to almost 1 hour per day
○ 1 to almost 2 hours per day
○ 2 to almost 3 hours per day
○ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Dressing, bathing, feeding children while you are standing:

○ None
○ Less than 1/2 hour per day
○ 1/2 to almost 1 hour per day
○ 1 to almost 2 hours per day
○ 2 to almost 3 hours per day
○ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Playing with children while you are sitting or standing:

○ None
○ Less than 1/2 hour per day
○ 1/2 to almost 1 hour per day
○ 1 to almost 2 hours per day
○ 2 to almost 3 hours per day
○ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Playing with children while you are walking or running:

○ None
○ Less than 1/2 hour per day
○ 1/2 to almost 1 hour per day
○ 1 to almost 2 hours per day
○ 2 to almost 3 hours per day
○ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Carrying children:

○ None
○ Less than 1/2 hour per day
○ 1/2 to almost 1 hour per day
○ 1 to almost 2 hours per day
○ 2 to almost 3 hours per day
○ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Taking care of an older adult:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Sitting and using a computer or writing:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Watching TV or a video:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Sitting and reading, talking, or on the phone:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Playing with pets:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Light cleaning (Making beds, doing laundry, ironing, putting things away):

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Shopping (for food, clothes, or other items):

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, when you are NOT at work, how much time do you usually spend: Heavier cleaning (vacuum, mop, sweep, wash windows):

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, when you are NOT at work, how much time do you usually spend: Mowing lawn while on a riding mower:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, when you are NOT at work, how much time do you usually spend: Mowing lawn using a walking mower, raking, gardening, shovelling snow:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Walking slowly to go places (such as to the bus, work, visiting) * Not for fun or exercise

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, how much time do you usually spend: Walking quickly to go places (such as to the bus, work, or school): *Not for fun or exercise

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, how much time do you usually spend: Driving or riding in a car or bus:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 1 hour per day
- ◯ 1 to almost 2 hours per day
- ◯ 2 to almost 3 hours per day
- ◯ 3 or more hours per day

During this trimester, how much time do you usually spend: Walking slowly for fun or exercise:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Walking more quickly for fun or exercise:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Walking quickly up hills for fun or exercise:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Jogging:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Participating in a prenatal exercise class:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Swimming:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, how much time do you usually spend: Dancing:

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, do you participate in any another activities for fun or exercise? What is the name of this activity? [Leave blank if you don't have any additional activities than the ones previously listed.]

_____

During this trimester, how much time do you usually spend: Doing this activity listed above?

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

During this trimester, do you participate in any another activities for fun or exercise? What is the name of this activity? [Leave blank if you don't have any additional activities than the ones previously listed.]

_____

During this trimester, how much time do you usually spend: Doing this activity listed above?

- ◯ None
- ◯ Less than 1/2 hour per week
- ◯ 1/2 to almost 1 hour per week
- ◯ 1 to almost 2 hours per week
- ◯ 2 to almost 3 hours per week
- ◯ 3 or more hours per week

At Work...Please fill out this section if you work for wages, as a volunteer, or if you are a student. If you are a homemaker, out of work, or unable to work, you do not need to complete this last section.

During this trimester, how much time do you usually spend: Sitting at work or in class:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, how much time do you usually spend: Standing or slowly walking at work while carrying things (heavier than a 1 gallon milk jug):

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, how much time do you usually spend: Standing or slowly walking at work not carrying anything:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, how much time do you usually spend: Walking quickly at work while carrying things (heavier than a 1 gallon milk jug):

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

During this trimester, how much time do you usually spend: Walking quickly at work not carrying anything:

- ◯ None
- ◯ Less than 1/2 hour per day
- ◯ 1/2 to almost 2 hours per day
- ◯ 2 to almost 4 hours per day
- ◯ 4 to almost 6 hours per day
- ◯ 6 or more hours per day

How would you rate your overall health at this stage in pregnancy? Would you say it is:

- ◯ Excellent
- ◯ Very good
- ◯ Good
- ◯ Fair
- ◯ Poor

Has this changed since your last study visit around 30 weeks?

- ◯ Yes
- ◯ No

Prenatal & Infant Chart Review

Please complete the survey below.

Thank you!

Baby

Gender
- ◯ Male
- ◯ Female

Date of Birth _____

Gestational Age (weeks)

_____

Delivery Location
- ◯ Grey Nuns Community Hospital
- ◯ Fort Saskatchewan Community Hospital
- ◯ Leduc Community Hospital
- ◯ Misericordia Community Hospital
- ◯ Royal Alexandra Hospital
- ◯ Sturgeon Community Hospital
- ◯ University of Alberta Hospital

Delivery Information

Collected from Gov't of Alberta "Delivery Record" or "Notice of Live Birth or Stillbirth Form"

Gestational Weight Gain (kilograms)

[Notice of Live Birth or Stillbirth Form: Section 2: Prenatal History and BeHIP's pre-pregnancy weight if an exact pre-pegnancy weight cannot be found in chart]

_____

Gestational Age at Highest Reported Weight _____

How did their weight gain fit within the guidelines for their pre-pregnancy BMI?
- ◯ Below
- ◯ Within
- ◯ Above

Gather the following information from either of the following forms:
- Notice of Live Birth or Stillbirth: Section 3-Labour and Delivery
- Delivery Record-Part 2.

Labour Induced?
- ◯ Yes/Induced
- ◯ No/Spontaneous
- ◯ Trial of labour after previous C/S

Delivery
- ☐ Spontaneous
- ☐ Assisted Vaginal Birth (Vacuum, forceps, forceps w/rotation, assisted breach, extracted breech, forceps to after coming head)
- ☐ C/S
- ☐ Not completed

Caesarean Birth

[Delivery Record-Part Two]

- ◯ Primary
- ◯ Repeat
- ◯ Elective

Indication for caesarean birth
(if specified)

[Delivery Record-Part Two]

_____

Laceration

- ☐ None/Not checked
- ☐ Cervical
- ☐ Labial
- ☐ 1st
- ☐ 2nd
- ☐ 3rd
- ☐ 4th
- ☐ Laceration, yet degree not specified
- ☐ Not applicable (esp. if had C/S)
- ☐ Episiotomy

Augmentation

[Delivery Record-Part Two]

- ◯ Oxytocin
- ◯ N/A or not complete or ARM

Note: If the delivery record-part 2 is not present, this may also be stated as 'failure to progress' in the dictation notes OR be specified on a medication form. If the oxytocin was provided in labour, we would record that as "oxytocin" here. Oxytocin as a post-labour medication would not be included here.

Blood Loss

[Delivery Record-Part Two, or MD Dictation Notes, or Labour Nursing Notes]

- ◯ Average
- ◯ Excessive
- ◯ Not completed

Duration of Labour: Stage 1
(Total the duration in minutes)

[Delivery Record-Part Two, MD Dictation Notes, or Labour Nursing Notes]

_____

Duration of Labour: Stage 2
(Total the duration in minutes)

[Delivery Record-Part Two, MD Dictation Notes, or Labour Nursing Notes]

_____

Feeding on Discharge (check all that apply)

[Notice of Live Birth or Stillbirth Form]

- ☐ Breastfeeding
- ☐ Expressed Breastmilk
- ☐ Other

Consumption of breast milk:

[Notice of Live Birth or Stillbirth Form]

- ◯ Exclusive or Total
- ◯ Predominant
- ◯ Partial
- ◯ No Breastmilk
- ◯ Not checked (and cannot deduce from notes)

NICU admission

["Delivery Record" or "Notice of Live Birth or Stillbirth Form"]

- ☐ Yes
- ☐ No and/or not completed

Infant Outcomes

Total APGAR Score at 5 mins
(maximum of 10) _____

Infant Birth Weight (grams) _____

Gather the following information from the NEWBORN RECORD.

Size for Gestational Age

- ◯ > 90%ile (LGA criteria)
- ◯ 10-90 %ile
- ◯ < 10 %ile (SGA criteria)
- ◯ Not completed

Note: If the notes do not have this calculated, use the graph on the back of the Newborn Record form to decide the %ile.

Weight at Prenatal Visits

Gather the following information from the Alberta Prenatal Record-Page 2.

Note: If there is no variable recorded in the chart or you cannot read the number, please record as the following:
Weight: 999.9
Gestational age: 99.9

Total Number of prenatal visits _____

Visit 1

Date of Visit 1 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?

- ◯ Yes
- ◯ No

Visit 2

Date of Visit 2 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?

- ◯ Yes
- ◯ No

Visit 3

Date of Visit 3 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Visit 4

Date of Visit 4 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Visit 5

Date of Visit 5 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Visit 6

Date of Visit 6 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Visit 7

Date of Visit 7 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Visit 8

Date of Visit 8 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Visit 9

Date of Visit 9 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Visit 10

Date of Visit 10 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Visit 11

Date of Visit 11 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Visit 12

Date of Visit 12 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Visit 13

Date of Visit 13 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Visit 14

Date of Visit 14 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Visit 15

Date of Visit 15 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Date of Visit 16 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Visit 17

Date of Visit 17 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Visit 18

Date of Visit 18 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Visit 19

Date of Visit 19 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Visit 20

Date of Visit 20 _____

Weight in kilograms
(Record to one decimal place) _____

Note: 1 kg=2.204 lbs

Gestational Age (weeks)
(Enter in weeks to one decimal place) _____

Add another visit?
◯ Yes
◯ No

Additional Visits

If the participant had more that 20 prenatal visits. Enter the following for each additional prenatal visit: _____

Visit 21: Date, Weight, Gestational Age
Visit 22: Date, Weight, Gestational Age
etc.

Note: Record weight in kilograms to one decimal place and gestational age in weeks to one decimal place.

If you were unable to enter any variables because of the format of the form, record the data explicitly here. _____

Postpartum Questionnaire

AC & INT Groups

Congratulations on your new bundle of joy!

Attached is the last survey of the BeHIP study. If you could kindly complete this at your own convenience, that would be appreciated.

Thank you!

Be Healthy in Pregnancy (BeHIP) study team

Did you experience any swelling during your pregnancy?

- ◯ No, I did not experience swelling
- ◯ Yes, however it was minor swelling
- ◯ Yes, I developed major swelling (edema)

Did you develop any complications of pregnancy between your second phone call (around 34 weeks) and delivery?

- ◯ Yes
- ◯ No

Please select any complications that you may have developed since 34 weeks (check all that apply).

- ☐ None
- ☐ Anemia (low numbers of red blood cells)
- ☐ Complete/total placenta previa*
- ☐ Depression
- ☐ Gestational Diabetes (high blood sugars in pregnancy)*
- ☐ Hyperemesis gravidarum (severe nausea/vomiting, more than morning sickness)
- ☐ Hyperthyroidism (overactive thyroid)*
- ☐ Hypothyroidism (low thyroid function)*
- ☐ Incompetent cervix*
- ☐ Medical professional has stated physical activity is no longer safe during pregnancy*
- ☐ Pre-eclampsia (high blood pressure caused by symptoms like protein in urine and possible changes in blood and the liver)
- ☐ Other*

Please name and/or describe the "Other" complication(s) that you may have developed since 34 weeks.

_____

Were you admitted to the hospital for 7 days or more in a row during this pregnancy?

- ◯ Yes*
- ◯ No

What type of healthcare provider did you visit for your routine prenatal visits throughout your pregnancy (outside of this study)?

- ◯ Family Doctor
- ◯ OB/GYN
- ◯ Both Family Doctor & OB/GYN
- ◯ Other

"Other": Please specify the healthcare provider that provided your care during this pregnancy.

_____

Please specify the number of WEEKS that you were under care of your Family Doctor:

_____

Please specify the number of WEEKS that you were under the care of your OB/GYN:

_____

Part B: Gestational Weight Gain

What was your HIGHEST weight in pregnancy? Please specify if this is in kilograms (kg) or pounds (lbs).

_____

If you don't know, type "Don't know".

Who was the FIRST person who told you about the weight gain guidelines for pregnancy?

- ◯ Family Physician
- ◯ Obstetrician
- ◯ Nurse
- ◯ Registered Dietitian in this study (Laura or Bethany)
- ◯ Family Member
- ◯ No one, I already knew them before this pregnancy
- ◯ No one, I found out through researching myself
- ◯ No one, I did not know there were weight gain guidelines for pregnancy
- ◯ Other

Did your healthcare provider(s) (NOT in this research study) discuss a weight gain range with you during your pregnancy?

- ◯ Yes
- ◯ No
- ◯ I can't remember

Was the amount of weight you gained during pregnancy important to you?

- ◯ Yes
- ◯ No

WHY was the amount of weight you gained in pregnancy important to you? (check all that apply)

- ☐ To have a healthy pregnancy
- ☐ To deliver a healthy baby
- ☐ For my health
- ☐ For the long term health of my child
- ☐ To have an easier delivery
- ☐ Because my healthcare provider told me it was important
- ☐ To Makes it easier to lose the weight after giving birth
- ☐ To make it easier to lose the weight after giving birth
- ☐ Other

"Other": Please specify any other reasons why the amount of weight you gained in pregnancy was important to you.

_____

What made the biggest impact on your knowledge about healthy pregnancy weight gain?

- ◯ Resources shown or given to me from my prenatal healthcare provider
- ◯ Discussion with my prenatal healthcare provider
- ◯ Both the resources and the discussion
- ◯ Discussion with the BeHIP study Registered Dietitian
- ◯ Both the discussion with the BeHIP study Registered Dietitian and my prenatal healthcare provider
- ◯ Resources I found myself (e.g. online, printed resources)
- ◯ Don't know/can't remember
- ◯ Other

"Other": Please specify what made the biggest impact on your knowledge about healthy pregnancy weight gain.

_____

Did you make any INTENTIONAL changes to help manage your WEIGHT during pregnancy? (Check all that apply)

- ☐ Yes, I made changes to the food I ate
- ☐ Yes, I increased my physical activity
- ☐ Yes, I changed my sleeping habits
- ☐ Yes, other
- ☐ No, I did not make any intentional changes

"Other": Please specify what other intentional changes you made to help manage your weight during pregnancy.

_____

Was there anything you formally kept track of in pregnancy for health reasons?

- ◯ Yes
- ◯ No

E.g. food journaling, steps per day, weight gain, exercise habits, blood pressure, heart rate, fetal movements etc.

If yes, please briefly describe what you kept track of:

_____

Did your healthcare provider show, give or discuss any resources during your pregnancy specific to weight gain? Please check the ones that you did receive.

- ☐ No, my healthcare provider did not show, give or discuss any weight gain resources with me
- ☐ Yes, the Healthy Eating & Active Living for Pregnancy booklet
- ☐ Yes, the Healthy Parents, Healthy Children resource (print or online)
- ☐ Yes, the Singleton Weight Gain Graphs
- ☐ Yes, the Healthy Pregnancy Weight gain calculator
- ☐ Don't know/can't remember
- ☐ Other

If you remember the title of the "Other" resource you received that was specific to weight gain in pregnancy, feel free to write it in this text box.

_____

Now that you are in the postpartum period, how sure are you that you can:

	1- Very Sure	2	3- Neutral	4	5- Very Unsure
Eat balanced meals	○	○	○	○	○
Eat foods that are good for you and avoid foods that are not	○	○	○	○	○
Eat foods that are good for you even when family or social life takes a lot of your time	○	○	○	○	○
Get regular exercise	○	○	○	○	○
Get regular exercise even when family or social life takes a lot of time	○	○	○	○	○

On this scale, where do you feel your knowledge level is regarding healthy eating in the postpartum period?

○ Poor ○ Less than Average ○ Average ○ Above Average ○ Strong/Excellent

Rate your overall health during this pregnancy.

○ Excellent
○ Very Good
○ Good
○ Fair
○ Poor

Was this your FIRST full term pregnancy?

○ Yes
○ No

How did you feel your overall health was during this pregnancy compared to the last?

○ Better
○ Worse
○ About the same
○ I don't know

You rated your health this pregnancy as "BETTER" than last pregnancy. Please describe what made you rate your health "BETTER" during this pregnancy.

_____

(Optional question)

You rated your health this pregnancy as "WORSE" than last pregnancy. Please describe what made you rate your health "WORSE" during this pregnancy.

_____

(Optional question)

Part C: Prenatal Care

How satisfied are you with the lifestyle support you received from your family doctor during this pregnancy?

- ◯ Very satisfied
- ◯ Satisfied
- ◯ Neutral
- ◯ Dissatisfied
- ◯ Very Dissatisfied
- ◯ Not applicable

How satisfied are you with the lifestyle support you received from your OB/GYN during this pregnancy?

- ◯ Very satisfied
- ◯ Satisfied
- ◯ Neutral
- ◯ Dissatisfied
- ◯ Very Dissatisfied
- ◯ Not applicable

How satisfied are you with the lifestyle support you received from your Registered Dietitian (Laura or Bethany) during this pregnancy?

- ◯ Very satisfied
- ◯ Satisfied
- ◯ Neutral
- ◯ Dissatisfied
- ◯ Very Dissatisfied
- ◯ Not applicable

Quality of Prenatal Care Questionnaire

This questionnaire asks about the prenatal care you received from a family doctor, OB/GYN or other healthcare providers during your pregnancy. You might have seen more than one healthcare provider for your care but please think of the prenatal care you received OVERALL when completing this questionnaire. Please read each statement carefully and indicate how much you agree or disagree by selecting the correct response.

Note: Please DO NOT consider the care you received with the Registered Dietitian (Laura or Bethany) from within this study when completing these questions. We will ask you separate questions regarding the support you received within the Be Healthy in Pregnancy Study.

		Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	I had as much time with my prenatal care provider(s) as I needed	○	○	○	○	○
2	My prenatal care provider(s) gave me options for my birth experience	○	○	○	○	○
3	I was given adequate information about prenatal tests and procedures	○	○	○	○	○
4	I was given enough information to meet my needs about breastfeeding	○	○	○	○	○
5	My prenatal care provider(s) respected me	○	○	○	○	○
6	I was always given honest answers to my questions	○	○	○	○	○
7	My prenatal care provider(s) respected my knowledge and experience	○	○	○	○	○
8	My prenatal care provider(s) was rushed	○	○	○	○	○
9	I knew how to get in touch with my prenatal care provider(s)	○	○	○	○	○
10	My prenatal care provider(s) prepared me for my birth experience	○	○	○	○	○
11						

	Everyone involved in my prenatal care received the important information about me	○	○	○	○	○
12	Someone in my prenatal care provider(s)'s office always returned my calls	○	○	○	○	○
13	My prenatal care provider(s) spent time talking with me about my expectations for labour and delivery	○	○	○	○	○
14	My decisions were respected by my prenatal care provider(s)	○	○	○	○	○
15	My prenatal care provider(s) was abrupt with me	○	○	○	○	○
16	I was given enough information about the safety of moderate exercise during pregnancy	○	○	○	○	○
17	I was screened adequately for potential problems with my pregnancy	○	○	○	○	○
18	My prenatal care provider(s) always had time to answer my questions	○	○	○	○	○
19	My prenatal care provider(s) was patient	○	○	○	○	○
20	I received adequate information about my diet during pregnancy	○	○	○	○	○
21	I was supported by my prenatal care provider(s) in doing what I felt was right for me	○	○	○	○	○
22	The results of tests were explained to me in a way I could understand	○	○	○	○	○
23	I was rushed during my prenatal care visits	○	○	○	○	○
24	My prenatal care provider(s) was interested in how my pregnancy was affecting my life	○	○	○	○	○
25	My prenatal care provider(s) supported me	○	○	○	○	○
26	My prenatal care provider(s) paid close attention when I was speaking	○	○	○	○	○
27						

	I was linked to programs in the community that were helpful to me	○	○	○	○	○
28	My prenatal care provider(s) made me feel like I was wasting their time	○	○	○	○	○
29	My concerns were taken seriously	○	○	○	○	○
30	My prenatal care provider(s) made time for me to talk	○	○	○	○	○
31	I received adequate information about alcohol use during pregnancy	○	○	○	○	○
32	My prenatal care provider(s) was available when I had questions or concerns	○	○	○	○	○
33	My prenatal care provider(s) gave straightforward answers to my questions	○	○	○	○	○
34	I was in control of the decisions being made about my prenatal care	○	○	○	○	○
35	I could always reach someone in the office/clinic if I needed something	○	○	○	○	○
36	My prenatal care provider(s) supported my decisions	○	○	○	○	○
37	I was at ease with my prenatal care provider(s)	○	○	○	○	○
38	I could reach my prenatal care provider(s) by phone when necessary	○	○	○	○	○
39	My prenatal care provider(s) gave me enough information to Makes decisions for myself	○	○	○	○	○
40	I was afraid to ask my prenatal care provider(s) questions	○	○	○	○	○
41	My values and beliefs were respected by my prenatal care provider(s)	○	○	○	○	○
42	I was given adequate information about depression in pregnancy	○	○	○	○	○
43						

	My prenatal care provider(s) kept my information confidential	○	○	○	○	○
44	My prenatal care provider(s) took time to listen	○	○	○	○	○
45	I fully understood the reasons for blood work and other tests my prenatal care provider(s) ordered for me	○	○	○	○	○
46	My prenatal care provider(s) took time to ask about things that were important to me	○	○	○	○	○

Part D: Feedback specific to the BeHIP Study

Note: This is the last section you will need to complete. You are almost done! Hooray!!! :)

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I found the additional interaction with the Registered Dietitian helpful:	○	○	○	○	○
I felt having access to a Registered Dietitian complimented the care I received from my family doctor, OB/GYN well:	○	○	○	○	○
My study Registered Dietitian respected my knowledge and experience:	○	○	○	○	○
I feel I received adequate information about my diet during pregnancy:	○	○	○	○	○
My study Registered Dietitian was interested in me and how this pregnancy was affecting my life:	○	○	○	○	○
My study Registered Dietitian was available when I had questions or concerns:	○	○	○	○	○
My study Registered Dietitian gave helpful answers to my questions:	○	○	○	○	○
I felt at ease with my study Registered Dietitian:	○	○	○	○	○
My study Registered Dietitian took time to listen:	○	○	○	○	○
My study Registered Dietitian took time to ask about things that were important to me:	○	○	○	○	○

The length of the visits were appropriate:

- ○ Strongly Agree
- ○ Agree
- ○ Neither Agree nor Disagree
- ○ Disagree
- ○ Strongly Disagree

How much time would you recommend for visits?

_____

I found the follow-up phone calls helpful:

- ◯ Strongly Agree
- ◯ Agree
- ◯ Neither Agree nor Disagree
- ◯ Disagree
- ◯ Strongly Disagree

Please describe:

Note: Response not required.

_____

Participating in this study increased my awareness of healthy lifestyles in pregnancy

- ◯ Strongly Agree
- ◯ Agree
- ◯ Neutral
- ◯ Disagree
- ◯ Strongly Disagree

Please describe:

Note: Response not required.

_____

Participating in this study helped me to improve at least one of my lifestyle habits:

- ◯ Strongly Agree
- ◯ Agree
- ◯ Neutral
- ◯ Disagree
- ◯ Strongly Disagree

Please describe:

Note: Response not required.

_____

Participating in this study was beneficial for me:

- ◯ Strongly Agree
- ◯ Agree
- ◯ Neutral
- ◯ Disagree
- ◯ Strongly Disagree

Please describe in what ways the study was beneficial:

Note: Response not required.

_____

Please describe reasons why the study was not beneficial to you:

Note: Response not required.

_____

When in pregnancy would it be most helpful to have access to a Registered Dietitian? (check all that apply)

- ☐ Trimester 1 (weeks 1-13)
- ☐ Trimester 2 (weeks 14-26)
- ☐ Trimester 3 (weeks 27-40)

Are there any other supports you feel would help pregnant women have a healthy pregnancy?

Note: Response not required.

_____

If you have any further comments about this study (suggestions for improvement, dislikes, likes), or any other ideas for improving prenatal care, please write them here:

Note: Response not required.

_____

All done! Your participation in the BeHIP study is complete!

Thank you for your participation in helping to provide input towards improving maternal health in Alberta!

Postpartum Questionnaire-PC Group

Congratulations on having a baby in the past year!

Attached is the prenatal care survey for the Be Healthy in Pregnancy Study. If you could kindly complete this at your own convenience, that would be appreciated.

Note: We think it will take you approximately 15 minutes to complete the survey. However, as we know being a new mom is busy, if you need to pause the survey and come back, there is a save and return button.

Thank you!

Be Healthy in Pregnancy (BeHIP) study team

Primary Study Investigator:
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Phone: 780-492-7742
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Part A: General Background. These questions are general questions about you. Your answers are confidential.

What is your birth date? _____

Age Upon Study Entry _____

Were you born in Canada?

- ◯ Yes
- ◯ No

How long have you lived in Canada?

- ◯ Less than 1 year
- ◯ 1-3 years
- ◯ 4-5 years
- ◯ greater than 5 years

How would you describe your ethnic origin (race)?

- ◯ Arab
- ◯ Black (African, American, North American)
- ◯ Caucasian/white (e.g. English, French, German, Greek, Irish, Polish, Russian, Scottish, Ukrainian)
- ◯ Chinese
- ◯ Filipino
- ◯ Japanese
- ◯ Korean
- ◯ Latin American
- ◯ Native/Aboriginal Peoples of North America (First Nations, North American Indian, Metis, Inuit)
- ◯ South Asian
- ◯ South East Asian
- ◯ West Asian
- ◯ Other

If other, please specify how you would describe your ethnic origin (race):

_____

What is the highest level of education that you have completed?

- ◯ Less than high school diploma
- ◯ Completed high school diploma
- ◯ Completed trade, technical, or vocational school or business/community college (e.g.. SAIT, NAIT)
- ◯ Completed university undergraduate degree
- ◯ Completed post-graduate degree

What is your marital status? At present are you:

- ◯ Single (never married)
- ◯ Married
- ◯ Common-law/living with partner/living as married
- ◯ Divorced
- ◯ Widowed
- ◯ Separated

What is the total income, before taxes and deductions, of all the household members from all sources in the past 12 months? (Your best guess is okay.)

- ◯ Less than $20,000
- ◯ $20,000-$39,000
- ◯ $40,000-$69,999
- ◯ $70,000-$99,999
- ◯ $100,000 or more

How many biological children do you have?

_____
((enter a number))

Part B: Pregnancy and Medical Information

Did you experience any swelling during this last pregnancy?

- ◯ No, I did not experience swelling
- ◯ Yes, however it was minor swelling
- ◯ Yes, I developed major swelling (edema)

What was the main type of healthcare provider that you visited for your routine prenatal visits throughout your pregnancy?

- ◯ Family Doctor
- ◯ OB/GYN
- ◯ Both Family Doctor & OB/GYN
- ◯ Other

"Other": Please specify the healthcare provider that provided your care during this pregnancy.

_____

Please specify the number of WEEKS that you were under care of your Family Doctor:

_____

Please specify the number of WEEKS that you were under the care of your OB/GYN:

_____

How tall are you?

Please specify if this is in feet and inches (ft and in) or centimetres (cm).

_____

How much did you weigh BEFORE your last pregnancy? Please specify if this is in kilograms (kg) or pounds (lbs). If you don't know, type "Don't know".

_____

Pre-Pregnancy BMI

_____

Pre-Pregnancy BMI Category

- ◯ Underweight
- ◯ Normal Weight
- ◯ Overweight
- ◯ Obese

What was your HIGHEST weight this pregnancy?

Please specify if this is in kilograms (kg) or pounds (lbs).

_____

If you don't know, type "Don't know".

With the self-reported weight, does their weight gain fall below, within or above their recommended guidelines?

- ◯ Below
- ◯ Within
- ◯ Above

Did your healthcare provider(s) discuss a weight gain range with you during your pregnancy?

- ◯ Yes
- ◯ No
- ◯ Don't know

When did your healthcare provider first discuss this with you?

- ◯ Before I was pregnant
- ◯ First visit
- ◯ Within 1st trimester
- ◯ Within 2nd trimester
- ◯ Within 3rd trimester
- ◯ I don't remember

Would you have liked to discuss weight gain with your healthcare provider?

- ◯ Yes
- ◯ No
- ◯ Not sure

Who was the FIRST person who told you about the weight gain guidelines for pregnancy?

- ◯ Family Physician
- ◯ Obstetrician
- ◯ Nurse
- ◯ Family Member
- ◯ No one, I already knew them before this pregnancy
- ◯ No one, I found out through researching myself
- ◯ No one, I did not know there were weight gain guidelines for pregnancy
- ◯ Other

Was the amount of weight you gained during pregnancy important to you?

- ◯ Yes
- ◯ No

Why was the amount of weight you gained in pregnancy important to you? (check all that apply)

- ☐ To have a healthy pregnancy
- ☐ To deliver a healthy baby
- ☐ For my health
- ☐ For the long term health of my child
- ☐ To have an easier delivery
- ☐ Because my healthcare provider told me it was important
- ☐ To make it easier to lose the weight after giving birth
- ☐ Other

"Other": Please specify any other reasons why the amount of weight you gained in pregnancy was important to you.

_____

What made the biggest impact on your knowledge about healthy pregnancy weight gain?

- ◯ Resources shown or given to me from my prenatal healthcare provider
- ◯ Discussion with my prenatal healthcare provider
- ◯ Both the resources and the discussion
- ◯ Resources I found myself (e.g. online, printed resources)
- ◯ Don't know/can't remember
- ◯ Other

"Other": Please specify what made the biggest impact on your knowledge about healthy pregnancy weight gain.

_____

Did you make any INTENTIONAL changes to help manage your WEIGHT during pregnancy? (Check all that apply)

- ☐ Yes, I made changes to the type of food I ate
- ☐ Yes, I made changes to the amount of food I ate
- ☐ Yes, I was more physically active
- ☐ Yes, I was less physically active
- ☐ Yes, I changed my sleeping habits
- ☐ Yes, other
- ☐ No, I did not make any intentional changes

"Other": Please specify what other intentional changes you made to help manage your weight during pregnancy.

_____

Was there anything you formally kept track of in pregnancy for health reasons? E.g. your food intake, blood pressure, exercise, weight gain, heart rate, fetal movement, etc.

- ◯ Yes
- ◯ No

If yes, please briefly describe what you kept track of:

_____

Did your healthcare provider show, give or discuss any resources during your pregnancy specific to weight gain? Please check the ones that you did receive.

- ☐ Healthy Eating & Active Living for Pregnancy booklet
- ☐ Healthy Parents, Healthy Children resource (print or online)
- ☐ Singleton Weight Gain Graphs
- ☐ BMI or Healthy Pregnancy Weight gain calculator
- ☐ No, my healthcare provider did not show, give or discuss any weight gain resources with me
- ☐ Don't know/can't remember
- ☐ Other

If you remember the title of the "Other" resource you received that was specific to weight gain in pregnancy, feel free to write it in this text box.

_____

Part D: Baby's Information at Birth

What is your child's birth date? _____

What was your baby's weight at birth? Please specify if this is in kilograms (kg) or pounds (lbs). If you don't know, type "Don't know". _____

What was your baby's length at birth?

Please specify if this is in centimetres (cm) or inches (in). _____

If you don't know, type "Don't know".

Where was your baby born?

- ◯ Grey Nuns Community Hospital
- ◯ Fort Saskatchewan Community Hospital
- ◯ Leduc Community Hospital
- ◯ Misericordia Community Hospital
- ◯ Royal Alexandra Hospital
- ◯ Sturgeon Community Hospital
- ◯ University of Alberta Hospital

Part E: Prenatal Care

How satisfied are you with the lifestyle support you received from your family doctor during this pregnancy?

Note: Lifestyle support may include talking about what is healthy to eat, how much to eat in pregnancy, safe physical activity etc.

- ◯ Very satisfied
- ◯ Satisfied
- ◯ Neutral
- ◯ Dissatisfied
- ◯ Very Dissatisfied
- ◯ Not applicable

How satisfied are you with the lifestyle support you received from your obstetrician during this pregnancy?

Note: Lifestyle support may include talking about what is healthy to eat, how much to eat in pregnancy, safe physical activity etc

- ◯ Very satisfied
- ◯ Satisfied
- ◯ Neutral
- ◯ Dissatisfied
- ◯ Very Dissatisfied
- ◯ Not applicable

How satisfied are you with the lifestyle support from any other healthcare providers (i.e.. nurse, doula, physiotherapist, etc.) during this pregnancy?

Note: Lifestyle support may include talking about what is healthy to eat, how much to eat in pregnancy, safe physical activity etc

- ◯ Very satisfied
- ◯ Satisfied
- ◯ Neutral
- ◯ Dissatisfied
- ◯ Very Dissatisfied
- ◯ Not applicable

Quality of Prenatal Care Questionnaire

This questionnaire asks about the prenatal care you received from a physician, or other healthcare providers during your pregnancy. You might have seen more than one healthcare provider for your care but please think of the prenatal care you received OVERALL when completing this questionnaire. Please read each statement carefully and indicate how much you agree or disagree by selecting the correct response.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I had as much time with my prenatal care provider(s) as I needed	○	○	○	○	○
My prenatal care provider(s) gave me options for my birth experience	○	○	○	○	○
I was given adequate information about prenatal tests and procedures	○	○	○	○	○
I was given enough information to meet my needs about breastfeeding	○	○	○	○	○
My prenatal care provider(s) respected me	○	○	○	○	○
I was always given honest answers to my questions	○	○	○	○	○
My prenatal care provider(s) respected my knowledge and experience	○	○	○	○	○
My prenatal care provider(s) was rushed	○	○	○	○	○
I knew how to get in touch with my prenatal care provider(s)	○	○	○	○	○
My prenatal care provider(s) prepared me for my birth experience	○	○	○	○	○
Everyone involved in my prenatal care received the important information about me	○	○	○	○	○
Someone in my prenatal care provider(s)'s office always returned my calls	○	○	○	○	○

My prenatal care provider(s) spent time talking with me about my expectations for labour and delivery	○	○	○	○	○
My decisions were respected by my prenatal care provider(s)	○	○	○	○	○
My prenatal care provider(s) was abrupt with me	○	○	○	○	○
I was given enough information about the safety of moderate exercise during pregnancy	○	○	○	○	○
I was screened adequately for potential problems with my pregnancy	○	○	○	○	○
My prenatal care provider(s) always had time to answer my questions	○	○	○	○	○
My prenatal care provider(s) was patient	○	○	○	○	○
I received adequate information about my diet during pregnancy	○	○	○	○	○
I was supported by my prenatal care provider(s) in doing what I felt was right for me	○	○	○	○	○
The results of tests were explained to me in a way I could understand	○	○	○	○	○
I was rushed during my prenatal care visits	○	○	○	○	○
My prenatal care provider(s) was interested in how my pregnancy was affecting my life	○	○	○	○	○
My prenatal care provider(s) supported me	○	○	○	○	○
My prenatal care provider(s) paid close attention when I was speaking	○	○	○	○	○
I was linked to programs in the community that were helpful to me	○	○	○	○	○
My prenatal care provider(s) made me feel like I was wasting their time	○	○	○	○	○

My concerns were taken seriously	○	○	○	○	○
My prenatal care provider(s) made time for me to talk	○	○	○	○	○
I received adequate information about alcohol use during pregnancy	○	○	○	○	○
My prenatal care provider(s) was available when I had questions or concerns	○	○	○	○	○
My prenatal care provider(s) gave straightforward answers to my questions	○	○	○	○	○
I was in control of the decisions being made about my prenatal care	○	○	○	○	○
I could always reach someone in the office/clinic if I needed something	○	○	○	○	○
My prenatal care provider(s) supported my decisions	○	○	○	○	○
I was at ease with my prenatal care provider(s)	○	○	○	○	○
I could reach my prenatal care provider(s) by phone when necessary	○	○	○	○	○
My prenatal care provider(s) gave me enough information to Makes decisions for myself	○	○	○	○	○
I was afraid to ask my prenatal care provider(s) questions	○	○	○	○	○
My values and beliefs were respected by my prenatal care provider(s)	○	○	○	○	○
I was given adequate information about depression in pregnancy	○	○	○	○	○
My prenatal care provider(s) kept my information confidential	○	○	○	○	○
My prenatal care provider(s) took time to listen	○	○	○	○	○
I fully understood the reasons for blood work and other tests my prenatal care provider(s) ordered for me	○	○	○	○	○

My prenatal care provider(s) took time to ask about things that were important to me	○	○	○	○	○

What supports would you have liked from your healthcare provider to help you achieve a healthy pregnancy? At what stage during your pregnancy would you have liked this/these support(s)?

_____

Are there any other supports you feel would help pregnant women have a healthy pregnancy? (optional question)

_____

Are you okay with granting approval to the research team to access you and your baby's Alberta health records by providing your Alberta Healthcare number (solely for data collection purposes)?

○ Yes
○ No

Please enter your Alberta Healthcare Number

_____

Note: Completing this portion with your Alberta Healthcare Number implies consent to allow the study team to access your delivery and infant's birth records. This number will be recorded on a password-protected document that will only be available to members of the research team. All data obtained from your medical chart review will be associated with your study identification number (it will NOT be associated with you or your infant's name).

Group Allocation

○ BeHIP+ (Intervention)
○ BeHIP (Control)
○ Passive Control