NUNNERY, DANIELLE, Ph.D. Food Security, Diet Behavior, Home Food Environment, and Pregnancy Outcomes among Pregnant WIC Participants. (2016) Directed by Dr. Jigna Dharod. 178 pp.

Literature suggests that low-income pregnant women are at significant risk of experiencing socio-economic disparities that jeopardize their health and nutritional status. Women from economically disadvantaged backgrounds are more likely to be overweight or obese before and during pregnancy. These women are also more likely to experience food insecurity and limited resources that can lead to poor diet quality and excessive gestational weight gain (GWG) and subsequent pregnancy complications. Life course theory and the fetal origins of disease hypothesis cite that these factors can then influence the health trajectory of newborns by increasing the risk of fetal adiposity (large for gestational age) and subsequent metabolic dysfunction later in life.

The overall objectives of this study were to (a) examine the relationship between home food environment (fruit and vegetable (F&V) availability), diet behavior (frequency of F&V intake), and food security status of pregnant WIC participants; (b) examine the association between food security status and pregnancy outcomes (GWG); and (c) examine the association between food security status and birth outcomes (birth weight and gestational age or size for gestational age).

A cross-sectional community based design was used to interview pregnant women during a WIC maternity certification appointment. WIC clients were included if they were ≥ 18 years old, 13–27 weeks pregnant, and able to speak English or Spanish.

Food insecurity was found among 43% of participants. Food insecurity was not significantly associated with any sociodemographic variables in this sample, or directly

associated with GWG or birth outcomes. However, home food environment (availability of F&V) indirectly mediated the relationship between food security status and daily F&V intake in a positive manner ($p < 0.05$). Excess GWG was significantly associated with being single, primiparous, an overweight/obese pre-pregnancy BMI, unplanned pregnancy, and having a non-normal size for gestational age infant. Regression analyses further indicated that identifying as African American, having an unplanned pregnancy, and being obese put them at significant odds of gaining excess weight.

The findings suggest that while food insecurity had no direct associations or affects, it may be indirectly impacting fruit and vegetable intake by altering availability of these items. Addressing family planning and pre-conception weight status may be key in reducing excess GWG and the risk of having a non-normal size for gestational age infant.

FOOD SECURITY, DIET BEHAVIOR, HOME FOOD ENVIRONMENT, AND PREGNANCY OUTCOMES AMONG PREGNANT WIC PARTICIPANTS

by

Danielle Nunnery

A Dissertation Submitted to
the Faculty of The Graduate School at
The University of North Carolina at Greensboro
in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Greensboro
2016

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ACKNOWLEDGMENTS

I would like to first thank my advisor, Dr. Jigna Dharod for all of her advice, guidance, and, support during the completion of both my graduate degrees. I would also like to thank the other members of my committee, Dr. Natasha Brown, Dr. Maura Nsonwu, and Dr. Lauren Haldeman, for their help, support, and guidance throughout this process. I would also like to thank my friends and family for all of their support, especially, my best friend and life partner in crime, Josh— you reminded me to breathe. I would also like to thank all those teachers and unofficial mentors I have had along the way who have shown me that I can aspire to greater things than I think I am capable of— Ms. Tracy Blackard— you were the first. A special thank you to all the staff at the Guilford County WIC Department, thanks for letting me shadow you and work with for the past few years. Last but not least, I would like to thank our research team. This project would not have been possible without all of your time and dedication to this project.

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CHAPTER I

INTRODUCTION

Existing literature indicates that low-income pregnant women are at significant risk of experiencing socio-economic disparities that can negatively impact not only their overall health and nutritional status but their birth outcomes. Women from economically disadvantaged backgrounds are more likely to be overweight or obese before and during pregnancy. Low-income women are also more likely to experience food insecurity and limited resources that can lead to poor diet quality and excessive gestational weight gain and subsequent pregnancy complications. Food insecurity, or the limited or uncertain access to nutritionally adequate and culturally appropriate foods, affects roughly 14% (17.4 million) U.S. households. Food insecurity is more common among households headed by a single mother (35%), those who identify as African American (26%) or Hispanic (22%), and those who are considered low-income (< 185 % of the poverty guideline) (34%) (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2015). Previous research indicates that food insecurity is strongly associated with poor diet, overweight, obesity and chronic diseases, particularly, among women and caretakers of the household (Ivers & Cullen, 2011; Kaiser et al., 2003; Larson & Story, 2011; Leung, Epel, Ritchie, Crawford, & Laraia, 2014). Women, who are often the main meal preparers, food purchasers, and distributors of food for the household, may limit the amount or quality of their food consumption in order to provide or ration for their children in situations of

food insecurity (Laraia, Epel, & Siega-Riz, 2013; Tarasuk, 2001). Home food environment or the availability of food can influence dietary intake and, potentially, diet quality in women. Food insecure households often resort to eating cheap calorie dense but nutrient poor foods in order to save money (Drewnowski & Darmon, 2005). Studies have demonstrated that the availability of nutrient rich fruits and vegetables was significantly lower while the availability of processed, packaged foods was significantly higher among food insecure families compared to fully food secure families (Nackers & Appelhans, 2013). In a large sample (n = 409), only 7% of pregnant mothers reported meeting the recommended vegetable consumption and only 13% reported meeting the recommended fruit consumption.

Poor maternal diet intake and quality have been linked to pregnancy and fetal outcomes including excess gestational weight gain, pre-eclampsia, gestational diabetes and large for gestational age infants (Cox & Phelan, 2008; de Boo & Harding, 2006; DHHS, 2010; Herman et al., 2014). This association is exacerbated for low income women and taken together, the literature suggests that gestational weight gain is a primary concern and may serve as the instigating connection to the development of metabolic complications for both mother and infant.

Health complications related to gestational weight gain are compounded for women who enter pregnancy overweight or obese. Approximately 60% of overweight/obese pregnant women and nearly half of all women exceed Institute of Medicine (IOM) recommendations for gestational weight gain (GWG) in the U.S. (Brawarsky et al., 2005; Catalano, 2007; Chu, Callaghan, Bish, & D'Angelo, 2009).

Low-income women, in particular, and those who identify as ethnic/racial minority are more likely to be overweight or obese and often at highest risk of excess gestational weight gain (Metallinos-Katsaras, Siu, & Colchamiro, 2016; Paul, Graham, & Olson, 2013).

Life-course theory, with support from a growing body of literature contends that exposures to biological, physical, social, and behavioral factors influence health outcomes in mothers and their children (Kuh & Ben-Shlomo, 1997). Using this theory, it can be asserted that experiences related to low-socioeconomic status, especially food insecurity, can put pregnant women at risk of becoming overweight/obese prior to pregnancy, increase their risk of excessive gestational weight gain in pregnancy and subsequently lead to health complications such as gestational diabetes and hypertension (Finney-Rutten, Yaroch, Colón-Ramos, Johnson-Askew, & Story, 2010; M. C. Lu & Halfon, 2003; Pérez-Escamilla & Kac, 2013b; Yeung et al., 2010). Excess weight gain and its associated health complications can impact the health of the mother after pregnancy by increasing her risk of developing type II diabetes mellitus and weight retention throughout her life (Adamo et al., 2013; Li et al., 2013; Siega-Riz & Gray, 2013). Most concerning, life course theory with support from the Barker hypothesis, or the fetal origins of disease hypothesis, suggests that a maternal environment of obesity, excess gestational weight gain, and metabolic dysfunction can lead to excess adiposity and metabolic dysfunction in the infant (de Boo & Harding, 2006; Pérez-Escamilla & Kac, 2013b). Excess adiposity and dysfunction can lead to infants that grow into obese children and adults that are significantly at risk of developing diabetes, hypertension and

other metabolic complications in their own lifetime, ultimately continuing an intergenerational cycle of poor health (Chilton et al., 2009; de Boo & Harding, 2006; Herman et al., 2014; Mamun, Mannan, & Doi, 2014).

The U.S. Department of Health and Human Services states that life course theory should be used as a critical model in shaping research, policy and programs to reduce and/or prevent health disparities among low income women and children (DHHS, 2010). Targeting low-income women through a community provider like WIC can provide critical insight into the factors that put these women at risk of experiencing food insecurity, inadequate diet, and poor maternal and birth outcomes. Therefore, the objectives of this study were to: 1) Examine the relationship between home food environment (fruit and vegetable (F&V) availability), diet behavior (frequency of F&V intake), and food security status of pregnant WIC participants; 2) Examine the association between food security status and pregnancy outcomes (GWG); and 3) Examine association between food security status and birth outcomes (birth weight and gestational age or size for gestational age.

CHAPTER II

LITERATURE REVIEW

Food Insecurity

Food insecurity, the condition of inconsistent or uncertain availability of safe and nutritionally adequate food, is considered a major public health issue in the U.S (Gundersen, 2013; Hoefer & Curry, 2012). The Institute of Medicine (IOM) Workshop Report on food insecurity and obesity concluded that it is critical to address food insecurity in order to address health disparities and reduce the obesity rate among low-income people in the U.S. population (IOM, 2011). Food security is categorized into four levels by the United States Department of Agriculture (USDA) 1) food secure, 2) marginal food security, 3) low food security and, 4) very low food security. In marginal food security the head of household expresses anxiety or worry over food affordability, while at low food security, the household lacks the means to buy nutritious foods or a variety of higher quality foods. The most severe level, very low food security, comprises households who experience food shortage and hunger with reports of skipped meals (USDA, 2014). In the literature and according to the USDA, low to very low food security are often combined and referred to as—food insecurity. Food insecurity will be used interchangeably to represent low to very low levels of food security. (USDA, 2014).

Food security is typically measured in the U.S. using the United States Department of Agriculture's (USDA) 18-item U.S. Household Food Security Survey

Module (FS survey). This survey is divided into three stages (i.e. Household, Adult and Child) and enquires about the self-reported occurrence of different situations related to food shortage and access at both the household and individual level over a set period of time. The FS survey is administered by the U.S. Census Bureau as part of the Current Population Survey to measure state and national levels of food insecurity annually and is validated in the U.S. population (α = 0.743-0.856 for all households in a 12 month reference period and α = 0.789-0.356 for all households in a 30-day reference period) (Coleman-Jensen, Rabbitt, et al., 2015). The standard survey utilizes a 30-day or 1-year reference period to assess food insecurity.

The total score is calculated based on the number of affirmative responses to the 18 statements, such as, "did you or other adults in your household worry whether your food would run out before you got money to buy more." The total score ranging from 0 to 18, is then divided into the following four standard categories: 0 score: Food secure; 1–2 score: Marginal food security; 3–7 score: Low food security, and; 8–18 score: Very low food security. For households without children (individuals < 18 years of age), the final 8 child-referenced questions are omitted from the 18-item FS survey and final scoring is based on the first 10 items assessing the household and individual situation related to food affordability and access. The following standardized scoring categories are used for the 10-item survey: 0 score: Food secure; 1–2 score: Marginal food security; 3–5 low food security, and; 6–10 very low food security.

Food insecurity is reported by approximately 14% (17.4 million) of U.S. households with 5.6% or 6.9 million households reporting very low food security or

hunger. Food insecurity has been found to disproportionately impact households headed by a single mother (35%), those who identify as African American (26%) or Hispanic (22%), and those who are considered low-income (< 185 % of the poverty guideline) (34%; Coleman-Jensen, Rabbitt, et al., 2015).

Studies on low-income, and specifically those women participating in food assistance programs like WIC, have reported food insecurity rates from 27% to as high as 42% (Anding, Osborn, Gorman, & Murphy, 2001; Mathews, Morris, Schneider, & Goto, 2010). Women, who generally play the main role in managing the food budget and meal preparation, are consistently affected by the negative effects of marginal to very low levels of food security (Dinour, Bergen, & Yeh, 2007; Franklin et al., 2012; Larson & Story, 2011). Women from food insecure households are also more likely to choose and consume cheap high calorie foods over more nutritious foods like fruits and vegetables (Darmon & Drewnowski, 2015; Drewnowski & Specter, 2004). Following those findings, it is not surprising that large reviews of food insecurity literature indicate that food insecure women are also significantly more likely to be overweight or obese (Larson & Story, 2011).

Food Insecurity in Pregnancy

Perhaps most concerning, food insecurity has been found to be prevalent among pregnant low income women (Hromi-Fiedler, Bermúdez-Millán, Segura-Pérez, & Pérez-Escamilla, 2011; Ivers & Cullen, 2011; Laraia, Siega-Riz, & Gundersen, 2010; Laraia, Siega-Riz, Gundersen, & Dole, 2006). Low-income pregnant women, particularly of ethnic/racial minority may be at increased risk of experiencing food insecurity which has

been shown to have negative impacts on the health of the mother and child. Low-income women are significantly more likely to begin their pregnancy with an overweight/obese BMI. They are also more likely, especially if they begin pregnancy heavier, to gain excess weight in pregnancy and experience gestational diabetes and hypertension (Hromi-Fiedler et al., 2011; Laraia et al., 2010; Siega-Riz et al., 2009).

The effects of food insecurity on maternal health have been further associated with adverse birth outcomes. An epidemiological study by Carmichael, Shaw, Yang, Abrams, and Lammer (2007) indicated a significant positive relationship between food insecurity and certain birth defects such as cleft palate, spina bifida, and arterial malformations in the heart. Food insecurity in pregnancy can also lead to both over and under-nutrition for the growing fetus that ultimately impact both physical and cognitive development (Lee, Gundersen, Cook, Laraia, & Johnson, 2012). Specifically, it appears that food insecurity may be impacting maternal health outcomes and birth outcomes particularly infant size, through its effect on gestational weight gain. Food insecurity and the associated health risks of gestational weight gain on maternal and birth outcomes are explored further below review (see maternal outcomes, page 12 and Birth outcomes, page 15).

Home Food Environment

Home food environment may be indirectly associated with food insecurity in low-income women because what is available in the household may serve as a proxy or representation of what is accessible both environmentally and financially (Fulkerson et al., 2008; Nackers & Appelhans, 2013). In estimating an association between food

insecurity and home food environment, Kaiser et al. (2003) indicated that food insecurity was associated with lower availability and variety of foods, in particular fruits and vegetables, in low-income households. After controlling for maternal education, the availability of fruits among food insecure mothers was almost 50% less than food secure mothers. However, this study was conducted with only Latina immigrant mothers, limiting its generalizability to the wider U.S. population (Kaiser et al., 2003). Nackers and Appelhans collected home food inventories of 41 low-income families and compared their findings across the different levels of food security. Results of this study indicated that the availability of nutrient rich foods (fruits and vegetables) was significantly lower ($p < .05$) while the availability of calorie-dense or processed, packaged foods was significantly higher among marginal, low and very low food secure households ($p < .05$) compared to fully food secure families (Nackers & Appelhans, 2013).

Food insecure families tend to live in low-income neighborhoods, which are shown to have poor access to a variety and good quality of fruits and vegetables (Finney-Rutten et al., 2010; Nackers & Appelhans, 2013; Walker, Keane, & Burke, 2010). Studies indicate that even WIC Farmer's Market Nutrition Program (FMNP) vouchers are not used regularly by low-income women due to poor access to farmer's markets. Additionally, cost analyses indicate that fresh fruits and vegetables are more expensive than frozen and canned varieties. As a result, use of canned and frozen varieties, are often encouraged among low-income families. In addition to cost, a longer shelf life makes non-fresh or other forms of fruits and vegetables more desirable (Darmon & Drewnowski, 2015). An earlier study by Kendall, Olson, and Frongillo (1996) found that

food insecure households had lower mean availability of fruits (7.8) compared to food secure households (8.6). Especially in a situation of limited food budget, food insecure families may focus more on purchasing non-perishable, calorie dense foods that may be cheaper compared to low satiety, but more nutritious, foods such as fruits and vegetables. In addition, food insecurity has been associated with poor cooking skills and limited familiarity with fruits and vegetables (McLaughlin, Tarasuk, & Kreiger, 2003)

Studies on the role of home food environment indicate that it represents the proximal food availability for consumption and is a critical connector between external physical access to healthy, unprocessed foods such as fruits and vegetables and the actual dietary intake of these items (French, Shimotsu, Wall, & Gerlach, 2008; Fulkerson et al., 2008; Kegler et al., 2014).

Dietary Intake

Home food supply or the home food environment has been shown to influence diet quality for both children and adults (French et al., 2008; Nackers & Appelhans, 2013). When home food environment was studied in a sample of primarily African-American (n = 319) overweight/obese low-income women (non-pregnant), the findings suggested that home food environment is an important predictor in consumption of healthy and unhealthy foods. This study indicated that the availability of fruits and vegetables was significantly associated with intake of these items ($p < .001$), and availability of processed, packaged food was significantly associated with the intake of calories from fat ($p = .01$; Kegler et al., 2014).

Regardless of income, average intake of fruits and vegetables among adults in the U.S. is 1.1 times per day for fruit and 1.6 times per day for vegetables which unfortunately falls below the recommended 1.5-2 cups of fruit/day and 2-2.5 cups of vegetables/day by the USDA's MyPlate (Centers for Disease Control and Prevention [CDC], 2013b; USDA MyPlate, 2016).

In contrast to high food security, marginal to very low levels of food security are associated with lower diet quality including lower intake of fruits and vegetables (Kendall et al., 1996; Leung et al., 2014; Rose & Oliveira, 1997; Tarasuk, 2001). Results of a large study using NHANES data indicated that as food security worsened, dietary quality was negatively impacted including significant decreases ($p < 0.0001$) in daily vegetable intake (Leung et al., 2014). In a similar study, it was estimated that the intake of fruits and vegetables did not differ between food secure and insecure participants, however, the use of fat as a flavoring was more common among food insecure women (Mello et al., 2010).

Studies have found that many pregnant women fail to meet recommendations for fruit and vegetable consumption. In a large Australian study (n= 409), only 7% of pregnant mothers reported meeting the recommended vegetable consumption and only 13% reported meeting the recommended fruit consumption (Wen, Flood, Simpson, Rissel, & Baur, 2010). In this same sample 21% reported drinking ≥ 2 cups (500 ml) of soft drinks per day and 12% reported consuming > 2 meals or snacks from fast-food or takeout per week (Wen et al., 2010). The overall findings are concerning, as adequate intake of fruits and vegetables is critical to ensuring sufficient levels of various

micronutrients such as vitamin A, folic acid and iron are for healthy development of the fetus (Procter & Campbell, 2014). In a recent large review and meta-analysis of micronutrient adequacy for pregnant women in developed countries cited that folate, iron, and vitamin D intakes were consistently below nutrient recommendations in the U.S., United Kingdom, Canada, Australia, and Europe (Blumfield, Hure, MacDonald-Wicks, Smith, & Collins, 2013).

This poor dietary intake may be directly or indirectly related to low socioeconomic status that can be further implicated in poor health outcomes such as overweight/obesity among women and future mothers. The food insecurity obesity paradox suggests that households who experience uncertainty or limited access to nutritious foods will often employ coping strategies such as the purchase of more calorie dense foods like fats, and refined carbohydrates or purchasing similar low-cost fast food options. This focus on calorie-dense but nutrient poor foods often leads to weight gain (Alaimo, Olson, & Frongillo Jr., 2001; Dinour et al., 2007; Drewnowski & Darmon, 2005). Through the lens of this paradox, low-income and food insecure women are predisposed to begin their pregnancy overweight or obese, a situation that puts them at increased risk of gaining excess weight and subsequently experiencing health complications like diabetes and hypertension that can negatively impact birth outcomes.

Maternal Outcomes: The Implications of Gestational Weight Gain

With growing concern around the obesity epidemic and a greater percentage of women entering pregnancy overweight or obese, the Institute of Medicine (IOM) reviewed the role of gestational weight gain in predicting maternal and birth outcomes

including obesity risk among infants and children. The review indicated that weight gain during pregnancy appeared to be a major predictor for poor pregnancy outcomes including gestational diabetes, caesarean delivery and high infant birth weight (Rasmussen & Yaktine, 2009). Based on this evidence, the IOM revised its guidelines (2009) and re-defined the recommended weight gain by pre-pregnancy body mass index (BMI) categories (Rasmussen & Yaktine, 2009). These categories now include a specific and, relatively narrow, range of recommended weight gain for obese women compared to the original 1990 recommendations for women to gain "at least 15 lbs." without a stated upper limit (see Table 1).

Table 1

Institute of Medicine Guidelines for Weight Gain during Pregnancy[a]

Pre-Pregnancy BMI [b] Classification (BMI(kg/m^2))	Total Weight Gain Range (lbs.)
Underweight (< 18.5)	28–40
Normal weight (18.5–24.9)	25–35
Overweight (25.0–29.9)	15–25
Obese (≥ 30.0)	11–20

[a] Guidelines are for singleton pregnancies, Consult the Institute of Medicine for higher order births (American College of Obstetricians and Gynecologists [ACOG], 2013)
[b] BMI = Body Mass Index

Women who enter pregnancy overweight or obese (pre-gravid BMI) are at high risk of gaining excessive weight throughout their pregnancy and subsequently retaining that weight. In the U.S. approximately 60% of overweight/obese pregnant women and roughly half of all women exceed IOM recommendations for gestational weight gain

(GWG; Brawarsky et al., 2005; Catalano, 2007; Chu et al., 2009). Studies investigating the relationship between weight gain during pregnancy and post-partum weight status have found that roughly 25% of women with a normal pre-pregnancy BMI who gain more than 20kg (44 lbs) during pregnancy will move up one BMI category at 6 months post-partum (Nohr et al., 2008; Viswanathan et al., 2008). This increase in BMI leads to subsequent metabolic changes that put women at risk for chronic diseases and health complications including diabetes, hypertension, and dyslipidemia (Gaillard et al., 2013).

In light of the burgeoning obesity epidemic and the critical importance of gestational weight gain, the 2009 IOM report also called for more research investigating the role of socioeconomic, cultural, and environmental factors in predicting GWG, with specific recommendations to target those women at higher risk of not meeting the recommendations for weight gain during pregnancy. In a study of 810 mid to low-income women, food insecurity or limited access to nutritious food was associated with higher gestational weight gain and gestational diabetes mellitus (Laraia et al., 2010). In focus group discussions with low-income pregnant women participating in the Special Supplemental Nutrition Assistance Program for Women Infants and Children (WIC), women frequently cited family pressure to “eat for two” and minimal knowledge of appropriate weight gain goals during pregnancy, as two major barriers in meeting GWG recommendations (Herring et al., 2016).

Studies have found that low-income women (those living at ≤ 185% of the poverty guideline), were more likely to enter pregnancy overweight, gain more than the recommended amount of weight during pregnancy, and experience a higher risk of poor

health postpartum (Lederman, Alfasi, & Deckelbaum, 2002; Paul et al., 2013; Skouteris et al., 2010). In a sample of low-income, African American mothers, 64% of the total sample (across all BMI categories) gained excessive weight during pregnancy and among those women who were overweight or obese before pregnancy all gained above IOM recommendations (Lederman et al., 2002). A newly published study examining food insecurity in relation to gestational weight gain by Metallinos-Katsaras et al. (2016) examined a diverse sample (n = 10,844; 55% non-white) of pregnant women and found 30% food insecurity with 8% very low food security. The authors determined that overweight mothers with very low food security had higher GWG during their first pregnancy (an average of 38 lbs.) than those who were food secure (34 lbs., $p < .001$) or had low food security (35 lbs., $p < .01$; Metallinos-Katsaras et al., 2016). This study did not report on the relationship between food insecurity and gestational weight gain or birth outcomes.

Literature on obesity prevention indicates that pregnancy is a critical window of opportunity to prevent two generations of obesity and potentially stop the cycle of chronic disease.

Birth Outcomes

Higher pre-gravid BMIs have been shown to negatively impact neonatal outcomes including mortality, morbidity, preterm delivery, and infant size for gestational age (Abrams & Selvin, 1995; Chu et al., 2009; Gavard & Artal, 2014; Stotland, Cheng, Hopkins, & Caughey, 2006). In pregnancy many normal metabolic alterations occur, including a state of relative insulin resistance, an adaptive response that allows for more

efficient transfer of fuel across the placenta to the fetus (Guelinckx, Devlieger, Beckers, & Vansant, 2008). But for overweight and obese women (pre-pregnancy BMI), this insulin resistance is magnified, which dramatically elevates the risk of impaired glucose tolerance and development of gestational diabetes. These metabolic changes ultimately set up an "obesogenic environment" whereby fetal adiposity is increased, resulting in large for gestational age infants. The significantly altered metabolic milieu of growth factors, anabolic hormones and increased levels of glucose, lipids and amino acids seen in gestational diabetes can lead to fetal macrosomia (> 4,500 g) or Large for Gestational Age (LGA) infants and greatly increase the risk of birth complications. Animal models and human epidemiological studies strongly indicate that excessive weight gain in pregnancy related to excessive energy consumption and subsequent metabolic alterations (i.e. gestational diabetes) are correlated with higher birth weight and later obesity and metabolic dysfunction (type 2 diabetes) in the offspring (Ramey et al., 2015; Russ, Larson, Tullis, & Halfon, 2014; Viswanathan et al., 2008).

These intergenerational effects of gestational weight gain and its potential cofactor, food insecurity, suggest that pregnancy is a critical period in the health trajectory of mother and infant. The life course theoretical framework provides a support hypothesis that contextualizes the aims of this study.

Life Course Theory—A Framework

In development of my research questions, the life course theory was used to inform and develop the conceptual approach and subsequent study design for this project. The life course theory first developed by Kuh and Ben-Shlomo (1997) is a conceptual

framework that examines how individual health trajectories vary and asserts that patterns can be predicted for populations and communities based on social, economic and environmental exposures and experiences (LeBlanc, Kuhn, & Blaylock, 2005; Russ et al., 2014). The life course is viewed as an integrated continuum of exposures, experiences and interactions that intersect to influence the overall health of individuals and future generations. For example, food insecurity, a socio-economic experience, of food acquisition related anxiety, often results in limited quality and quantity of the diet. These dietary changes may then negatively impact the nutritional status of pregnant women leading to vitamin deficiencies and/or overconsumption of calorie-dense, nutrient-poor foods (e.g., fast food, packaged foods) resulting in excessive weight gain. This phenomenon, also conceptualized as part of the food-insecurity-obesity paradox, is well documented in the literature among women in the U.S. population (Dinour et al., 2007). The life-course framework along with Barker's developmental origins of disease hypothesis further posit that there are critical periods of development, particularly related to conception and prenatal development (de Boo & Harding, 2006). This suggests that if the health of the mother is impacted by a situation like food insecurity or poor nutritional status, then the health of her infant may be negatively altered, increasing the risk of birth complications and future health issues. The life course theory framework helps to contextualize the aims of this study by recognizing that food insecurity, as a socio-economic factor, may play a role in the life course for low-income women and critical periods of development for their infants in the short and long term. Specifically, it can be hypothesized with support from the literature described above, that food insecurity or

other socio-economic/demographic factors could impact maternal health through diet behavior, health complications, and/or outcomes such as gestational weight gain and birth weight of the infant. This model provides a strong framework to investigate the vast health disparities seen in pregnancy outcomes among low-income ethnic/racial minorities and supports the critical need to determine what factors put low-income pregnant women at risk of poor pregnancy and birth outcomes (M. C. Lu & Halfon, 2003; Ramey et al., 2015).

Research in Underserved Populations

Emerging literature indicates that the goal of reaching and studying low-income women is hard to achieve unless careful considerations are made to decrease social and logistical barriers for meaningful participation (Brannon et al., 2013; Heller et al., 2014). Clinical research has indicated that issues ranging from transportation, language barriers, lack of culturally relevant incentives, and unavailability of child care have prevented participation of people from poor socioeconomic backgrounds, particularly women and minorities (Heller et al., 2014). It has been noted that overall lack of trust and confidence in the health care system also prevent high-risk populations from participation in research studies (Blumenthal, Sung, Coates, Williams, & Liff, 1995; Bonner & Miles, 1997). This distrust along with a possible structural and procedural unfamiliarity with large medical centers or universities where research is generally conducted often deter low-income families from participating in research studies (Moreno-John et al., 2007; Nicholson et al., 2011; United States Department of Health and Human Services, 2002). Hence, partnering with organizations and community programs already working with the target

population, has been recommended (DeHaven, Hunter, Wilder, Walton, & Berry, 2004; Wallerstein & Duran, 2006; Wendler et al., 2006; Yancey, Ortega, & Kumanyika, 2006). In fact, community centers, public health programs, and religious centers closely connected with community members often serve as effective and valuable locations to recruit and implement health and nutrition interventions (Jordan et al., 2008; Rustad & Smith, 2013). Especially, in nutrition research, the Special Supplemental Nutrition program for Women, Infants, and Children or WIC—a federal food assistance program specifically targeting women and children living ≤ 185% federal poverty level, is considered a vital gatekeeper in reaching low-income, racial/ethnic women and families. However, time constraints of WIC staff and competing service demands have limited the ability and desire for the program to partner in research. The majority of WIC clinics have high client volume and appointments can include multiple lengthy elements such as determination of eligibility, lab and nutrition risk assessment, nutrition education, and voucher issuance. Research recruitment within these sites has often been on the periphery of the clinic with limited involvement of the agency staff where women are approached in crowded public waiting rooms that lack privacy and may discourage participation. Reaching low socio-economic clients via WIC has shown to be effective only when clinic staff are involved in the planning and execution of the study (Brannon et al., 2013; Chang, Brown, & Nitzke, 2009). In a longitudinal study of children participating in WIC, process results indicated that close communication and involvement of the WIC staff for initial planning of the recruitment strategies, were key in building an effective and successful partnership with the program (Brannon et al., 2013). Additionally, a

collaborative partnership with clinic staff has been found imperative in reducing participant burden in research studies and greatly enhancing participation rates (Brannon et al., 2013; Nicholson et al., 2011). However, the research describing specific successful recruitment and retention strategies for low-income pregnant women in health research is limited (Barnett, Aguilar, Brittner, & Bonuck, 2012; El-Khorazaty et al., 2007; Pletsch, Howe, & Tenney, 1995).

The Role of WIC

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), a major federally funded food assistance program, is designed to serve as one of the buffers against food insecurity for low-income (defined as up to 185% of the federal poverty level) priority subgroups such as pregnant women (Coleman-Jensen, Rabbitt, et al., 2015; Food and Nutrition Service, 2016). WIC served an average of 8 million participants at a rate of about $43 per person for the 2015 fiscal year (Food and Nutrition Service, 2016; Oliveira, 2014). WIC specifically reaches pregnant women, lactating mothers, infants and children ages five years and younger. It provides economic assistance in buying nutrient-dense foods by providing women and families with vouchers that can be used to purchase approved food items at authorized stores (Oliveira, 2014). Approved foods include 100% fruit juice, milk, whole grain breakfast cereal and bread, eggs, fruit and vegetables ($11.00 in cash value vouchers), legumes, and peanut butter (Food and Nutrition Service, 2016).

In a new position paper by the Academy of Nutrition and Dietetics on obesity and pregnancy outcomes calls for studies that address interventions that specifically target

pre- and peri-natal counseling and education programs on maintaining a healthy weight and appropriate weight gain in pregnancy (Stang & Huffman, 2016). Recent research suggests that women who are counseled by their clinicians on appropriate gestational weight gain and given recommendations for diet and lifestyle changes, are more likely to gain within the IOM guidelines (Kapadia et al., 2015; Ledoux, Van Patricia, Leung, & Berens, 2015). WIC currently provides programs like Centering Pregnancy, a peer support group which has been demonstrated to reduce excessive gestational weight gain and improve health outcomes (Tanner-Smith, Steinka-Fry, & Gesell, 2014). The WIC program structure also offers targeted nutrition education on appropriate diet and support and education for breastfeeding. Herman, Harrison, Afifi, and Jenks (2004) found that WIC participation actually cut the food insecurity rate in half for women receiving vouchers for one year over the course of their pregnancy. WIC and programs like it that act as health education and food assistance providers present key research and intervention points to address health disparities among low-income pregnant women that could ultimately improve maternal and child outcomes.

CHAPTER III

AN EXAMINATION OF COMMUNITY PARTNERSHIP, APPROACHES, AND STRATEGIES USED IN CONDUCTING NUTRITION AND FOOD SECURITY RESEARCH WITH LOW-INCOME PREGNANT WOMEN

This chapter is an article draft prepared for submission to the Women's Health Issues Journal.

Abstract

Background

Recruitment of low-income minority populations, particularly women, into health based research has faced challenges related to transportation, time and lack of child care. However, collaboration between the researchers and community based health providers to provide a space for research and enhance trust among participants may improve results.

Objectives

To describe recruitment and retention strategies used in a cross-sectional study examining food security, diet, and birth outcomes among low-income pregnant women. We outline development of the research partnership with the community WIC clinic, depict our integrated study design via flow model, and describe recruitment outcomes.

Study Design

Participants included WIC clients ≥ 18 years, in the second trimester of pregnancy. Recruitment and in-person interviews were integrated into a client's maternity

certification visit by taking advantage of wait times within the appointment. WIC staff collaborated throughout the process in development of recruitment schedules, and strategies. WIC staff first introduced the study to clients.

Results

In total, 198 women were recruited and consented to participation over seven months. The retention rate for the second telephone interview was 87%. Recruitment and retention strategies included: introduction of the study by the WIC staff; two-staged incentives; multiple reminders to the participants; and conducting interview during the participants' wait time during the original recertification appointment.

Conclusion

Early collaboration and constant communication with the WIC staff for their input were critical in building an effective partnership. WIC staff played a key role in building trust and establishing rapport between clients and research staff.

Introduction

Food insecurity (FI), which refers to condition of limited access to nutritionally adequate and safe foods in socially desirable ways, is a major public health issue in the U.S. (Coleman-Jensen, Gregory, & Rabbitt, 2015; Gundersen, 2013; Hoefer & Curry, 2012). FI, ranging from mild (anxiety related to food affordability) to severe levels (food shortage and disrupted eating patterns), was experienced by 17.4 million U.S. households in 2014 (Coleman-Jensen, Rabbitt, et al., 2015). Low-income families, in particular are at higher risk of experiencing food insecurity. Compared to the overall national rate of 14%, 34% of low-income households experienced food insecurity in 2014 (Coleman-Jensen,

Rabbitt, et al., 2015). This high rate of food insecurity among low-income families and individuals is considered one of the major causes of health disparities in the U.S. (Gundersen, 2013; Hoefer & Curry, 2012). It is seen that poverty, food insecurity, and obesity often co-exist. This combination, referred to as the food insecurity-obesity paradox, is found very commonly among low-income ethnic/minority women in the U.S. (Dinour et al., 2007). The disproportionate burden of food insecurity and obesity among low income women of ethnic and racial minority has been considered a priority health concern by major U.S. organizations such as the National Institute of Health (NIH) and the CDC (IOM, 2011).

Pregnancy is considered a critical stage of health and development because health and weight status during this phase can affect both mother and child in the short and long term. The life-course theory of obesity risk indicates that pre-pregnancy body mass index (BMI) and weight gain during pregnancy predict birth weight and weight gain trajectory among children (Pérez-Escamilla & Kac, 2013a). Low-income women of ethnic/racial minority groups often have greater pre-pregnancy weight, postpartum weight retention, calorie intake and often participate in less physical activity in the postpartum period (Davis & Olson, 2009; Linné, Barkeling, & Rössner, 2002; Olson, Strawderman, Hinton, & Pearson, 2003). Hence, reaching low-income, racial/ethnic minority pregnant women, who are at a higher risk of gaining excess weight during pregnancy, has become an imperative in addressing both the adult and childhood obesity epidemics in this country. In consideration of the higher birth rate and increased prevalence of food insecurity

among women from low-income, racial/ethnic groups, research on understanding the effect of food insecurity on pregnancy outcomes among them has become necessary.

Emerging literature indicates that the goal of reaching and studying low-income women is hard to achieve unless careful considerations are made to decrease social and logistical barriers for meaningful participation (Brannon et al., 2013; Heller et al., 2014). Clinical research has indicated that issues ranging from transportation, language barriers, lack of culturally relevant incentives, and unavailability of child care have prevented participation of people from poor socioeconomic backgrounds, particularly women and minorities (Heller et al., 2014). It has been noted that overall lack of trust and confidence in the health care system also prevent high-risk populations from participation in research studies (Blumenthal et al., 1995; Bonner & Miles, 1997). This distrust along with a possible structural and procedural unfamiliarity with large medical centers or universities where research is generally conducted often deter low-income families from participating in research studies (Moreno-John et al., 2007; Nicholson et al., 2011; U.S. Department of Health and Human Services, 2002). Hence, partnering with organizations and community programs already working with the target population, has been recommended (DeHaven et al., 2004; Wallerstein & Duran, 2006; Wendler et al., 2006; Yancey et al., 2006). In fact, community centers, public health programs, and religious centers closely connected with community members often serve as effective and valuable locations to recruit and implement health and nutrition interventions (Jordan et al., 2008; Rustad & Smith, 2013). Especially in nutrition research, the Special Supplemental Nutrition program for Women, Infants, and Children or WIC—a federal food assistance program specifically targeting

women and children living ≤ 185% federal poverty level, is considered a vital gatekeeper in reaching low-income, racial/ethnic women and families. However, time constraints of WIC staff and competing service demands have limited the ability and desire for the program to partner in research. The majority of WIC clinics have high client volume and appointments can include multiple lengthy elements such as determination of eligibility, lab and nutrition risk assessment, nutrition education, and voucher issuance. Research recruitment within these sites has often been on the periphery of the clinic with limited involvement of the agency staff where women are approached in crowded public waiting rooms that lack privacy and may discourage participation. Reaching low socio-economic clients via WIC has shown to be effective only when clinic staff are involved in the planning and execution of the study (Brannon et al., 2013; Chang et al., 2009). In a longitudinal study of children participating in WIC, process results indicated that close communication and involvement of the WIC staff for initial planning of the recruitment strategies, were key in building an effective and successful partnership with the program (Brannon et al., 2013). Additionally, a collaborative partnership with clinic staff has been found imperative in reducing participant burden in research studies and greatly enhancing participation rates (Brannon et al., 2013; Nicholson et al., 2011). However, the research describing specific successful recruitment and retention strategies for low-income pregnant women in health research is limited (Barnett et al., 2012; El-Khorazaty et al., 2007; Pletsch et al., 1995). Therefore, the purpose of this paper is to add to a limited body of literature on: (a) the process of building a partnership with the program serving low-income women, such as WIC; and (b) describe what integrated and collaborative,

recruitment strategies are critical to conduct a study with low-income pregnant women involving multiple data collection points. Additionally, this paper presents resources, strategies, and materials used to streamline and standardize recruitment procedures and the data collection process.

Methods

Brief Overview of Study Procedure

To meet the main study goal of understanding the relationship between food insecurity and pregnancy outcomes including total weight gain during pregnancy, pregnant women attending a WIC clinic were recruited if they met the following selection criteria: (a) receiving WIC for themselves as a maternity client, (b) 18 years or older, and (c) in the second trimester of pregnancy. The second trimester of pregnancy was defined as 13 to 27 weeks of pregnancy (± 2 weeks). Upon recruitment, participants were asked to provide written consent to participate in a three part data collection process: I) 45- to 60-minute in-person interview using a close-ended questionnaire at the WIC clinic; II) 15- to 25-minute telephone interview for a second multiple pass 24-hour diet recall approximately two weeks after the initial interview; and III) a review of pre- and post-natal records after delivery to extract gestational age, total maternal weight gain during pregnancy, and birth weight of newborn. In compliance with policies for conducting research within WIC organizations in North Carolina, study approval at the county level and Institutional Review Board (IRB) approval from the participating universities were obtained.

Under the main goal of the study, information on food insecurity and dietary choices was collected from the study participants and information on pregnancy outcomes including rate of weight gain during pregnancy, gestational age, and birth weight of the baby were collected from medical records. Recruitment was conducted during WIC maternity certification visits. Upon meeting the study criteria and providing written consent, in person interviews were conducted using a structured questionnaire with the following sections: (a) socio-demographics; (b) food security; and (c) health status. Within this interview, the initial multiple pass 24-hour diet recall was also conducted using paper and pencil format to assess a typical week day. After completion of the interview, participants were given a $25 Wal-Mart gift card as an incentive. At this time, a second telephone interview was scheduled in order to collect the second multiple pass 24-hour diet recall (to represent a typical weekend day). After completion of the second recall, women could pick up a second $15 gift card in the WIC clinic. In the end, research staff worked with public health department staff to review the pre- and post-natal records of each participant after delivery to collect total maternal weight gain during pregnancy, gestational age, and birth weight of newborn.

Establishing Research Collaboration with WIC

In the months leading up to the completion of the grant proposal, the WIC director and county staff were involved in communication with the Principal Investigator (PI). In the proposal development phase, the PI made presentations to explain the study design, goals and potential timeline of the study. The presentations were followed by a discussion to refine the study goals and protocols with the suggested possibility of

conducting the study within the WIC clinic. The decision to conduct the study within the WIC clinic was agreed upon under the assumption that WIC staff would be consulted before finalizing any recruitment and study protocol plans pertaining to staff schedule, work load and use of WIC office space. Staff were assured that extra efforts would be taken to ensure that daily tasks and routines were not disrupted. The partnership was based on the mutual interests in addressing food insecurity and promoting health among low-income and underserved families. The WIC clinic provided the support letter for the grant submission confirming the partnership and access to WIC facility to recruit and conduct the study with pregnant women enrolled in their program. As part of this partnership, it is important to note that incentives were also written into the grant to provide needed supplies to the WIC clinic. Upon receipt of the grant, a two-day meeting was set with the WIC staff to review the three data collection points and discuss who in the WIC staff would or could be involved and in what capacity. During this meeting, the timeline was discussed and finalized and the research team involving graduate students, and the community health worker, were introduced to the program staff.

Preliminary Assessments

Demographic assessment. Based on the program report and discussion with staff, it was found that the majority of the clients of the study clinics were African-American, and approximately 20% were Hispanic/Latinas. Each month approximately 40 women (10 women per week), generally in the first or early second trimester, were enrolled in the program at one of the two WIC clinics in the county via a maternity certification appointment. Based on the availability of the WIC staff, empty offices and

locked space to store data, the WIC staff recommended the research team to establish base and focus at the main clinic which saw 2/3 of all WIC clients for the county.

Formative assessment of the WIC staff, clinic, and its functions. A formative assessment was conducted to determine the physical layout of the target WIC clinic, and the timing, details, and key components of a maternity certification visit. Several questions were considered in this process such as: what spaces in the clinic were used at what times; how many new maternity clients were seen per week; which staff did they work with at what times; what was the typical process for a maternity certification visit and how long did this take; what were the procedures and protocols for Spanish speaking clients. With these questions in mind, several observations of WIC clinic appointments were made including key informant interviews with WIC nutrition counselors and any other staff who were noted to work directly with clients. The purpose of these interviews was to understand the role of each staff member in providing services to pregnant WIC clients and to understand the unique needs of this client population and how these factors might impact participation in the study. The physical assessment of the clinic was carried out to identify the 'route' and timing each client followed during the appointment and determine if and how the research team could physically and temporally position themselves in the clinic for recruitment.

Results

Based on the findings from the preliminary formative assessment, the following points were summarized and the client route was created (see Figure 1):

1. All maternity certification appointments were conducted on Tuesday afternoons (1 pm – 4 pm) and Thursday mornings (8 am – 12 pm).
2. All Hispanic/Latina certifications were completed together, as a group, on Friday mornings (8 am – 12 pm), due to limited availability of interpreters.
3. For each maternity certification visit, a woman would need to be reviewed for WIC eligibility, have her height and weight taken (step 3, Figure 1), blood drawn to check her iron status (step 6, Figure 1), meet with a nutritionist (step 5, Figure 1), and meet with a breastfeeding (BF) counselor (step 7, Figure 1), all before she could pick up her vouchers (step 9, Figure 1).
4. If the woman was a new client or had never received WIC before, she would also have to go to a classroom for a brief educational video, and instruction on the use of her vouchers. This would constitute another step in the visit (step 8a, Figure 1). If she was familiar with the use of vouchers, she would go back to the waiting room to wait for her vouchers (step 8b, Figure 1).
5. Between each element of the visit, 10- to 30-minute wait times were observed, adding to more than 60 minutes of wait time in itself. Referring to Figure 1, there was a 10- to 20-minute waiting time between step 5 (nutritionist in cubicles) and 6 (lab) and a 15- to 30-minute wait time between steps 6 (lab) and 7 (breastfeeding counselor). Additionally, the longest wait time of 30 minutes was expected between step 7 (breastfeeding counselor) and step 9 (voucher pick-up and check out; in Figure 1). Based on this assessment, it was determined that a 45- to 60-minute interview could be conducted within the

maternity certification appointment instead of setting up a separate time for the first in-person interview. As shown in Figure 1, the client route indicated that pregnant women would be visiting four to five stations/cubicles on the same floor with a significant waiting time ranging from 10 to 30 minutes between each station. Overall, the combination of recertification steps and subsequent wait times culminated in an approximately two-hour total appointment time for each maternity client.

Figure 1. Layout of WIC Clinic and Sequence of WIC Maternity Certification Appointments. Each number corresponds to an element (step) of the appointment or where the research staff was able to integrate the research study processes.

WIC Appointment Element	Integration Point by Study Staff
Step 1-2) WIC client checks in and waits to be called back.	
Step 3) Client's height and weight is taken and her folder is then placed in a nutritionist box (step 4).	**Step 4)** A research study assistant checks the waiting folders to determine eligibility of each incoming client. A flyer is placed in the folder of those who meet eligibility criteria to flag the nutritionist/ breastfeeding counselor.
Step 5) Client meets with nutritionist (cubicles)—she informs them of their eligibility and asks if they would like to meet study recruitment staff. A breastfeeding counselor may see the client before the nutritionist (see Steps 7).	**Step 5A)** Eligible women who indicated interest in the study are then routed to the study recruitment office to meet study staff. **Step 5B)** Interested participants provide informed consent and are directed to an interview room or their appointment is scheduled out.
Step 6) Client goes to lab to have her blood drawn to determine iron status.	
Step 7) Client meets with breastfeeding counselor.	**Step 7A-B)** Clients follows same pattern as 5A-5B but routing is initiated by breastfeeding counselor.
Step 8) Client is directed to waiting room to wait for her WIC supplement vouchers or if she is new to WIC services, she will wait in the classroom.	**NOTE**: Clients participating in the study would be able to pause and finish the remaining elements of their WIC appointment or upon completion of the study, would be routed to the next element of the appointment or directed to the waiting room by study staff
Step 9) Clients receive their vouchers and check out.	

Figure 1. Cont.

Recruitment Strategies

The formative assessments of the program, and staff interviews were used to establish recruitment and data collection plans for the study. For recruitment, a mix of active and passive strategies, were implemented. Potential participants were first exposed to the study information via a passive method of posting fliers in the waiting rooms and lobby of the clinic. In the key informant interviews with WIC personnel, they expressed the desire to play an active part of the research process and it was observed that breastfeeding and nutrition counselors spent longer periods of time with clients than any other staff during the recertification visit. Therefore, an active recruitment strategy was employed whereby breastfeeding and nutritional counselors provided the study flier to eligible women and briefly explained the key steps involved in the study. To streamline this process and minimize staff burden, the research staff independently reviewed appointment folders at the beginning of the day to determine study eligibility for any scheduled maternity clients. Upon meeting eligibility, a study flier was inserted in the folder to flag WIC staff that the client was eligible for the study. In the beginning of the counseling session with a client, the staff member then provided brief information about the study and asked the client if she was interested in speaking to research staff for recruitment. Upon interest, at the end of the counseling session, WIC staff directed clients to the 'research area' or designated office where research staff were located. Thus, the WIC staff time commitment was minimized to approximately five minutes. The decision to have WIC staff introduce the study to maternity clients served two purposes: (a) clients would learn about the study opportunity from a trusted source which could improve

likelihood of participation (Wallerstein & Duran, 2006); and (b) give clients an "easy out" if they did not want to talk to research team. Upon recruitment, women were given the option to complete their interviews in-between the waiting times of the current maternity certification appointment or schedule out the appointment for another day that week. Most of the interviews (80%) were completed during the recertification visit in-between wait times. Even the later scheduled appointments were conducted in the same location of the main floor of the WIC clinic (see Figure1).

Integration of the research process into WIC processes. The integration of the first in-person interview during the wait times of the usual WIC maternity certification appointment was further streamlined by having study recruitment and interviewing rooms located in the midst of the WIC clinic (Figure 1). WIC allowed the research team use of one small conference room for recruitment (informed consent process), and two offices for interviews including in-person and telephone interviews. These interview spaces were centrally located to give the staff easy access to the client if they needed them to move to the next step of the certification process. These private interview rooms also provided a contained space for children. Coloring books, crayons, and small toys were made available help occupy any children present. WIC staff were given priority and were allowed to interrupt the study interview to conduct part of the WIC client's visit, returning them to the interview room once finished. This was done so as to not increase the participant's appointment time and reduce interference for the WIC staff duties.

Maintaining the Partnership and Communication

In order to prevent any miscommunication and disruption between the research team and WIC staff, the PI and lead grad student attended all monthly WIC staff meetings to give a study update and ask for questions, concerns or recommendations. The PI also checked-in weekly with both staff and supervisors to identify hitches and remedies. Protocol was changed after the initial meetings illuminated hitches in the process. For example, once a participant agreed to do an interview there on site, we discovered that we would need to let everyone (BF counselors, front desk staff, lab staff) know where she was so she could be retrieved for the subsequent parts of her WIC certification appointment. This was done by way of a white board in the main office where participant name and room location was posted.

Retention Efforts

After finishing the first in-person interviews, a time was set up for a second 24-hour recall over the telephone. WIC staff reported that a client's number could change from one week to the next and even they would have trouble reaching the client for appointments. Based on the suggestions of the WIC staff, both, pre-emptive and back-end strategies were implemented to maintain contact and motivation among WIC participants. Pre-emptive strategies included asking participants in the initial interview what times would be best to call them on a Sunday or Monday in next one or two weeks and if they would like a telephone text message reminding them about the second recall. Participants were asked for any alternative phone numbers where the research team can reach them if that primary phone did not work. Participants were also given a "Next steps" card at the

end of the initial interview reminding them they would be called for the second recall and how to go about getting their second gift-card as an incentive after completing the telephone interview (see Figure 2).

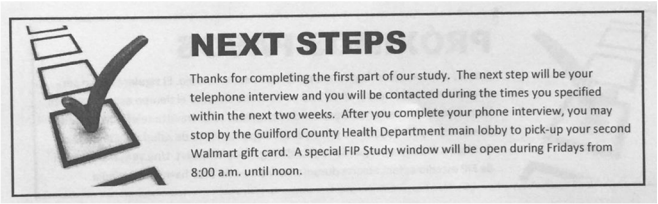


Figure 2. Next Steps Card. This card was provided to participants as a reminder for their follow-up appointment for their second 24-hour diet recall. Participants were also asked for their preferred dates and times to be contacted. The Spanish translation was printed on the back.

Back-end strategies included reminder calls or texts, and contact within one week to initiate the second 24-hour diet recall. The premise of these strategies was to maintain contact and reduce the length of time between the initial interview and the second phone interview to maintain familiarity and ultimately reduce attrition. Additionally, if phone numbers changed or were no longer working, research staff checked with WIC front desk staff to see if a new number was on file, and if not, research staff attempted contact through the alternate phone number acquired in the initial interview. As a last resort, a letter was mailed to the participant's address letting her know that the research team was trying to reach her. On average, participants were sent text reminders once before the initial interview (if it was scheduled out) and twice for the second 24-hour diet recall over the telephone. More than half of the participants (65%) completed the telephone recall at

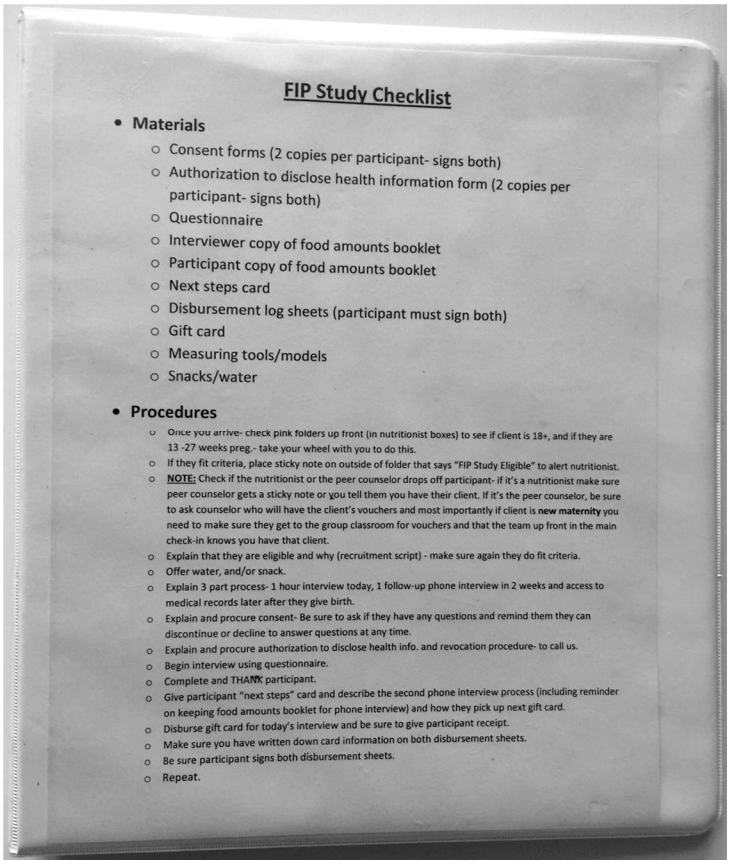
the first attempt, however the remaining 35% of telephone interviews were rescheduled an average of two times with telephone recalls being conducted 2–6 weeks after the initial interview. A second incentive, a $15 gift card, was used to encourage participants to complete the second 24-hour diet recall over the telephone in a timely manner. Upon completion of the telephone recall, participants were asked to pick up their second gift card at the WIC office.

Research Team, Training, and Use of Materials for Co-ordination

A fulltime doctoral student was supported under this grant as a research assistant and acted as a lead coordinator for the study. In addition, the team involved eight graduate students receiving research course credit ranging from one to three credit hours. These graduate assistants helped with in-person (three students) and telephone interviews (three students) and also assisted in data entry and quality control checks (two students). Besides the team of graduate students, one part-time paid bilingual community interviewer fluent in English and Spanish was hired to specifically communicate and interview Hispanic/Latino participants. All the team members received training and interviewing techniques using role playing, review of questionnaire and protocol, and pilot-testing. However, graduate assistants were assigned their roles and responsibilities within the study based on previous work experience, training, observation, and subsequent evaluation of their skills/strengths. Students were assigned one or more roles which included: recruiter, interviewer, 24-hour diet recalls (telephone), data entry, and manning a pick-up window (for second gift card). To maintain consistency in quality and implementation of standardized research protocol, re-training, updates, quality control

checks, and team meetings were held regularly on a weekly basis. Along with the interviews, the study coordinator or lead doctoral student was stationed in the clinic daily to conduct recruitment and day to day communication with WIC staff including routing of the participants to interview rooms (if they wanted to begin during their WIC visit).

In order to ensure all the research steps were implemented consistently in the right order, binders were prepared for each interview research assistant and refilled for each interview. As shown in Figure 3, each binder contained a checklist of all necessary materials and procedures for each interview (front cover).



FIP Study Checklist

- **Materials**
  - Consent forms (2 copies per participant- signs both)
  - Authorization to disclose health information form (2 copies per participant- signs both)
  - Questionnaire
  - Interviewer copy of food amounts booklet
  - Participant copy of food amounts booklet
  - Next steps card
  - Disbursement log sheets (participant must sign both)
  - Gift card
  - Measuring tools/models
  - Snacks/water
- **Procedures**
  - Once you arrive- check pink folders up front (in nutritionist boxes) to see if client is 18+, and if they are 13 -27 weeks preg.- take your wheel with you to do this.
  - If they fit criteria, place sticky note on outside of folder that says "FIP Study Eligible" to alert nutritionist.
  - **NOTE:** Check if the nutritionist or the peer counselor drops off participant- if it's a nutritionist make sure peer counselor gets a sticky note or you tell them you have their client. If it's the peer counselor, be sure to ask counselor who will have the client's vouchers and most importantly if client is **new maternity** you need to make sure they get to the group classroom for vouchers and that the team up front in the main check-in knows you have that client.
  - Explain that they are eligible and why (recruitment script) - make sure again they do fit criteria.
  - Offer water, and/or snack.
  - Explain 3 part process- 1 hour interview today, 1 follow-up phone interview in 2 weeks and access to medical records later after they give birth.
  - Explain and procure consent- Be sure to ask if they have any questions and remind them they can discontinue or decline to answer questions at any time.
  - Explain and procure authorization to disclose health info. and revocation procedure- to call us.
  - Begin interview using questionnaire.
  - Complete and THANK participant.
  - Give participant "next steps" card and describe the second phone interview process (including reminder on keeping food amounts booklet for phone interview) and how they pick up next gift card.
  - Disburse gift card for today's interview and be sure to give participant receipt.
  - Make sure you have written down card information on both disbursement sheets.
  - Be sure participant signs both disbursement sheets.
  - Repeat.

Figure 3. Materials and Procedures Checklist. This checklist was placed in the front panel of each interview binder as a prompt and reminder for interviewers conducting this study.

Two copies (one for participant, one for research files) of consent, HIPAA, and study information forms were all placed in the front pocket with highlighted areas for required signatures. Interview questionnaires were contained in the binder rings. Disbursement signature sheets for gift cards and "next steps" cards outlining the second 24-hour telephone recall were placed in the back pocket to be completed at the end of the interview.

Participation Outcomes

A total of 198 WIC pregnant women were recruited over the span of approximately seven months. All of the 198 women (100%) completed the first interview and 87% completed the second telephone interview for the second 24-hour diet recall. Of the 198 initial cases, we were able to retrieve the medical records of 87% of participants in coordination with the WIC staff. Over the course of the study, average maternity enrollment at the WIC clinic was approximately 10 cases per week. Of those 10 cases per week, roughly 70% met the study criteria and were successfully recruited into the study. On average, seven interviews were carried out per week and most interviews (80%) were carried out immediately following recruitment within the wait times of the WIC maternity appointment. For another 1 to 2 participants per week, an appointment was scheduled out. The ethnic and racial makeup of the sample closely reflected the client characteristics of the target WIC clinic where 51% were African American, 18% were Hispanic/Latino, 12% represented other nationalities such as Southeast Asian, and the remaining participants were non-Hispanic white participants (19%).

Discussion

Findings from community based research projects with low-income populations suggest that a relationship between the academic institution and target community agency based on mutual respect for time, resources, and staffing constraints is critical to facilitate the research project and ensure its success (Branson, Davis, & Butler, 2007; R. M. Davis et al., 2009; Loftin, Barnett, Bunn, & Sullivan, 2005; Nelson, 2002). Building a strong partnership with the WIC clinic organization and staff was integral to the success of this project. Open engagement with staff ensured that issues were identified and corrected quickly with little disruption to clinic flow or research processes. Weekly and monthly meetings with WIC staff fostered trust and secured their support of the study. Similar to our study, Brannon et al. (2013) formed a partnership with WIC to recruit low-income, minority families for a longitudinal study. They too reported that their mutual interests in promoting health among low-income families and a strong collaborative relationship with WIC staff from beginning to end was critical to successful completion of their study (Brannon et al., 2013). The results of our study and others indicate that the most effective method for recruitment of women from low-income and/or ethnic/racial minority backgrounds is to collaborate closely with community based programs that serve them.

Our high recruitment rate and successful completion of the study in the set funding timeline (one year) indicates that face-to-face recruitment and involvement of WIC staff in introducing the study are effective strategies in conducting research with minority populations. Studies utilizing similar in-person recruitment techniques have demonstrated recruitment rates of 90% (El-Khorazaty et al., 2007). WIC staff are able to

act as bridge between the research project and potential participants because they often already have a rapport with their clients.

Our retention rate of 87% was comparable to retention rates of 49 to 60% in similar studies targeting low-income, racial/ethnic minority population groups (Brannon et al., 2013; Chang et al., 2009). Retention strategies in our study included text or phone call reminders for scheduled appointments along with the provision of a "next steps" card which informed the participant that she would be contacted in a few weeks for her second 24-hour recall over the telephone. Having participants provide alternate phone numbers likely contributed to a high retention rate (87%) for the second 24-hour diet recall in this study. Results of this and previous studies have suggested that a combination of strategies, such as consistent contacts with study participants along with several or staged incentives, have been critical for high retention rates. In Project DC-HOPE, a behavioral intervention for African American pregnant women, the high, (79%) retention rate, was attributed to several reminders and consistent contact with the participants (El-Khorazaty et al., 2007). In a study of low-income mothers, retention rates of 59% were seen 10 weeks post-intervention. Authors attributed this rate to using multiple retention methods such as: (a) getting at least two phone numbers, and (b) providing small incentives to participants for updating their contact information (Chang et al., 2009). Similarly, in our study, a two stage incentive model ($25 for first interview and $15 for second 24-hour recall) was integral to ensuring completion of the remaining study components.

A growing body of literature on implementation research indicates that the goal of reaching traditionally underserved population cannot be achieved unless extra efforts are

made to decrease logistical barriers to participation. Key barriers cited in research with low-income individuals, ethnic minorities and WIC participants specifically relate to transportation, time constraints and lack of childcare (Brannon et al., 2013; Heller et al., 2014; Woelfel et al., 2004). To minimize transportation barriers, Brannon et al. (2013) offered a two-way taxi service to participants for each study visit. Additionally participants were allowed and encouraged to bring their children who were provided with lunch and activities, while mothers participated in the study (Brannon et al., 2013). Similarly, we used an appointment integrated design of interviewing participants during their WIC maternity certification visit to reduce time constraints and the transportation barriers associated with scheduling out a separate appointment. In addition to logistical barriers, implicit attitudinal barriers due to mistrust and differentiation, can also act as road blocks to reach and build rapport with low-income women (Kennedy et al., 2010). Strategies such as diversity training for research staff and introduction of the study by trusted sources such as community health workers or public health programs have been found to be effective (Brannon et al., 2013; Chang et al., 2009; Nicholson et al., 2011). In our previous research with refugees and immigrants, we found that using community health interviewers or trained individuals from the community of interest was critical in reaching and building trust with the study groups (reference excluded for blind review). The results of the process evaluation indicated that community health workers were critical in improving cultural competency of the study and ensuring collection of in-depth family and health related information from the participants. As in our study, the strategy of involving program staff to introduce the study has been demonstrated to be one of the

critical strategies in reaching low-income, minority groups. However, our study and others who have partnered with WIC clinic staff have demonstrated that careful planning and streamlining of the recruitment process is critical to procure support from WIC staff and ensure that their participation in the research process does not interfere with their work responsibilities or clinic flow (Chamberlin, Sherman, Jain, Powers, & Whitaker, 2002; El-Khorazaty et al., 2007). To limit staff burden, our research staff reviewed appointment files at the beginning of the day and determined study eligibility before WIC staff met with clients. Study recruitment fliers would be placed into eligible client's folders to flag WIC staff, thus eliminating any guessing or question for the WIC staff before addressing her as a potential participant.

This study was able to recruit a fairly large number of Spanish speaking participants. However, many barriers existed that may have limited our ability to reach those who are most vulnerable to food insecurity. Roughly 2/3 of the Spanish speaking sample in this study were bi-lingual and could be interviewed in either English or Spanish. Being bi-lingual, might improve their ability to procure employment and better navigate U.S. social service programs that improve food security status. Those who speak no English or have limited acculturation (linguistically) may be more vulnerable to food insecurity. Finding bi-lingual community interviewers is extremely difficult in community research. The WIC clinic in this study even struggled to have bi-lingual staff to complete their own appointments. Future studies must seek to include more bi-lingual interviewers to ensure that Spanish speakers are better represented in community research.

Feasibility

This study had several resources available to complete the study according to the timeline and the successful recruitment within that period must be considered in light of this. First, this study was funded by a large grant, which allowed for incentives for the WIC clinic and a total of $40 in incentives for each participant. Secondly, this study was able to have a full-time doctoral student and 8 research assistants devoted to data collection and entry. While, these resources may not be available to many other studies, other strategies employed in this study can be used to increase recruitment. Specifically, working closely with the WIC clinic and tailoring the needs the study to fit within the clinic processes, can be helpful. It is important to note that not all WIC or community clinics can or will be as amenable to this integrated process. Each research group will have to consider their own community partnership relationships and the specific needs of the partnering agency.

Conclusions and Implications

Health-based research studies for low-income, racial/ethnic minority groups should be designed to include strategies that decrease barriers to research participation and tailor the research process to the unique needs of the target population and potential partnering agency. This research project was able to recruit and consent 198 participants in seven months in a busy community based provider clinic, due to close partnership with the WIC program and careful planning and consideration of staff needs. Taking advantage of the time that participants already had to spend waiting for their maternity certification appointment, effectively eliminated time and transportation barriers. The

efficiency and success of this study are wholly attributed to the unique integration of the research process into WIC appointments for an under-studied population of low-income pregnant women. The methods employed in this study might be further used and adapted to fit the needs of other studies and their partnering agencies. Community based participatory research strategies such as those used in this study can move the health and nutrition field forward by meeting the community and the public health agencies that serve them where they are rather than asking them to conform to the research process. Strong collaborations with program staff, serve to acknowledge the value and contributions that public health agencies can provide to their communities. This collaboration along with appropriate research staff training and materials, were critical in the success of reaching and meeting the recruitment goal for this study.

Funding

Funding was provided by the NCTRACS 550KR51303 grant under the National Center for Advancing Translational Sciences-NIH Grant #1UL1TR001111. There are no conflicts of interest to disclose related to the role of the researchers or the funders.

CHAPTER IV

FOOD INSECURITY: HOW IT AFFECTS HOME AVAILABILITY AND INTAKE OF FRUITS AND VEGETABLES AMONG WIC PREGNANT WOMEN

This chapter is an article draft prepared for submission to the Journal of the Academy of Nutrition and Dietetics

Abstract

Background

Low to very low food security levels, often referred as food insecurity, is positively associated with a poor home food environment and diet quality. However, inter-relationship between these three variables is not clear.

Objectives

Objectives were to (a) Determine the differences in home availability of fruits and vegetables by food security levels; and (b) Examine the inter-relationship between food security, availability of fruits and vegetables at home and frequency of their respective intake.

Design

The design of this study was a cross-sectional survey interview with the WIC pregnant women.

Participants/Setting

Pregnant women (n = 198) were interviewed if they were: ≥ 18 years of age, in second trimester of pregnancy, receiving WIC benefits, and speaking English or Spanish.

Main Outcome Measures

Food security status was measured using the 18-Item U.S. Household Food Security Survey Module. The 2013 Behavioral Risk Factor Surveillance Survey's Fruit and Vegetable module was used to measure the frequency of consumption of fruits and vegetables. Home availability of fruits and vegetables was measured using a self-report inventory of commonly eaten fruits and vegetables in U.S. households.

Statistical Analyses Performed

Descriptive statistics, Chi-Square, and One-Way ANOVA were conducted using SPSS v. 17. Mediation model testing was conducted using Mplus v.7.31.

Results

Food insecurity was found among 43% of participants. Availability of variety of fruits decreased with decrease in food security ($F_{(3,197)} = 3.12$, $p = .028$). The mediation analysis indicated that food security status indirectly affected daily fruit and vegetable intake by affecting home availability of this food group ($p < 0.05$).

Conclusions

Food insecure women are less likely to meet daily recommendations of fruits and vegetables due to its limited availability in their homes. By affecting home food environment, food security affects the dietary intake habits for fruits and vegetables.

Introduction/Background

Food insecurity, the condition of inconsistent or uncertain availability of safe and nutritionally adequate food, is considered a major public health issue in the U.S. (Gundersen, 2013; Hoefer & Curry, 2012). The IOM Workshop Report on food

insecurity and obesity concluded that it is critical to address food insecurity in order to address health disparities and reduce the obesity rate among the low-income population in the U.S (IOM, 2011). Food security is categorized into four levels by the U.S. Department of Agriculture (USDA): (a) food secure, (b) marginal food security, (c) low food security, and (d) very low food security. In marginal food security the head of household expresses anxiety or worry over food affordability, while at low food security, the household lacks the means to buy nutritious or a variety of higher quality foods. The most severe level, very low food security, comprises households that experience food shortage and hunger (USDA, 2014). In the literature and according to the USDA, low to very low food security are often as referred to as—food insecurity. In this paper, food insecurity will also be used interchangeably to represent low to very low levels of food security (USDA, 2014).

Women, who generally play the main role in managing the food budget and meal preparation, are consistently affected by the negative effects of marginal to very low levels of food security (Dinour et al., 2007; Franklin et al., 2012; Larson & Story, 2011). In contrast to high food security, marginal to very low levels of food security are associated with lower diet quality including lower intake of fruits and vegetables (Kendall et al., 1996; Leung et al., 2014; Rose & Oliveira, 1997; Tarasuk, 2001). Results of a large study using NHANES data indicated that as food security worsened, dietary quality was negatively impacted including significant decreases ($p < 0.0001$) in daily vegetable intake (Leung et al., 2014). In a similar study, it was estimated that the intake of fruits and vegetable did not differ between food secure and insecure participants,

however, the use of fat as a flavoring was more common among food insecure women (Mello et al., 2010).

Though limited, studies with pregnant women have shown that food insecurity is associated with poor pregnancy outcomes including high rates of birth defects of food insecure women (Carmichael et al., 2007). A study of 810 pregnant women indicated that marginal to very low levels of food security were common among participants and it was associated with a significant excess weight gain during pregnancy. It was found that, women from food insecure households gained on average 1.87 kg more than fully food secure women (Laraia et al., 2010). However, there is limited information on how food insecurity affects dietary choices during pregnancy.

Home food supply or the home food environment has been shown to influence diet quality for both children and adults (French et al., 2008; Nackers & Appelhans, 2013). When home food environment was studied in a sample of primarily African-American (n = 319) overweight/obese low-income women (non-pregnant), the findings suggested that home food environment is an important predictor in consumption of healthy and unhealthy foods. This study indicated that the availability of fruits and vegetables was significantly associated with intake of these items ($p < .001$), and availability of processed, packaged food was significantly associated with the intake of calories from fat ($p = .01$; Kegler et al., 2014).

In estimating an association between food insecurity and home food environment, Kaiser et al. (2003) indicated that food insecurity was associated with lower availability and variety of foods, in particular fruits and vegetables, in low-income households. After

controlling for maternal education, the availability of fruits among food insecure mothers was almost 50% less than food secure mothers. However, this study was conducted with only Latina immigrant mothers, limiting its generalizability to the wider U.S. population (Kaiser et al., 2003). Nackers and Appelhans collected home food inventories of 41 low-income families and compared their findings across the different levels of food security. Results of this study indicated that the availability of nutrient rich foods (fruits and vegetables) was significantly lower ($p < .05$) while the availability of calorie-dense or processed, packaged foods was significantly higher among marginal, low and very low food secure households ($p < .05$) compared to fully food secure families (Nackers & Appelhans, 2013).

The current literature indicates that there is a negative relationship between low levels of food security and healthy dietary behaviors. Similarly, it is seen that food insecurity is associated with a poor home food environment, particularly the availability of fruits and vegetables (Kegler et al., 2014; Mello et al., 2010). However, to our knowledge, the inter-relationship between food security status, home food environment and diet behaviors, especially for recommended food groups of fruits and vegetables, is not clear among general and even low-income pregnant women. The objectives of this study were to (a) Determine the differences in home availability of fruits and vegetables by food security levels, and (b) Examine the inter-relationship between food security, availability of fruits and vegetables at home and the frequency of fruit and vegetable intake among low-income pregnant women.

Materials and Methods

Study Design and Setting

In a cross-sectional study pregnant women in their second trimester (13–27 weeks) were interviewed by trained research staff using a structured interview questionnaire. Recruitment and interviews were conducted in the Supplemental Nutrition Assistance for Women, Infants, and Children (WIC) clinic in central North Carolina. A convenience sample of pregnant women was recruited from January 2014 to July 2014, during their WIC maternity certification appointment. The University of North Carolina at Greensboro and the University of North Carolina at Chapel Hill Institutional Review Boards' approved the study and all participants provided written informed consent upon recruitment.

Recruitment and Interviews

Research staff reviewed daily maternity appointment folders to determine potential participants. Women were deemed eligible to participate in the study if they were (a) enrolled or currently receiving WIC vouchers; (b) ≥ 18 years of age; (c) 13–27 weeks pregnant (second trimester); and (d) able to speak either English or Spanish. Folders of women who met the study criteria were flagged for WIC staff members to provide study information to pregnant women during the appointment. Upon interest, pregnant women met with the research staff in a private office or interview rooms located in the WIC clinic for further information, recruitment, and participation in the study. Upon provision of written consent, women participated in a 45- to 60-minute closed-ended structured interview. For most of the participants (80%), interviews were carried

out in between wait times during the certification appointment or on the same day of recruitment. For the remaining participants, a separate day and time was scheduled for the interview at the WIC office. At the end of each interview, the participant received a $25 grocery store gift card as an incentive.

Sample Size

To estimate difference in fruit and vegetable intake by 5% by food security levels, with assumption that 20% of variability is explained by the other covariates having a power of 0.80 at the 5% significance level, a minimum sample of 125 women was calculated. To ensure a complete dataset at the minimum sample size, over recruitment was carried out during the seven-month data collection period.

From January 2014 to July 2014, 198 women were recruited and interviewed. Typical maternity enrollment at the WIC clinic was approximately 10 cases per week and any women meeting eligibility requirements were screened for interest in participation. Of those 10 cases per week, roughly 70% met the study criteria and were successfully recruited into the study. On average, seven interviews were carried out per week. Most of the interviews (80%) were carried out immediately following recruitment within the wait times of their WIC maternity appointment. For the others, or about one to two participants per week, an appointment was scheduled. Participants were given appointment cards and they were reminded the day before their appointment by text or phone call with the option to reschedule. Of the total 40 separate appointments, only 15 potential participants did not show up at the original or rescheduled appointments. Hence, overall, a very high participation rate was noted in this study (> 70%).

Measures

Research staff utilized a structured interview questionnaire that included the following four main sections: (a) Socio-demographics; (b) Household food security status; (c) Frequency of intake of fruits and vegetables; and (d) Home food environment by the availability of different forms of fruits and vegetables.

Socio-demographics. Under this section, questions were asked to collect information on age, monthly household income, ethnicity and household size. Information on participation in the Supplemental Nutrition Assistance Program (SNAP), education, planned vs. unplanned pregnancy and general health status was also collected.

Household food security. Food security was measured using the U.S. Department of Agriculture's (USDA) 18-item U.S. Household Food Security Survey Module (FS survey). This survey is divided into three stages (i.e. Household, Adult and Child) and enquires about the self-reported occurrence of different situations related to food shortage and access at both the household and individual level over a set period of time. The FS survey is administered by the U.S. Census Bureau as part of the Current Population Survey to measure state and national levels of food insecurity annually and is validated in the U.S. population (α = 0.743-0.856 for all households in a 12-month reference period and α = 0.789-0.356 for all households in a 30-day reference period) (Hamilton et al., 1997). The standard survey utilizes a 30-day or one-year reference period to assess food insecurity. For this study, the reference period was changed to "Since you've become pregnant or in the past few months . . ." to capture food insecurity during pregnancy. The total score is calculated based on the number of affirmative

responses to the 18 statements, such as, "*did you or other adults in your household worry whether your food would run out before you got money to buy more?*" Hence, the total score ranged from 0 to 18, which in turn was divided into the following four standard categories: 0 score: Food secure; 1–2 score: Marginal food security; 3–7 score: Low food security, and 8–18 score: Very low food security. For households without children (individuals < 18 years of age), eight child-referenced questions are omitted from the 18-item FS survey and final scoring was based on the first 10 items assessing the household and individual situation related to food affordability and access. When using the 10-item questionnaire or for households with no children, the following standardized scoring categories are used: 0 score: Food secure; 1–2 score: Marginal food security; 3–5 low food security; and 6–10 very low food security. For this study, we used the above mentioned standardized scoring system for participants living with and without children to group participants into the four categories of food security.

Frequency of intake of fruits and vegetables. The 2013 Behavioral Risk Factor Surveillance System (BRFSS) Fruit and Vegetable Food Frequency Questionnaire was used (CDC, 2013a). The BRFSS questionnaire has demonstrated moderate validity and reliability in assessing frequency of fruit and vegetable consumption at the population level (CDC, 2011). The questionnaire specifically assessed the frequency (daily, weekly, or monthly) of consumption of (a) fruits (no fruit juices); (b) vegetables (excluding fried potatoes); and (c) 100% fruit juice. For instance, for fruits, first the participants were asked: "Do you eat fruits?" If participants said "Yes" then participants were asked how many times per day, week, or month they consumed fruits. Using a standard calculation

method (NIH: National Cancer Institute, 2015), reports of weekly consumption habits were divided by seven, and reports of monthly consumption habits were divided by 30 for estimation of frequency of daily consumption. This information was used to determine mean daily fruit and daily vegetable intake. Though frequency of intake of 100% fruit juice was asked, the analyses was restricted to only fruits and vegetables to ensure direct comparability with the home availability score.

Home food environment or the availability of different forms of fruits and vegetables. The availability of fruits and vegetables was measured using an inventory of commonly eaten fruits and vegetables in U.S. households (Marsh, Cullen, & Baranowski, 2003). The inventory enquired about the different forms (fresh, dried, canned, frozen) of commonly eaten fruits and vegetables totaling to 44 items in the list. The reference period of the past seven days was used. For example, participants were asked: "which of the following items do you have or have had at home in the past seven days." The dichotomous option of 'yes' or 'no' was provided.

This 44-item inventory for fruits and vegetables has been previously validated by Marsh et al. (2003) and found to have substantial agreement (75.9%) between the self-reported inventories and observations conducted by the researchers. The inventory by Marsh et al. was based on the popular fruits and vegetables identified from population based food consumption surveys.

In the inventory, the 44 items of fruits and vegetables were broken up into seven categories which included: (a) fresh fruits (9 items), (b) canned fruits (5 items), (c) dried fruits (4 items), (d) frozen fruits (3 items), (e) fresh vegetables (13 items), (f) canned

vegetables (6 items), and (g,) frozen vegetables (4 items). At the end of each type of fruit and vegetables category, participants were asked to list any other fruits and vegetables (i.e., fresh, frozen, canned or dried) they may have that were not listed. All the 'Yes' or affirmative responses were added. In addition, each self-recalled fruit or vegetable from the "other" category was given one point toward the calculation of a total and sub-categorical score for each type of fruit and vegetable.

Spanish Speaking Participants

The questionnaire and all study materials were provided in English and Spanish. In case of the Spanish survey questionnaire, the Spanish version of the USDA's 18-item FS survey was used. The Spanish version of the FS survey has been tested, validated and is used in the Current Population Survey and other national surveys for Spanish speaking population. Similarly, the Spanish version of the BRFSS Fruit and Vegetable Food Frequency Questionnaire was used. The remaining two sections (i.e., socio-demographics and the inventory for availability of fruits and vegetables at home) were first translated from original English version into Spanish using a basic online translation program (Google Translate). This translated version was reviewed and back translated by our first generation Latina community interviewer to assess content and concept accuracy against the English version. The bilingual community interviewer also reviewed the Spanish questionnaire for cultural appropriateness and relevance. In addition, pilot-testing was carried out with the first five Spanish speaking participants to ensure the translation was accurate. These pilot surveys are not included in the main results.

Statistical Methods

The data was entered and coded using the Statistical Package for the Social Science (SPSS version 17.0 [Inc. Chicago. IL]). For all analyses, the level of significance was set at $p < 0.05$. Descriptive statistics were computed to estimate socio-demographic characteristics of the sample. Continuous variables such as age and income were categorized into tertile or quartile categories using the normal distribution range. Frequencies of socio-demographic variables were also calculated for the sample as a whole, and according to food security status. Chi-square analysis was used to test for associations between socio-demographics and food security status. One-way ANOVAs were used to test for differences in the total availability of different forms of fruits and vegetables at the home based on food security status. Bonferroni post-hoc tests were used to control for family wise Type I error when making pair-wise comparisons between different food security levels for home fruits and vegetables availability.

The mediating effect of the availability of different fruits and vegetables at home between food security and frequency of daily intake was tested separately for fruits and vegetables. Initially, these models were tested using a single mediator framework (i.e., total fruits available or total vegetables available), and subsequently using a multiple mediator framework (i.e., for fruits: fresh, canned, dried and frozen fruits; for vegetables: fresh, canned, and frozen vegetables). Mediation model testing was conducted using Mplus v. 7.31 software (Muthén & Muthén, 2012). The relationship between food security and frequency of daily fruit and vegetable intake was estimated using bootstrap methods discussed by Preacher and Hayes (Preacher & Hayes, 2008). To control for any

socio-demographic variables that might be associated with daily intake of fruits or vegetables in this sample, bivariate correlation analyses—Pearson product moment (r) and point-biserial (r_{pb})—were conducted (results not shown here). Both correlation coefficient magnitude and alpha level were taken into account when considering which variables should be included as covariates in the mediation models. Based on it, age (r = 0.16, p = 0.023) and the "Other" category in ethnicity (r_{pb} = -0.12, p = 0.086) were controlled for fruit intake. While, for vegetables, participation in SNAP (yes/no; r_{pb} = -0.12, p = 0.083) and household income (r = 0.10, p = 0.145) were taken into account in testing the mediating model. Confidence interval coverage was set at 95%, and the number of bootstrap samples was set at 5000. Indirect effect estimates for which CI_{95} did not contain zero were considered statistically significant, and interpreted as evidence of mediation. Finally, R^2 values were reported as measures of effect size, and used to help gauge the practical significance of each model. Income data was missing for one participant, resulting in a sample size of n = 197 for models of vegetable intake, versus a sample size of n = 198 for models of fruit intake.

Results

Socio-demographics

The average age of the participants was 26 years and 38% of participants were pregnant for the first time. On average monthly household income of the participants was $1,126, with 13% reporting zero household income. As indicated in Table 2, approximately half of the participants (54%) were receiving SNAP. More than one-third of the participants (34%) did not have a car and 61% reported being unemployed. About

half of the participants reported being African Americans (see Table 2) and 17% reported being Hispanic. The "other" ethnic group represented mainly refugees and immigrants from different countries such as Burma, Vietnam and Bhutan. In education, 51% reported having high school or less education and 59% reported as single, divorced or separated.

Table 2

Socio-demographic Characteristics and its Association with Food Security (FS) Status (*N* = 198)

Socio-demographic characteristics	*n* (%)	Food Secure %	Marginal FS %	Low FS %	Very low FS %
Age					
18-24	90 (45)	39	16	22	23
25-30	61 (31)	34	21	29	16
31-35	47 (24)	40	24	19	17
Income Per Month[a]					
0 - $ 500	54 (27)	30	17	19	34
$ 501 - $ 1000	50 (25)	28	24	32	16
$1001 - $ 1500	43 (22)	44	21	21	14
$1501 or more	50 (26)	49	14	23	14
Employment Status					
Working	78 (39)	40	18	19	23
Not working	120 (61)	37	19	27	17
Education					
High school or less[b]	101(51)	37	22	25	17
More than high school	97 (49)	39	15	23	23
Marital Status					
Married/living together	82 (41)	43	12	28	17
Single/divorced/separated	116 (59)	34	23	21	22

Table 2

Cont.

Socio-demographic characteristics	*n* (%)	Food Secure %	Marginal FS %	Low FS %	Very low FS %
Ethnicity					
Non-Hispanic White	38 (19)	37	8	26	29
Hispanics	34 (17)	47	18	23	12
African American	101 (51)	37	23	21	19
Other [c]	25 (13)	32	16	32	20
Receives SNAP [d]					
Yes	107 (54)	31	21	26	22
No	91 (46)	47	15	21	16
Have a car					
Yes	131 (66)	40	17	23	21
No	67 (34)	34	23	25	18
Parity status					
Primiparous	75 (38)	36	16	25	23
Multiparous	123 (62)	39	20	23	18

[a] Household income, $n = 197$
[b] also included trade school
[c] participants from Asia, middle east, and other countries
[d] Supplemental Nutrition Assistance Program

Food Security

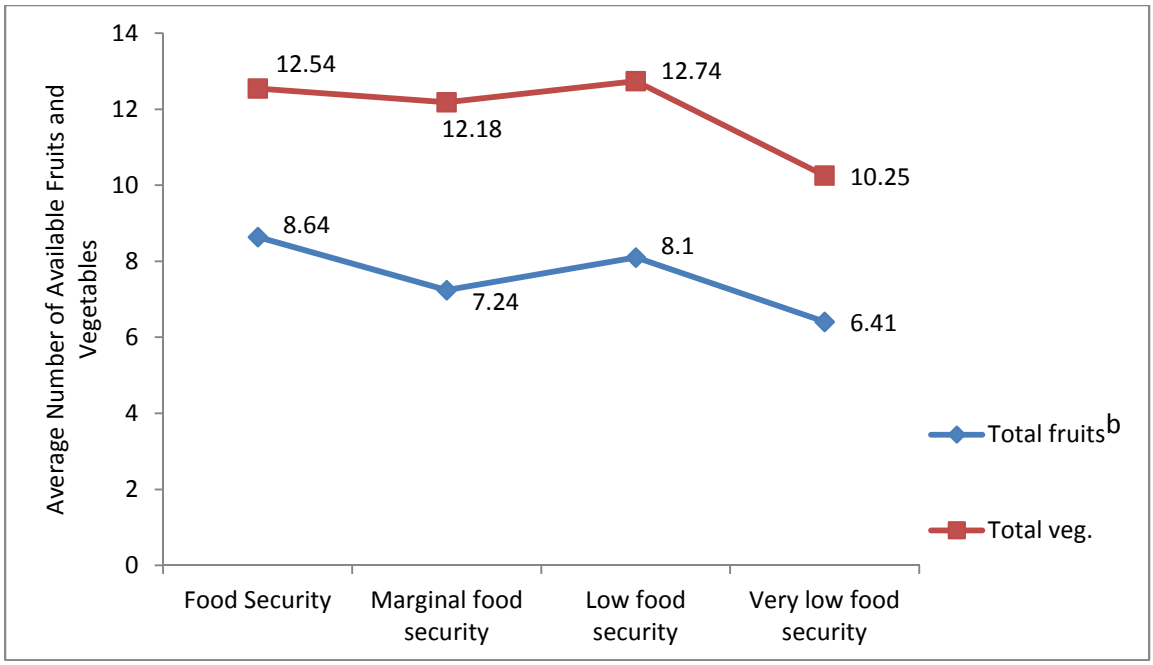
Among 198 WIC pregnant women, 38% were fully food secure and 19% reported marginal food security. Among the remaining, 24% reported low and 19% reported very low food security. As shown in Table 2, no significant association was found between various socio-demographic characteristics and food security levels.

Frequency of Intake of Fruits and Vegetables

After converting frequency of intake of fruits and vegetables into daily intake, it was found that the mean daily intake of fruits (excluding 100% fruit juices) was 1.7 times a day. The average total vegetable intake (including green leafy, orange and other types), among study participants was two times per day.

Availability of Fruits and Vegetables at Home by Food Security Levels

On average, eight different types of fruits and 12 different types of vegetables were available in participants' households. The comparison of total availability of various types of fruits across food security levels (see Figure 4) indicated that fruit availability decreased as food security worsened ($F_{(3,197)} = 3.12$, $p = .028$). Bonferroni post-hoc tests indicated that the significant difference existed between the two extreme levels of food security. In other words, participants with very low food security ($M = 6.41 \pm 3.96$) had a significantly lower availability of any form of fruits compared to food secure ($M = 8.64 \pm 3.82$) pregnant women. In the case of vegetables, though marginally significant ($p = 0.086$), a similar pattern was observed. Home availability of different forms of vegetables was lower among very low food secure women ($M = 10.26 \pm 4.91$) compared to their food secure counterparts ($M = 12.55$, $SD = 4.62$; see Figure 4).



[a] ANOVA
[b] Total Fruits: $F_{(3,197)} = 3.12$, $p = .028$, Post-hoc Bonferroni's = .009, significant difference between food security and very low food security status.

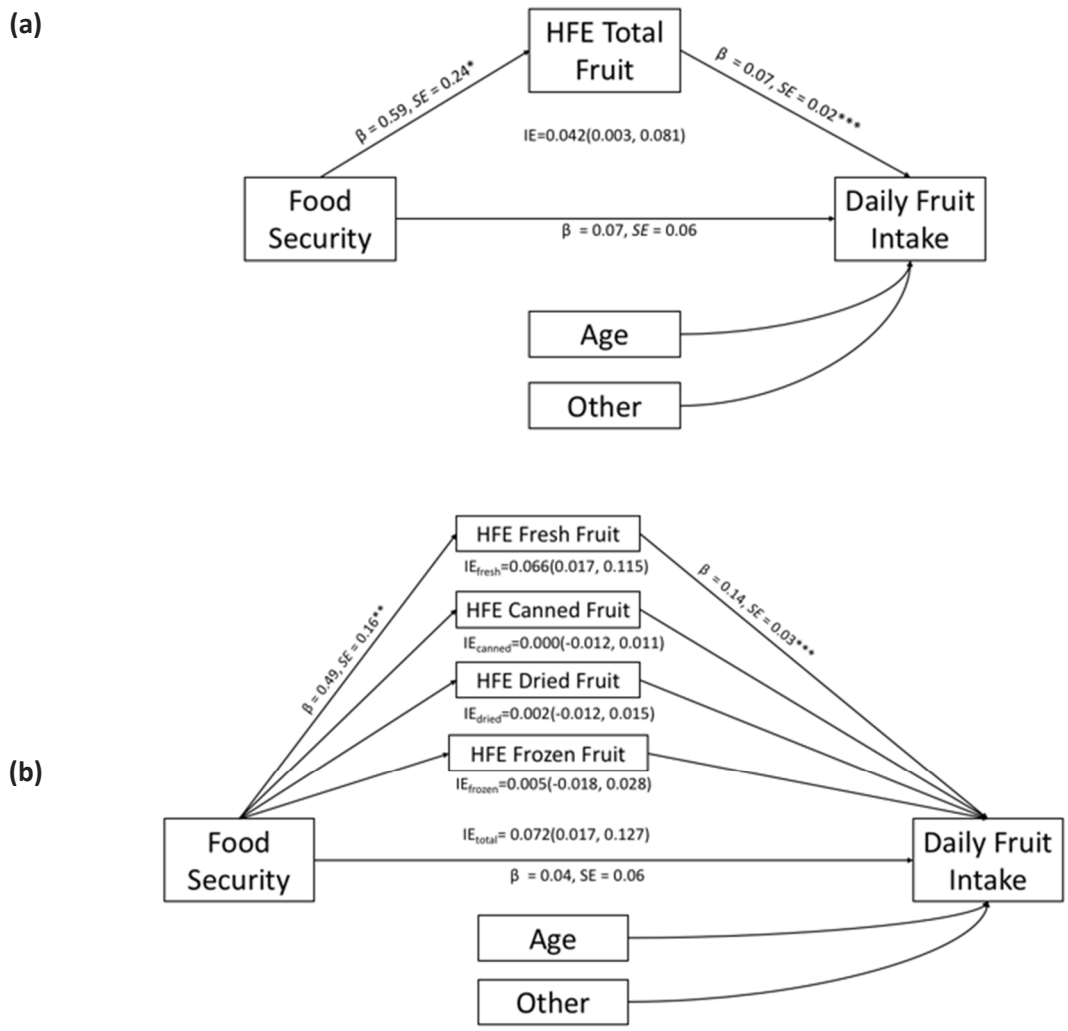
Figure 4. Availability of Fruits and Vegetables at Home by Food Security Status (N = 198).

Mediating Effect of Home Availability of Fruits and Vegetables on the Relationship between Frequency of Fruit and Vegetable Intake and Food Security Level

As indicated in Figure 5(a), food security status was significantly associated with the total variety of fruits available at home ($\beta = 0.59$, $SE = 0.24$, $p = .013$), but was not directly associated with the daily fruit intake ($\beta = 0.07$, $SE = 0.06$, $p = .264$). The mediation analysis by the Bootstrap method indicated that food security status significantly affected the daily fruit intake through total variety of fruits available at home (IE = 0.042, CI_{95} = 0.003, 0.081, Figure 5(a)). That is, as food security decreased, the availability of different forms of fruits also decreased, and consequently so did the

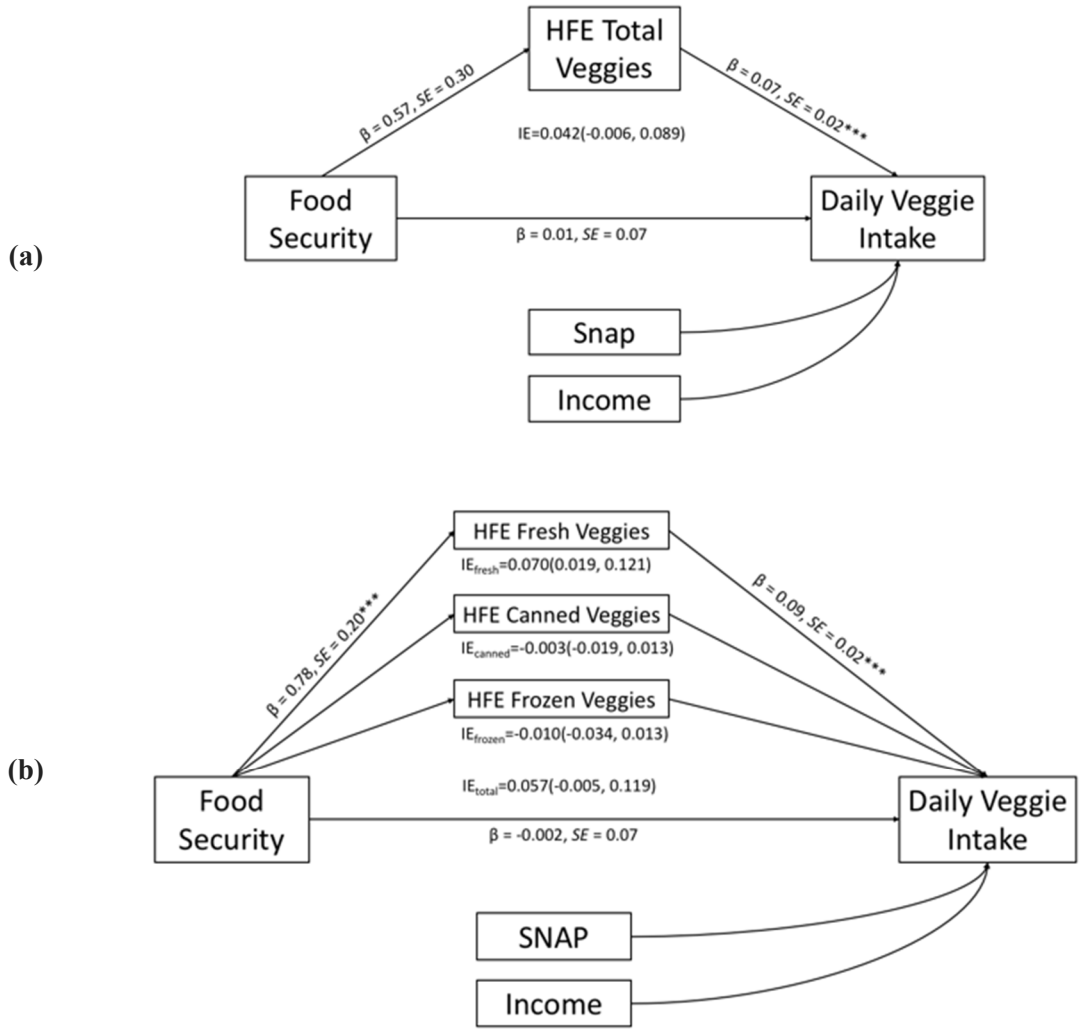
frequency of daily intake. When availability of fruits at home was separated by types—fresh, canned, dried, and frozen—it was found that the food security status specifically affected the availability of fresh fruits ($\beta = 0.49$, $SE = 0.16$, $p = .002$), and in turn indirectly affected the daily fruit intake ($IE_{freshfruit} = 0.066$, $CI_{95} = 0.017 – 0.115$), as illustrated in Figure 5(b).

For vegetables, food security status was not associated with the availability of different vegetables at home ($\beta = 0.57$, $SE = 0.30$, $p = .053$, Figure 6a). Similarly, like fruits, food security was not directly associated with the daily vegetable intake ($\beta = 0.01$, $SE = 0.07$, $p = .868$). The indirect effect of food security status, through total available vegetables, on daily vegetable consumption failed to reach significance ($IE = 0.042$, $CI_{95} = -0.006 – 0.089$, Figure 6a). However, when vegetable availability at home was separated by types—fresh, canned, and frozen form—it was found that, specifically, the availability of fresh vegetables was associated with food security status, which in turn was associated with intake. Hence, as food security worsened, the availability of fresh vegetables decreased ($\beta = 0.78$, $SE = 0.20$, $p < .001$) and daily vegetable intake decreased ($IE_{freshveg}\beta = 0.070$, $CI_{95} = 0.019 – 0.121$, Figure 6b).



*$p < 0.05$, **$p < 0.01$, and ***$p < 0.001$. Direct effects are: Path coefficients (β) and standard errors (SE), Indirect effects (IE) are presented with 95% confidence intervals.

Figure 5. Mediation Analysis to Estimate Inter-relationship between Food Security, Availability of Fruits at Home, and Their Frequency of Intake (N = 198). (a) HFE Total Fruit; (b) HFE Fruit Categorized by Fresh, Canned, Dried, and Frozen Fruit.



$^{*}p < 0.05$, $^{**}p < 0.01$, and $^{***}p < 0.001$. Direct effects are: Path coefficients (β) and standard errors (*SE*), Indirect effects (IE) are presented with 95% confidence intervals. Sample size is 197 due to one case missing for income.

Figure 6. Mediation Analysis to Estimate the Inter-relationship between Food Security, Availability of Vegetables at Home, and Their Frequency of Intake (*N* = 197). (a) HFE Total Veggies; (b) HFE Categorized by Fresh, Canned, and Frozen Veggies.

Discussion and Conclusions

This study was conducted to estimate the prevalence and severity of food insecurity during pregnancy, a time during which poor health and dietary choices can affect not only the mother's health but her infant's by affecting key health predictors such as birth weight and gestational age (G. C. Lu et al., 2001; Moore, Davies, Willson, Worsley, & Robinson, 2004). The results our study indicated that low to very low levels of food security or food insecurity are common in this sample. Our study was focused specifically on low-income pregnant women and those receiving WIC—a food assistance program for women and children living at or below 185% of the federal poverty level (U.S. Department of Agriculture: Food and Nutrition Service, 2015). Studies on women participating in WIC have reported food insecurity rates from 27% to as high as 42% (Anding et al., 2001; Mathews, Morris, Schneider, & Goto, 2009). Among our study participants, 43% were experiencing, low to very low levels of food security, indicating that women were not just worried, but were compromising on the quality and quantity of their diet. Laraia et al. (2006) examined food insecurity among pregnant women, and found that only 10% were food insecure. This dissimilarity can likely be a result of the difference in selection criteria, particularly income levels. For our WIC pregnant participants, the household income was ≤ 185% of poverty level whereas Laraia et al. used a criterion of ≤ 400% of the poverty level. Unlike other studies we did not see differences in food security rate by race/ethnicity, education or participation in the SNAP program (Herman et al., 2004; Laraia et al., 2006; McCurdy & Metallinos-Katsaras, 2011). This may be attributable to two reasons. Firstly, our study focused solely on

women classified as low-income. Secondly, we made comparisons across all four levels of food security compared to many other studies in the field that typically collapse and analyze low and very low food security together into a “food insecure” category, and food secure and marginal food security together into a “food secure” category.

Overall average intake of fruits and vegetables among adults in the U.S. is 1.1 times per day for fruit and 1.6 times per day for vegetables (CDC, 2013b). In our study, though little higher than the national trend, the intake of fruits and vegetables was 1.7 and 2 times a day. However, the results indicate that low-income women receiving food assistance, might be less likely to meet general intake recommendations of 1.5–2.0 cup equivalents of fruit and 2–3 cups of vegetables per day. This is concerning, as adequate intake of fruits and vegetables is critical to ensuring sufficient levels of various micronutrients such as vitamin A, folic acid and iron are for healthy development of the fetus (Procter & Campbell, 2014).

Studies on the role of home food environment indicate that it represents the proximal food availability for consumption and is a critical connector between external physical access to healthy, unprocessed foods such as fruits and vegetables and the actual dietary intake of these items (French et al., 2008; Fulkerson et al., 2008; Kegler et al., 2014).

The findings of our mediation analysis indicate that by affecting home food environment, food insecurity indirectly affects dietary behaviors. Specifically, as food security deteriorates, the availability of fresh fruits and vegetables decreases which consequently decreases the overall intake of fruits and vegetables. This might be due to

the possibility that the availability of different canned and frozen fruits and vegetables at home might not be significantly different between food secure and insecure households. As expected, food secure households might have financially and physically, more access to fresh fruits and vegetables than insecure households. For instance, food insecure families tend to live in low-income neighborhoods, which are shown to have poor access to a variety and good quality of fruits and vegetables (Finney-Rutten et al., 2010; Nackers & Appelhans, 2013; Walker et al., 2010). Studies indicate that even WIC Farmer's Market Nutrition Program (FMNP) vouchers are not used regularly by low-income women due to poor access to farmer's markets. Additionally, cost analyses indicate that fresh fruits and vegetables are more expensive than frozen and canned varieties. As a result, use of canned and frozen varieties, are often encouraged among low-income families. In addition to cost, a longer shelf life makes non-fresh or other forms of fruits and vegetables more desirable (Darmon & Drewnowski, 2015).

Overall availability of different forms of fruits was significantly lower among very low food secure women or those who reported skipping meals and cutting portion sizes in our sample. An earlier study by Kendall et al. (1996) also found that food insecure households had lower mean availability of fruits (7.8) compared to food secure households (8.6). Especially in a situation of limited food budget, food insecure families may focus more on purchasing non-perishable, calorie dense foods that may be cheaper compared to low satiety, but more nutritious, foods such as fruits and vegetables. In addition, food insecurity has been associated with poor cooking skills and limited familiarity with fruits and vegetables (McLaughlin et al., 2003). These issues, taken

together, might in part, explain the lower availability of fruits among our participants. This study highlights a need to screen low-income pregnant women for food security. Results of this study indicate that assessing household food security and providing additional educational and social support to improve home food environment and, thereby dietary habits, is critical for low-income pregnant women.

A limitation of this study is the use of a convenience sampling technique whereby there is a risk of either over or under representation of certain population groups. However, the demographic characteristics (Table 3) of this sample were closely representative of the county and state demographics regarding race/ethnicity, and nationally representative regarding pre-pregnancy body mass index (BMI). Measuring only frequency of fruit and vegetable intake without measuring their specific amounts or serving sizes limits the specificity of the study results. This also limits our ability to directly compare our findings to current recommendations for fruit and vegetable intake that are reported as cup equivalents. All measures were self-reported, which may have resulted in over or under reporting on certain measures due to social desirability bias. Overall, restricting recruitment to WIC pregnant women may reduce generalizability of the results and accurate prediction of food access issues among other low-income pregnant women not receiving WIC or food assistance. It is possible that due to food assistance, WIC pregnant women might be more likely to be food secure and have a higher capacity to purchase fruits and vegetables.

CHAPTER V

PREDICTORS AND OUTCOMES OF EXCESS GESTATIONAL WEIGHT GAIN AMONG WIC PREGNANT WOMEN

This chapter is an article draft prepared for submission to the Maternal and Child Nutrition Journal.

Abstract

Excess gestational weight gain (GWG) has been identified as a major predictor of poor health outcomes, both among mothers and children, in a short and long term. Increasing the number of women meeting GWG recommendations, has become a national health priority. The objectives of this cross-sectional study were to assess the prevalence and severity of excessive GWG; examine the association between GWG and health status during pregnancy including size for gestational age; and identify predictors of excessive GWG, among low-income pregnant women. WIC pregnant women were interviewed and their post-natal records were retrieved (n = 169) to assess socio-demographic characteristics, pre-pregnancy BMI, GWG and size for gestational age. Results indicated that 66% of the participants were overweight/obese at the beginning of pregnancy. More than half (64%) of the participants were gaining above IOM recommendations with an average of 10 lbs (4.5 kgs) in excess weight. Logistic regression indicated that obese (OR = 2.89; CI = 1.236, 6.750; p = 0.014); being African American (OR = 2.20; CI = 1.103, 4.378; p = 0.025) and those with unplanned pregnancies (OR = 2.05; CI = 0.99, 4.62; p = 0.053) were at significant risk of gaining

excess weight in pregnancy. Addressing pregnancy planning and providing education, and counseling on appropriate GWG should be considered as key intervention targets for reducing the epidemic of obesity and racial/ethnic disparities in birth outcomes in the U.S.

Introduction

The American College of Obstetricians and Gynecologists (ACOG) and the IOM have identified excess gestational weight gain (GWG) as a major area of concern for public health (ACOG, 2005; Rasmussen et al., 2010). In light of the burgeoning obesity epidemic and a greater percentage of women entering pregnancy overweight or obese, many of which, gaining too much weight during pregnancy, the IOM reviewed the role of GWG in predicting maternal and birth outcomes including obesity risk among children. The review indicated that weight gain during pregnancy is indeed a major predictor for poor pregnancy outcomes including gestational diabetes, caesarean delivery and low initiation of breastfeeding (Rasmussen & Yaktine, 2009). Based on this evidence, the revised IOM guidelines (2009) re-defined the recommended weight gain by pre-pregnancy body mass index (BMI) categories (Rasmussen & Yaktine, 2009). These categories now include a specific and, relatively narrow, range of recommended weight gain for obese women compared to the original 1990 recommendations for women to gain “at least 15 lbs.” without a stated upper limit (Table 3).

In the U.S. roughly half of all women and 60% of overweight/obese pregnant women exceed IOM recommendations for GWG (Brawarsky et al., 2005; Catalano, 2007; Chu & D’Angelo, 2009). In the context of the obesity epidemic, excessive GWG is

also associated with poverty, food insecurity, and poor access to health care (Dinour et al., 2007).

Table 3

Institute of Medicine Guidelines for Weight Gain during Pregnancy[a]

Pre-Pregnancy BMI[b] Classification (BMI(kg/m^2))	Total Weight Gain Range (lbs.)
Underweight (< 18.5)	28–40
Normal weight (18.5–24.9)	25–35
Overweight (25.0–29.9)	15–25
Obese (≥ 30.0)	11–20

[a] Guidelines are for singleton pregnancies. (ACOG, 2013)
[b] BMI= Body Mass Index

In terms of the post-natal effects of excess GWG, studies have shown that women who gain more than 20kg (44 lbs) during pregnancy, move up one BMI category at 6 months post-partum (Nohr et al., 2008; Viswanathan et al., 2008). Consequently, this increase in BMI leads to subsequent metabolic changes that put women at risk for chronic diseases and health complications including diabetes, hypertension, and dyslipidemia (Gaillard et al., 2013). Excessive GWG is also independently and strongly associated with poor birth outcomes, specifically, macrocosmic or large for gestational age infants (Viswanathan et al., 2008). Subsequently, infants who are large for gestational age are likely to have a higher capacity to store body fat. According to life course theory, with further support from the Barker hypothesis on developmental origins of disease,

macrosomic infants with excess adiposity are then at an increased risk for obesity and chronic disease later in life (de Boo & Harding, 2006; Russ et al., 2014).

Considering the critical importance of GWG, the 2009 IOM report also called for more research investigating the role of socioeconomic, cultural, and environmental factors in predicting GWG, with specific recommendations to target those women at higher risk of not meeting the recommendations for weight gain during pregnancy. In a study of 810 mid to low-income women, food insecurity or limited access to nutritious food was associated with higher GWG and gestational diabetes mellitus (Laraia et al., 2010). In focus group discussions with low-income pregnant women participating in the Special Supplemental Nutrition Assistance Program for Women Infants and Children (WIC), women frequently cited- family pressure to "eat for two" and minimal knowledge of appropriate weight gain goals during pregnancy, as two major barriers in meeting GWG recommendations (Herring et al., 2016).

Studies have found that low-income women (those living at ≤ 150 % of the poverty guideline), were more likely to enter pregnancy overweight, gain more than the recommended amount of weight during pregnancy, and experience a higher risk of poor health post-partum (Lederman et al., 2002; Paul et al., 2013; Skouteris et al., 2010). In a sample of low-income, African American mothers, 64% of the total sample (across all BMI categories) gained excessive weight during pregnancy and among those women who were overweight or obese before pregnancy all gained above IOM recommendations (Lederman et al., 2002). In a sample of 101 low-income women of primarily Hispanic and African American ethnicity/race, peri-natal depression was associated with excess

GWG but this association weakened after controlling for socio-demographic characteristics such as income, education and employment (Wright et al., 2013).

Literature on obesity prevention indicates that pregnancy is a critical window of opportunity to prevent two generations of obesity and potentially stop the cycle of chronic disease. The literature further highlights the importance of understanding which women, especially among low-income groups, are at higher risk for excess GWG. Identifying those at highest risk, will inform study design and provide critical implementation targets for future interventions that support appropriate weight gain in pregnancy. Therefore, the objectives of the study are to (a) assess the prevalence and severity of excessive GWG; (b) examine the association between GWG and health status including size for gestational age, and (c) identify predictors of excessive GWG, among low-income pregnant women.

Research Design and Methods

Pregnant women attending a WIC clinic were recruited for this cross-sectional study if they met the following selection criteria: (a) receiving WIC as a maternity client, (b) 18 years of age or older, (c) in the second trimester of pregnancy (defined as 13 to 27 weeks), and (d) ability to speak either English or Spanish. Participation involved a two-part research process: (a) a 45- to 60-minute, in-person interview conducted in the WIC clinic using a closed-ended questionnaire (to collect socio-demographics, food insecurity status; pre-pregnancy body weight and height); and (b) a review of postnatal records after delivery (to extract delivery weights of mother and infant, information on diabetes,

hypertension, and gestational age). The study protocol was approved by the county WIC department and the XXXX and XXXXXXX IRBs (withheld for anonymity).

Data Collection Procedures

Recruitment

Recruitment of eligible participants was conducted at the WIC clinic during initial maternity certification appointments. Research staff identified eligible participants at the beginning of the day (by age and estimated due date) and flagged their folder with a study flyer. WIC staff informed the women of the study and introduced interested women to the research staff for recruitment. Study flyers were also posted throughout the WIC clinic waiting room, women's restrooms, and county health department building.

In-person Interview Using a Closed-ended Questionnaire

Upon recruitment and provision of written consent, each participant was interviewed using a closed-ended questionnaire for approximately 45-60 minutes in one of two private spaces at the WIC office during her maternity certification appointment. Initial maternity certification appointments required up to two hours, including long waiting periods. Research staff conducted the interview during these waiting periods, giving WIC staff priority to interrupt for the next aspect of her WIC certification appointment. The study was designed to integrate the research process within the wait times of certification appointments where WIC staff collaborated extensively with research staff to minimize burden on both participants and the clinic. Further detail on recruitment and study design are described elsewhere. As an incentive, each participant was given a $25 Wal-Mart gift-card at the end of the interview. Interviews in English

were conducted by trained graduate research assistants and interviews in Spanish were administered by a trained bilingual community outreach worker fluent in English and Spanish. Most (80%) of the interviews were conducted during initial recruitment, however, during recruitment, participants were also given the option to schedule their interview for another day and these scheduled interviews were conducted in the same private spaces at WIC. Participants with scheduled interviews were given appointment cards and phone call or text message reminders the day before their interview with the option to reschedule.

The in-person interview questionnaire contained the following three main sections:

1. *Socioeconomic and demographic status*: Information on participants' age, household size, income, and ethnicity was collected under this section. This section also included questions to collect information on parity, whether the pregnancy was planned or unplanned, and if participant was receiving another major form of food assistance i.e., Supplemental Nutrition Assistance Program (SNAP)
2. *Household food security status*: This section measured food security using the United States Department of Agriculture's (USDA) validated U.S. Food Security (FS) Survey. This 18-item scale was used for households with children, while for households without children, a 10-items FS scale (without the last 8 statements pertaining to food situations for children) was used. A score of 1 was given for each affirmative response, consequently, for

households with children the total score ranged from 0 to 18, while, for households without children the score ranged from 0 to 10. Using the standard scoring categories for households with or without children, study participants were divided into the following four categories: 1) High food security (0 score); 2) Marginal food security (1-2 score); 3) Low food security (3-7 score with children/3-5 score without children); or 4) Very low food security (8-18 score with children/6 – 10 score without children). For Spanish interviews, a validated Spanish version of the U.S. Food Security Survey was used. The remaining sections on socio-demographic variables were first translated using a basic online translation program (Google Translate). This translated version was reviewed and back translated by our first generation Latina community interviewer to assess content and concept accuracy against the English version. The community interviewer also assessed all translated text for cultural appropriateness.

3. *Pre-pregnancy body mass index (BMI):* At the end of the interview, participants were asked to self-report height and pre-pregnancy weight. Self-reported pre-pregnancy weights has shown to correlate well with measured weights (Lin, DeRoo, Jacobs, & Sandler, 2012). The information for this study was collected in participants' preferred metrics i.e., kilograms or pounds for weight and inches/feet or meters for height. Using this information participants' BMI was calculated using the following standard formula: [weight (in kilograms) divided by height (in meters) squared (National

Institutes Of Health, 1998). Prior to BMI calculation, all weight values were converted from pounds to kilograms while height values were converted from inches to meters. The BMI values were then grouped into the following four standard categories: 1) < 18.5 kg/m^2 = underweight; 2) 18.5-24.9 kg/m^2 = normal; 3) 25-29.9 kg/m^2 = overweight; 4) ≥ 30.0 kg/m^2 = obese.

Review of Postnatal Records after Delivery

Participants' post-natal medical records were retrieved to collect information on the following variables: (a) participants' body weight at the end of pregnancy, (b) occurrence of gestational diabetes; (c) occurrence of hypertension; (d) gestational age, and (e) birth weight of the newborn. Participants signed a HIPAA release form at the beginning of the initial in-person interview to allow for the collection of data from any records the county health department had related to their pregnancy and birth outcomes. Using date of birth, unique patient ID and name, each participant's interview information was matched with her records. Research assistants worked with the county health department records staff to compile this information.

For the analyses, participants' body weight at the end of pregnancy was subtracted from the self-reported body weight recorded during the interview. The difference was used to estimate net weight gained or lost in lbs. This information was then compared with the IOM recommended range of weight gain by participant's pre-pregnancy BMI category. Subsequently, this comparison was used to group women into the following three categories of GWG: (a) below, (b) within, and (c) above IOM

recommended range. For those who gained above the recommended range, the amount of excess weight was calculated from the maximum range number for each BMI category.

Information on gestational diabetes and hypertension during pregnancy, noted with a yes or no option, was retrieved from the post-natal records. Information on infant birth weight and gestational age from post-natal records was retrieved to calculate size of gestational age for infants. Size for gestational age of full term (≥ 37 weeks) infants was estimated using the World Health Organization (WHO) growth charts for infants and children by gender (CDC, 2016). For preterm (< 37 weeks) infants, size for gestational age was determined using the Fenton growth charts for preterm boys and girls (Fenton & Kim, 2013). Small for Gestational Age (SGA) infants are classified as those who weigh in the 10th percentile or less for their gestational age and Large for Gestational Age (LGA) infants are those who weigh in the 90th percentile for their gestational age. For the purposes of analyses, all SGA or LGA infants were re-categorized as non-normal size for gestational age and all other Appropriate for Gestational Age (AGA) infants were categorized as normal size for gestational age.

In total, 198 pregnant women were recruited and interviewed from January to July 2014. In retrieval of postnatal information, 29 cases did not have complete information on GWG, birth weight of newborn and related pregnancy outcomes, therefore the sample size for socio-demographic analyses was 198, while the sample size involving GWG and pregnancy outcomes was 169.

Data Analytic Procedures

All data for this study were entered and coded using the Statistical Package for the Social Science (SPSS version 17.0 [Inc. Chicago. IL]). For all analyses, the level of significance was set at $p < 0.05$. Descriptive statistics and frequencies were computed to estimate socio-demographic characteristics, food insecurity rate and pre-pregnancy BMI distribution among participants. Preliminary analyses were also carried out to estimate the percentage of women exceeding the IOM recommendation for GWG and the range of excessive weight gain.

One-way ANOVA was used to examine significant differences in mean excess weight gain by socio-demographic variables: income per month, employment status, education, marital status, ethnicity/race, receiving SNAP, parity, food security status and planned vs. unplanned pregnancy. The extent of excess weight gain during pregnancy was also compared by two indicators of gestational health outcomes, diabetes and hypertension. Finally, the difference in excess weight gain during pregnancy was compared by birth outcome or the infants' size for gestational age (normal vs. non-normal (LGA and SGA)). For the analyses, women who were categorized as having an underweight pre-pregnancy BMI and those who lost weight during pregnancy ($n = 9$) were excluded from analyses to avoid empty cells or less than five cases per cell.

Multivariate analysis using backwards stepwise logistic regression was carried out to estimate the predictors for not meeting the IOM guidelines for GWG. The dependent variable was meeting (0) vs. not meeting the IOM recommendation for GWG (1), in the model.

Socio-demographic characteristics that were associated with excess weight gain at the p = 0.05 to 0.10 level in the bivariate analyses of ANOVA (see Table 5), were included in the backwards stepwise regression model. Odds ratios (OR) and the corresponding 95% Confidence Interval (CI) were reported for logistic regression analyses. The goodness-of-fit test of Hosmer-Lemeshow test was used.

Results

Descriptive analyses indicated that the average monthly household income of participants was $1,126, with 13% reporting no household income. The average age of participants was 26 years and 38% were pregnant for the first time. Approximately half of the participants (54%) were receiving Supplemental Nutrition Assistance Program (SNAP) benefits. Roughly 61% reported being unemployed. About half of the participants identified as being of African American race (n = 101), 19% identified as Non-Hispanic White (n = 38) and 17% identified as Hispanic (n = 35). The 'other' ethnic/racial category represented mainly refugees and immigrants from different countries such as Myanmar (formerly Burma), Vietnam and Bhutan (n = 24). Overall, 51% reported having high school education or less and 59% reported being single, widowed, divorced, or separated. When examining food security status, 57% were food secure and the remaining 43% were food insecure, of them 24% experienced low food security, while 19% reported very low food security indicating hunger in the household.

Descriptive results on pre-pregnancy BMI categories indicated that 33% of participants started pregnancy in the normal BMI category, with 32% and 34% of participants in overweight and obese categories, respectively. The remaining participants

were underweight at the beginning of pregnancy. Sixty-four percent of women across all pre-pregnancy BMI classifications were gaining above IOM recommendations. Based on the calculations for net weight gain during pregnancy, using self-reported pre-pregnancy weight and recorded weight at the delivery, it was found that on average, women in this sample were gaining 10 lbs (4.5 kgs) in excess weight above the maximum IOM cutoff range (see Table 4). Post-natal records (n = 169) indicated that the rate of gestational diabetes was 5%, and the rate of hypertension was 7%. Using gestational age and infant birth weight from post-natal records, growth chart plots indicated that 71% of infants were Appropriate for Gestational Age (AGA), 10% were Large for Gestational Age (LGA or > 90th percentile), and 6% were Small for Gestational Age (SGA or < 10th percentile).

Results of One-way ANOVA analyses indicated that excessive GWG was significantly associated with marital status, parity, and pre-pregnancy BMI (see Table 4). Specifically, women who were single, divorced or separated, those having their first child, and those women classified as obese were all gaining high amounts of excess weight. Additionally, participants who reported this pregnancy as an unplanned pregnancy were gaining significantly higher amounts of excess weight compared to women with planned pregnancies. Education level and ethnicity were marginally associated with excess GWG with those having more than high school education and those of African American identity gaining the highest amount of weight. Food security status was not significantly associated with excess GWG in our sample.

Table 4

Average Excess Weight Gain above IOM Recommendations in Relation to Participant Characteristics

Participant Characteristics	*M* (± *SD*)	Significance (*p*)
Income Per Month[a]		
0 - $ 500	13.23 (12.83)	0.18
$ 501 - $ 1000	10.11 (13.28)	
$1000 or more	8.62 (11.42)	
Employment Status		
Working	11.66 (14.06)	0.14
Not working	8.78 (10.71)	
Education		
High school or less[b]	8.22 (11.15)	.07*
More than high school	11.81 (13.22)	
Marital Status		
Single/divorced/separated	12.41 (13.72)	0.004
Married/living together	6.82 (9.33)	
Ethnicity/Race		
Not African American	8.16 (12.07)	.07*
African American	11.69 (12.40)	
Receives SNAP[d]		
Yes	9.08 (12.40)	0.27
No	11.27 (12.22)	
Parity		
Primiparous	13.31 (14.72)	0.01
Multiparous	8.18 (10.37)	

Table 4

Cont.

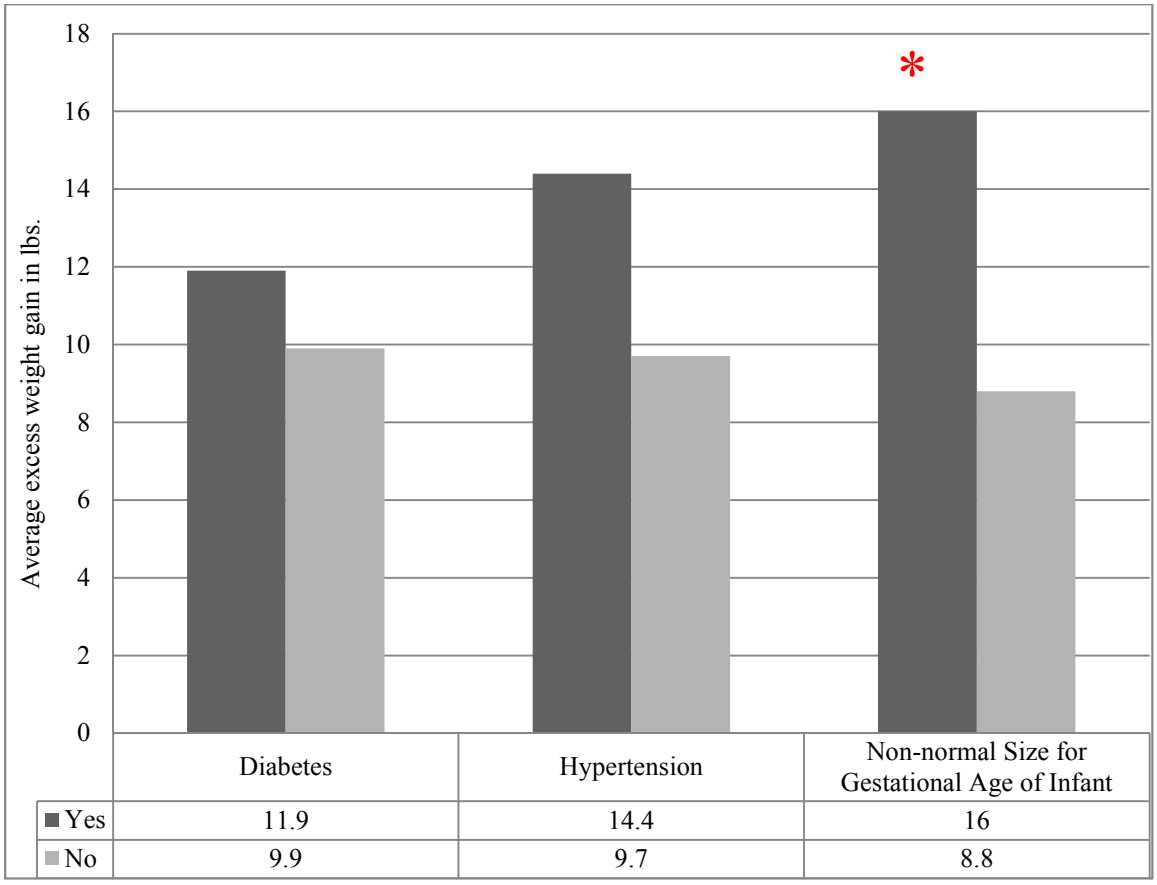
Participant Characteristics	*M* (± *SD*)	Significance (*p*)
Food Security		
Secure	10.53 (13.05)	0.57
Insecure	9.40 (11.40)	
Planned Pregnancy		
Yes	6.67 (8.60)	0.02
No	11.52 (13.43)	
Pre-pregnancy BMI		
Normal	7.35 (10.20)	0.03
Overweight	9.33 (11.94)	
Obese	13.55 (13.95)	

Note. 95% CI, One-way ANOVA, significance set at $p < 0.05$; * marginal significance set at $p < 0.1$

Though not significant, excess GWG was associated with gestational diabetes and hypertension (see Figure 7). Results indicated that women with gestational diabetes gained an average of 11.9 lbs of excess weight during pregnancy compared to 9.9 lbs of excess weight among women without diabetes. In examination of birth outcomes, excess weight gain during pregnancy was significantly associated with non-normal size for gestational age infants (nearly all large for gestational age) and these women were gaining nearly double the amount of excess weight compared to those women giving birth to normal size (Appropriate) for gestational age infants (see Figure 7).

Multivariate logistic regression results showed that African American identity, unplanned pregnancy, and an obese pre-pregnancy BMI increased the risk of not meeting the IOM recommendation for GWG. In the final model, the odds of the participant

gaining above the IOM recommendation for GWG were 2.2 times higher among those who were African American (see Table 5). Women with an unplanned pregnancy were twice as likely to not meet the IOM guidelines versus those with planned pregnancies. Finally, the odds of not meeting the IOM guidelines were 2.89 times higher for women with an obese pre-pregnancy BMI compared to those who started pregnancy at a normal BMI.



One-way ANOVA, 95% CI, Significance set at $p < 0.05$
Hypertension ($p = 0.24$); Diabetes ($p = 0.67$); Non-normal Size for Gestational Age Infant ($p = 0.006$)

Figure 7. Pregnancy Outcomes by Average Excess Weight Gain above IOM Recommendations.

Table 5

Odds of Excessive Weight Gain above IOM Recommendation by Participant Characteristics

Characteristics	Odds Ratio	95% Confidence Interval	Significance (*p*)
Pregnancy Planning			0.053
Planned	1.00		
Unplanned	2.05	0.99, 4.62	
Ethnicity/Race			0.025
Not African American	1.00		
African American	2.20	1.103, 4.378	
Pre-Pregnancy BMI			0.050
Normal	1.00		
Overweight	1.55	0.689, 3.496	0.289
Obese	2.89	1.236, 6.750	0.014

Note. Dependent variable is gestational weight gain with 0 = meeting IOM recommendations by BMI weight class and 1 = not meeting IOM recommendations. Significance set at $p < 0.05$.

Discussion

The purpose of this paper was to describe and analyze potential socio-demographic characteristics that may put low income women at risk of excessive GWG in pregnancy. Women with overweight and obese pre-pregnancy BMIs in this sample were gaining significant amounts of excess weight, with women in the obese classification gaining double that of those in the normal weight category. This finding is not surprising and aligns with much of the previous literature (Chu et al., 2009; Fuemmeler et al., 2016; Wright et al., 2013). In a sample of 101 low-income women, Wright et al. (2013) found that 49% of overweight/obese (pre-pregnancy BMI)

participants gained above IOM recommendations. Women in our study who gained the highest amount of excess weight were also those who were pregnant for the first time. Excessive weight gain has been found to be significantly predictive of postpartum weight retention and this association has been strongly associated in nulliparous women (Endres et al., 2015; Haugen et al., 2014; Kirkegaard et al., 2014; Krukowski, Bursac, McGehee, & West, 2013). Haugen et al. (2014) found that 74% of nulliparous women in her sample gained above IOM recommendations and experienced significant postpartum weight retention compared to their multi-parous counterparts. The results of this study and previous studies indicate a critical need for programs aimed at helping nulliparous women gain weight within the recommendation during pregnancy and prevent them from entering the obesity cycle.

Women in this study who reported that this was an unplanned pregnancy also experienced a significant amount of excess weight gain. This is concerning, since approximately 50% of pregnancies in the U.S. are unplanned (Finer & Zolna, 2011). In alignment with our study, Endres et al. (2015) found that women with unplanned pregnancies were at significant risk of retaining more than 20 lbs postpartum. Unplanned pregnancies are more common among low income, single, ethnic /racial minority women. Additionally, unplanned pregnancy has been associated with delayed prenatal care and poor maternal and infant outcomes including premature birth and poor nutritional status (Mayer, 1997; Mosher, Jones, & Abma, 2012; Orr, Miller, James, & Babones, 2000).

Women in our study who reported as single, divorced or separated also experienced significant excessive weight gain. Like our study, Olson and Strawderman

(2003) found that 42% of women who reported as separated or divorced and 48% of women who reported as single gained above IOM recommendations compared to only 38% of married women. These findings may suggest that a lack of social support could be a factor. Maternal and child health researchers suggest broadening the examination of health disparities among low income women by seeking to understand how the contextualization of their lives puts them at risk (M. C. Lu & Halfon, 2003; Ramey et al., 2015; Shonkoff et al., 2011). Many cite the preconception stress resiliency model which hypothesizes the importance of mother-father relationships and social support as important factors in biosocial development during pregnancy. It is important to note that the absence of a spouse or partner does not necessarily indicate that these mothers are not getting social support from other friends or family. Extended family social networks for low-income pregnant women should be further investigated as potential factors and/or modifiers of excessive weight gain in pregnancy. Qualitative studies suggest that women who have access to other mothers, friends and family members, view them as facilitators to a healthy pregnancy by providing support and health information during pregnancy (Anderson et al., 2015). Laraia, Borja, and Bentley (2009) found that the presence of a grandmother in the household was associated with food security, which in turn was associated with normal weight gain during pregnancy and low rate of gestational diabetes. The authors suggested that family support might offer not only financial assistance, but also emotional support in the form of guidance on healthy eating, and support for prenatal care (Laraia et al., 2009). Overall, the findings that unplanned pregnancy and being single/divorced/separated were associated with excess GWG in this

sample, suggest a need for future research to address the role that the spouse/partner plays in access to health care, food security, and the ability to manage or prioritize health during pregnancy.

Regression analyses further indicated that African American women, were more likely to exceed IOM recommendations (OR = 2.20; CI = 1.103, 4.378; $p = 0.025$) for weight gain during pregnancy, even after considering education and income. Like our study, Lederman et al. (2002) found low-income African American mothers, to be at higher risk of excess GWG. In their study, over two-thirds of the sample gained above IOM recommendations and all of the overweight and obese mothers gained excessive weight with an average gain of 46 lbs and 41 lbs, respectively (Lederman et al., 2002). Traditionally, African American women were more at risk of insufficient GWG (Herring et al., 2016; Krukowski et al., 2013). However, in recent research this trend has changed toward a higher risk of gaining over recommendations compared to Hispanic and Caucasian women. Herring, Henry, Klotz, Foster, and Whitaker (2012) suggest that perception and knowledge of appropriate weight gain may be contributing factors to excess GWG for African American women. For instance, participants in their study believed that consuming higher calories and gaining more weight during pregnancy was protective for their baby (Herring et al., 2012). A qualitative study examining knowledge and beliefs related to eating and health behaviors for pregnant African American women found that gaining more weight was considered protective and women felt that physical activity might harm the fetus (Goodrich, Cregger, Wilcox, & Liu, 2013). Participants in their study also cited cravings and the availability of unhealthy foods as barriers to

healthy eating. Previous studies have also found correlations between GWG, perceptions and family influence or folk beliefs in association with birth weight of newborns (Everette, 2008; Kapadia et al., 2015).

As expected, higher amounts of excess GWG were significantly associated with having an infant of non-normal size for gestational age (the majority of which were large for gestational age) in this study. A study by Bowers et al. (2013) found that African American women who gained excess weight in pregnancy were significantly more likely to give birth to a large for gestational age infant (LGA). In a sample of primarily African American and Hispanic mothers, those who gained excess gestational weight had infants that were 5% larger, even after controlling for pre-pregnancy BMI (Fuemmeler et al., 2016). Excess GWG has been strongly associated with health and metabolic complications in infants, which has been demonstrated to put them at risk of chronic disease and obesity later in life (de Boo & Harding, 2006; Russ et al., 2014). These findings taken together with research on weight perception and knowledge about GWG suggests that there is a critical need for interventions targeting education and counseling on appropriate GWG in mothers to prevent macrosomia or LGA infants.

Interestingly and contrary to many previous findings, socio-economic status (SES), including income, education, and food security status were not significantly associated with excess GWG in our sample. One plausible explanation for this could be due to sampling an all low-income population where they have to meet strict guidelines for WIC participation of 185% of the poverty guideline. This was a cross-sectional study utilizing a convenience sampling method focusing solely on low-income WIC

participants which may limit the generalizability of these study results to the larger population and may have masked associations normally seen with socio-economic predictors.

Conclusions

The findings of this study highlight a crucial need to further examine the role that social factors such as family and/or spouse/partner support may play in mediating GWG and the risks of excessive weight gain. Interventions targeted at achieving healthy pre-pregnancy BMI with emphasis on family and social support may be key in increasing the number of low-income women meeting IOM recommendation for weight gain during pregnancy, particularly among ethnic and racial minorities. In a new position paper by the Academy of Nutrition and Dietetics on obesity and pregnancy outcomes calls for interventions that specifically target pre- and perinatal counseling and education programs on maintaining a healthy weight and appropriate weight gain in pregnancy (Stang & Huffman, 2016). Recent research suggests that women who are counseled by their clinicians on appropriate GWG and given recommendations for diet and lifestyle changes, are more likely to gain within the IOM guidelines (Kapadia et al., 2015; Ledoux et al., 2015). Perhaps more support is needed for agencies, like WIC, who provide programs like Centering Pregnancy, a peer support group which has been demonstrated to reduce excessive GWG (Tanner-Smith et al., 2014). GWG is a key modifiable factor that can affect both women's and infants' health in the short and long term. Therefore, it is imperative to identify the factors that put women at highest risk of gaining excessive

weight in pregnancy and design community based interventions that support women in healthy lifestyle and behavior changes that promote appropriate weight gain.

CHAPTER VI

EPILOGUE

Summary of Findings

Food insecurity was prevalent in this sample at 43%, but contrary to my initial hypotheses, food insecurity was not significantly (directly) associated with any of the traditionally associated variables in this study such as socio-demographic and economic variables. Though it has been previously demonstrated, food insecurity was also not associated with gestational weight gain in this study. Food insecurity was indirectly associated with frequency of fruit and vegetable intake through its mediation effects on home food environment or the availability of fruits and vegetables. This suggests that food insecurity may be acting on food choice and purchasing behavior, an idea well supported by previous literature (Darmon & Drewnowski, 2015). However, it is important to also factor in the issue of the built environment, which leads us to questions of geographic proximity and accessibility to stores/vendors that provide these nutritious foods. The role of the home food environment and its relationship with diet behavior should be further explored among pregnant women as it suggests a primary intervention point to increase consumption of more nutrient dense fruits and vegetables. We may not have seen significant correlations with food insecurity due to the finding that our sample was fairly homogenous (low variance) in terms of income- a major predictor of food insecurity.

Unexpectedly, excess gestational weight gain appeared as a significant factor for participants in this study. It is well documented that low-income women and racial/ethnic minorities are at increased risk of excess gestational weight gain. Our findings were similar in that African American women, those who were single, those with an unplanned pregnancy, and those who had higher pre-pregnancy BMIs all gained excessive weight. Women in this study who gained the most weight also had infants with non-normal size for gestational age. These findings taken together suggest the need for future intervention based studies that focus on counseling and education regarding appropriate gestational weight gain and pre-conception planning and weight management. Life course theory suggests that this excess gestational weight gain is key modifiable factor in predicting the long and short term health of the mother and her baby.

Overall, the findings of this study suggest that future food insecurity research with pregnant, low-income women move into intervention based models that focus on cost efficient food purchasing and possibly preparation to maximize the availability and therefore intake of fresh fruits and vegetables. More studies are needed to examine how the external environment impacts the home food environment for pregnant women. The results of which would be useful in developing interventions to increase the availability of fruits and vegetables. Future nutrition based studies could also look at partnering with agencies like WIC and their Centering Pregnancy program to really target appropriate gestational weight gain by providing more directed education on appropriate weight gain at each stage and how it can be managed through diet.

Difficulties Encountered and Lessons Learned

Throughout the process of this project I have learned many things in both the practical and personal sense. As is common in community research, things do not always run smoothly or as expected. I will say that many of the setbacks and challenges I faced in this study were learning opportunities that I have taken to heart. We grow most in the discomfort.

One of the most rewarding and perhaps daunting aspects of this process was making the decision to seek out research assistants from our department. This project was extremely labor intensive and with my dogged determination to (attempt to) stay within the six-month window of recruitment originally planned in the grant, it was necessary to find help. We were able to meet most of our self-imposed and grant deadlines and I wholly attribute this to the dedication of the research assistants with data entry, interviewing participants, and conducting 24-hour recalls. While nine research assistants meant we got more work done in less time, it did not make for less work. It was difficult to manage not only their schedules, but coordinate participants and work around the WIC schedule and their services. I do believe that I learned a lot about myself as manager and about what motivates others to do good work. In the future, I would like to do more "random" checks of my assistants to be sure that work is consistent. For example, I would have liked to have my assistants do 24-hour diet recalls periodically (unannounced) on me to determine if they were consistently asking all the right questions. I would also have liked to sit in more on random interviews to observe the assistants.

For this study it was necessary to work with Spanish interpreters. While this was extremely helpful and allowed us to collect data with Spanish speaking participants, this presented some of the most difficult challenges. As I have learned, there are not many interpreters available to do this work and while finding them is challenging, finding someone who is invested in the project is even riskier. In the future, I would take more time in vetting the interpreter up front and be prepared to more quickly make changes if I felt they were not the right fit.

In this study we also had a fairly high no-show rate for appointments and though I did not keep a strict record, I probably recited the recruitment script for double the number of women who actually participated. In the future, I will keep very detailed records of every interaction even if it is just for field note reference. I would also like to include a brief survey for non-participators or those who decline just to capture some of the major demographics and analyze those differences against the participating sample. It is important to know at least some of what makes them different. Recruitment flyers in this study were not helpful, I received only two to three calls from the flyers. I feel I may have actually gotten more participants by word of mouth.

Collaboration with our community partner was key in this study. The study was built on the relationship that we had with each and every WIC staff member. Dr. Dharod and I emphasized from the beginning that we saw our partnership with them as a marriage that could only work with transparency and frequent, clear communication. If something wasn't working or they had suggestions—I wanted to know. For this reason, and the fact that I frequently—maybe obsessively—asked for their input, I believe they

trusted us and really put in the effort on their end to support our work. The staff made valuable suggestions that strengthened the research process including how we communicated about the location of participants and routing.

It was invaluable to have the space they offered and their support. Though it is difficult and it asks a lot of both sides, I truly believe that working right alongside the community partner ("back of the house") is the best way to recruit the people that they serve. I was there nearly every day that WIC was open and strove to be present with the WIC staff and my research staff. The staff even joked toward the end that they should put me on payroll. I saw WIC as a machine with many working parts, and my job was to fit the FIP research machine in seamlessly. I learned that I love that part. Deconstructing the process of WIC and determining strategies to build our processes in without disrupting flow. Most of all, I learned that you have to nurture and value the relationship you have with your community partner, they are the gatekeepers and, in the case of the WIC staff, change agents of their community.

Future Areas of Interest

Through this project I learned that I really enjoy working with and mentoring students. It was exciting to lead them in this work and encourage them to step out of their own comfort zone. I have had many doubts along the way about my ability and what I want to do, but working with students is something I'm sure about and that has only solidified as a result of this project.

In the future I would like to focus on a more community based participatory research (CBPR) model whereby we further engage members of the community (of

interest) and train them to be not only interviewers but collaborators in analysis and interpretation of the data that they help to collect. I felt through this project and in my master's work that we can sometimes miss the nuances that contextualize our findings if we do not engage directly and fully with the community. Ultimately, I want to include the participants more fully as part of the research process and include more qualitative mixed methods to capture these nuances. Out of this research it became apparent that there is a need for research collaboration within community programs that are already working and are already focused on similar outcomes. I learned that the Centering Pregnancy program that WIC already offers is a support group based program that follows a cohort of women through their pregnancy. This program offers peer support on breastfeeding, exercise, and parenting skills and has demonstrated its ability to reduce gestational weight gain and improve maternal and child health. This program would be an ideal place to do small intervention/education programs that add more focus on increasing fruit and vegetable consumption and could also be a place to have a conversation about food access and security especially related to home food environment and possibly healthy meal preparation. In the CBPR model, you could take it further by training moms to conduct these lessons or discussion groups.

I worked with many diverse women in this study and overall I believe that this work has shown me that I am passionate about maternal and child health. What intrigues me for future work is examining the spheres of influence for women. Using a social ecological model, we know that women are affected by their communities, the environment of food access and economic stability, but more centrally, how does her

social support system and economic structure impact her health and food security? Does the makeup of her household change the dynamic? Does she have medical conditions that absorb more of her income than someone without those conditions. I would ultimately like to develop a scale or survey that attempts to address economic and social support constructs as an adjunct scoring system for food insecurity

Throughout my work in food insecurity research, I have become more aware of the need to further develop a key element or construct in its measures—time. Most surveys of food security capture this issue in a 30 day or one-year reference period, but I do not think that food security is a short term problem. Many of the women we surveyed reported that they had been receiving some sort of food assistance for their whole lives. Do you feel food insecure now, if food shortage has been ever present? The conceptual understanding of food security must be altered if you have a lifetime or multiple generations experiencing shortage. Likely this also merits further investigation of coping mechanisms and the idea of "relative experience." I would like to further develop this idea of temporality and determine if we are not missing something in the way is it currently measured. If we examine food insecurity as a predictive factor in life course theory, that adds an even further time trajectory to these questions. Does food insecurity of the mother affect her children long term? These answers could have wider implications for how we view food security and how we address policy and programs that move generations out of food insecurity.

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APPENDIX A

STRUCTURED INTERVIEW GUIDE

In-person questionnaire

To conduct an interview, recruit participants that meet all of the following criteria:

- *Is 18 years or older.*
- *Currently pregnant and in the second trimester (13 to 27 weeks)*
- *Participating in the WIC program*

SCRIPT: Hi, my name is _____. I am from the FIP study with UNCG which will be carried out to understand daily food habits during pregnancy and any concerns you may have related to food affordability. If you are interested in participating in this study you will be asked to participate in an in-person interview today (which will last approximately 1 hour to an hour and a half) and a telephone interview in approximately two weeks. We will also be asking for permission to access your medical records. If you are interested in participating in this study but unavailable to complete this interview today, then we can schedule the interview for another time. Some benefits to completing this study include being able to discuss and share your opinions and viewpoints regarding food affordability and dietary habits during pregnancy. There is a minimal risk for participating in this study; you may feel uncomfortable discussing food related issues with us. However, any information collected for this study will not be shared with anyone and is strictly confidential. If you feel uncomfortable at any time you are free to discontinue participation at any time. Also, your privacy will be protected at all times by deleting any identifiable information such as your name, address, phone number, or date of birth. All information obtained in this study is strictly confidential unless disclosure is required by law. Please let me know if you have any questions before deciding on participating.

Interviewer:

1. Ensure ***ALL*** of the above criteria are met for an interview. If not, please thank the person and discontinue.

2. Upon meeting all criteria, ask the participant to sign two copies of each form: 1) Consent form; 2) HIPPA form. For both forms, keep one copy and give another copy to the participant.

SCRIPT: Now we would just like to start by collecting your contact information.

Contact information

Best times to call for phone interview:

A. Start time: _____ End time: _____

B. Date: _____
mm/dd/year

C. What is your name: _____

D. Address:
_____

E. Telephone number: _____

F. Alternate telephone number: _____

G. Participant's WIC ID: _____ (to access participant's medical records)

H. Birth date: _____(mm)/_____ (dd)/_____ (YYYY)

I. What is your ethnicity
1. Non-Hispanic white
2. Hispanic origin (use Hispanic sections- Acculturation & Home food envt.)
3. African American
77. Other (specify): _____

J. In which language you would like to be interviewed:
1. English
2. Spanish (if interviewee isn't bilingual, collect contact info and forward to Krycya)
3. No preference, either English or Spanish
77. Other (Specify): _____

SECTION I: SOCIO-DEMOGRAPHICS

To be filled out by interviewer:

I. Participant's unique code#: _____

II. Participant's name: _____

III. Interviewer name: _____

IV. Place of recruitment: _____

SCRIPT: This next section is just about some general information related to you and your household.

1. What is your age? _____ (note down in years)

2. How many months pregnant are you? _____

3. How many weeks pregnant are you? _____

4. What is your due date? _____
   mm/dd/year
5. What was the first day of your last menstrual period? _____/_____/____
   mm dd year 88 Don't know 99 Refused
6. Was this a planned pregnancy? 1. Yes 2. No

7. Is this your first baby? 1) Yes (skip to Q.8) 2) No
   7a. **NO**, how many children have you given birth to? _____
   7b. **NO**, what is the birth date of your last child? _____ (mm/dd/year)
   7c. **NO**, when was your last pregnancy? _____ (year)

8. Where do you live right now?
   1. AT YOUR own home/apt. (NOT with Parents, Friends or relatives)
   2. With relatives, parents or friend's --(if living with a relative please specify your relationship to that person) _____
   77. Other—(please specify) _____
   99. Refused

9. How many people including you live in the house/apartment? _____

10. How many children 17 or under live with you in the house/apartment? _____

11. What language do you primarily speak at home?

1. English
2. English and Spanish equally
3. English and other language _____, equally
77. Other language (specify) _____
99. Refused

12. Where were you born? _____, _____
City Country

13. What is your current marital status? (read the options)
1. Single/never been married
2. Married
3. Living together (not married)
4. Divorced
5. Windowed
6. Separated
77. Other (specify) _____
99. Refused

14. Which of the following best describes your current employment status? (read options)
1. Working full time, 35 hours or more a week
2. Working part time, less than 35 hours a week
3. Unemployed and looking for work
4. Unemployed and not looking for work
5. Stay at home mom
6. In school
7. Own a business/partnership
77. Other (specify)_____
88 Don't know
99. Refused_____

15. What is your religion? _____

16. What is the highest grade level you completed?
a) Elementary (K-8)
b) High school (9-12)
c) Trade school
d) Some college
e) Associate's degree
f) Bachelor's degree
g) Master's degree
h) Doctorate degree (MD or PhD)

17. Do you have health insurance? 1. Yes 2. No
17 a. **NO**, why do you not have health insurance? _____
17 b. **YES**, what type of health insurance do you have? _____

18. What is the total amount of money **YOU** receive PER MONTH including money from all salaries/work, and government non-food assistance such as unemployment (prompt: TANF, SSI, etc.)?
$_____Per month.

19. What is the total amount of money OTHER ADULTS LIVING WITH YOU receive PER MONTH including money from all salaries/work, and government non-food assistance such as unemployment?
$_____Per month.

20. What is the most common way you commute to where you need to go?
a) public transit b) taxi c) rides from friend's/family d) walk e) drives self f) other

21. Do you have a driver's license? 1. Yes 2. No

22. Do you have a car? 1. Yes 2. No

Do you or any members of your household participate in the following food or public assistance programs?

					Notes
23. School breakfast program	1 Yes	2 No	88 Don't know	99 Refused	
24. School lunch program	1 Yes	2 No	88 Don't know	99 Refused	
25. Summer food program	1 Yes	2 No	88 Don't know	99 Refused	
26. Cash assistance (TANF)	1 Yes	2 No	88 Don't know	99 Refused	
27. Food pantries	1 Yes	2 No	88 Don't know	99 Refused	
28. Soup kitchens	1 Yes	2 No	88 Don't know	99 Refused	
29. Supplemental Security Income Benefits (disability)	1 Yes	2 No	88 Don't know	99 Refused	
30. Medicaid (title 19)	1 Yes	2 No	88 Don't know	99 Refused	
31. Section 8 (rent or housing assistance)	1 Yes	2 No	88 Don't know	99 Refused	
32. If children, Healthchoice	1 Yes	2 No	88 Don't know	99 Refused	

33. Do you get SNAP/Food Stamps? 1. Yes 2. No
    a. **YES**, for how long?
        a. ___ ___ month/s
        b. ___ ___ year/s
    b. **YES**, how much in food stamps do you receive per month? $_____

34. Does anyone **else** in your household receive food stamps?
    1. Yes 2. No 77. Other_____

    a. **YES**, how much in food stamps does this person/do these people receive per month? $_____

35. Do you get WIC vouchers for your children? 1. Yes 2. No
    a. **YES**, for how many children? _____
    b. **YES**, how long (if more than one child, note down period of participation for each child, in months):
    Child I_____; **Child II** _____; **Child III** _____; **Child IV**_____; **Child V**_____

36. Do you get WIC vouchers for yourself? 1. Yes 2. No
    a. **YES**, for how long (for this pregnancy)? _____
    b. **YES**, what month in your pregnancy did you start receiving vouchers (for this pregnancy)? _____

SECTION II: HEALTH AND LIFESTYLE HABITS

SCRIPT: In this next section we will talk about your health and lifestyle habits.

1. Have you experienced morning sickness (nausea and vomiting) during your pregnancy?
   1. Yes 2. No
   If YES,
   1a. How long? _____ # weeks OR _____ #months
   1b. Has this caused you to lose weight? 1. Yes 2. No
   1c. Are you still experiencing morning sickness? 1. Yes 2. No

2. Have you had any heartburn during your pregnancy? 1. Yes 2. No
   IF YES,
   1a. How long? _____ # weeks OR _____ #months
   1b. Has this caused you to lose weight? 1. Yes 2. No
   1c. Are you still experiencing heart burn? 1. Yes 2. No

3. In general, would you say your current health is (read options):
   1. Poor
   2. Fair
   3. Good
   4. Very good
   5. Excellent
   77. Other

4. Before your pregnancy, would you say your health was (read options)
   1. Poor
   2. Fair
   3. Good
   4. Very good
   5. Excellent
   77. Other

BEFORE YOUR PREGNANCY, did any doctor or nurse tell you that you had any of the following health problems?

					Notes
5. Anemia	1 Yes	2 No	88 Don't know	99 Refused	
6. Hypertension/High BP	1 Yes	2 No	88 Don't know	99 Refused	
7. Heart problems	1 Yes	2 No	88 Don't know	99 Refused	
8. Depression	1 Yes	2 No	88 Don't know	99 Refused	
9. Diabetes	1 Yes	2 No	88 Don't know	99 Refused	
10. Asthma	1 Yes	2 No	88 Don't know	99 Refused	
11. Any other health problem (SPECIFY)_____	1 Yes	2 No	88 Don't know	99 Refused	

WHAT ABOUT CURRENTLY or DURING PREGNANCY, Has the doctor or nurse told you that you have any of the following health problems?

					Notes
12. Anemia	1 Yes	2 No	88 Don't know	99 Refused	
13. Gestational Hypertension	1 Yes	2 No	88 Don't know	99 Refused	
14. Pre-eclampsia/toxemia	1 Yes	2 No	88 Don't know	99 Refused	
15. Depression	1 Yes	2 No	88 Don't know	99 Refused	
16. Gestational Diabetes	1 Yes	2 No	88 Don't know	99 Refused	
17. Asthma	1 Yes	2 No	88 Don't know	99 Refused	

18. Any other health problem (SPECIFY)_____	1 Yes	2 No	88 Don't know	99 Refused	

19. Currently, are you taking any prenatal vitamins? 1. Yes 2. No
YES, how often (interviewer note: circle appropriate choice):
19a._____per day/ week/ month

20. Currently, are you taking iron pills 1. Yes 2. No
YES, how often (interviewer note: circle appropriate choice):
20a._____per day/ week/ month

21. Do you take folic acid pills? 1. Yes 2. No
YES, how often (interviewer note: circle appropriate choice):
21a._____ per day/ week/ month

22. Are you taking any other supplements? 1. Yes 2. No
YES, what and how often:
_____ _____ per day/ week/ month
_____ _____ per day/ week/ month
_____ _____ per day/ week/ month

23. Are you taking any other medications other than prenatal vitamins? 1. Yes 2. No
23a. **YES**, what medications are you taking:
_____
23b. **YES**, why are you taking these medications:
_____

24. Before pregnancy, did you smoke?
1. Yes
2. No
77. Other
88. Don't know / Not sure
99. Refused

25. Do you now (in PREGNANCY) smoke cigarettes every day, some days, or not at all?
1. Every day
2. Some days
3. Not at all
77. Other
88. Don't know / Not sure
99. Refused

25a, **If EVERYDAY OR SOMEDAY**, approximately how many cigarettes do you smoke per week? _____#

26. Before pregnancy, did you drink (alcohol)?
1. Yes
2. No
88. Don't know / Not sure
99. Refused

26a Do you now drink every day, some days, or not at all?
1. Every day
2. Some days
3. Not at all
88. Don't know / Not sure
99. Refused

27a. **If EVERYDAY OR SOMEDAY**, approximately how many drink/s do you drink per week? _____ One drink is equivalent to a 12-ounce beer, a 5-ounce glass of wine, or a drink with one shot of liquor.

27. How much sleep do you usually get at night on weekdays or workdays?
Number of hours_____
88. Don't know / Not sure
99. Refused

28. Have you ever been told by a doctor or other health professional that you have a sleep disorder?
1. Yes
2. No
88. Don't know / Not sure
99. Refused

SECTION III: MEAL PATTERN

SCRIPT: I am now going to ask you a few questions about your meal patterns and what you may eat on a regular basis.

1. Do you cook food at home? 1. Yes 2. No
1a. **NO,** does anyone in your household cook food at your home? 1. Yes 2. No
1b. **YES,** how often do you cook food at home? _____ per week OR ____ per month

2. Do you eat at fast food restaurants (ex. McDonald's, Wendy's, etc.)? 1. Yes 2. No
2a. **YES,** how often? # of times __ __ per week OR __ __ per month

3. Do you eat at other restaurants (Olive Garden, TGIF, Golden Corral, Chipotle, or local ethnic restaurants)?
1. Yes 2. No
3a. **YES,** how often? # of times __ __ per week OR __ __ per month

During pregnancy,

Meals	Do you eat …	About how many times throughout the week?	Reasons for skipping: 1) morning sickness 2) Not enough time 3) Nausea 4) Not a habit/general I do not eat 5) Generally not hungry at that time 6) Not enough food 7) Skip, to save food for later meals Other (explain): _____
4.Breakfast	1. Yes 2. No		
5.Lunch	1. Yes 2. No		
6.Dinner	1. Yes 2. No		
7. Snacks between meals	1. Yes 2. No		

8. Have you had any cravings during your pregnancy? 1. Yes 2. No

8a. **YES,** what cravings have you had during your pregnancy?

_____

9. Are there foods you dislike now that you are pregnant? 1. Yes 2. No

9a. **YES,** what foods do you dislike now that you are pregnant?

_____

Since you have been pregnant, how many times per day, week or month do you eat or drink:

Enter number in only one of the columns	#Times per day	#Times per week	#Times per month	88. Don't know/not sure	99. Refused	00. Never
10. Regular soda or pop with sugar						
11. Sugar sweetened beverages? (Kool-Aid, lemonade and sweet tea, Gatorade, Red Bull)						
12. 100%PURE fruit juices? Do not include fruit-flavored drinks with added sugar or fruit						
13. Fruit? Count fresh, frozen, or canned fruit						
14. Cooked or canned beans (such as refried, baked, black, garbanzo beans, beans in soup, soybeans, etc.)?						
15. Dark green vegetables (broccoli or dark leafy greens including romaine, chard, collard, or spinach)?						
16. OTHER vegetables (tomatoes, tomato juice or V-8 juice, corn, eggplant, peas, lettuce, cabbage, and white potatoes that are not fried such as baked or mashed potatoes)?						
17. Orange colored vegetables (sweet potatoes, pumpkin, winter squash, or carrots)?						

SECTION IV: PHYSICAL ACTIVITY

SCRIPT: The next few questions are about physical activity done while performing everyday activities.

1. Do your day-to-day activities involve work or a job that causes small increase in breathing or heart rate such as brisk walking or carrying **light** loads, or possibly climbing stairs?
   1. Yes
   2. No
   88. Don't know / Not sure
   99. Refused

   1a. **YES**, in a typical week, how many days does your work involve activities like climbing stairs, carrying lighter loads etc.?

   Number of days_____
   88. Don't know / Not sure
   99. Refused

   1b. **YES,** on those days, how much time do you spend doing such physical activities such as climbing stairs . . . or other physical activities at work on a typical day?

ENTER NUMBER OF MINUTES OR HOURS _____minutes OR _____hours
88. Don't know / Not sure
99. Refused

SCRIPT: The next questions exclude the physical activities that you have already mentioned. Now I would like to ask you specifically about walking. For example, walking to work, to school, or to go shopping.

2. In a typical week do you walk to get to and from places?
   1. Yes
   2. No
   88. Don't know / Not sure
   99. Refused

   2a. **YES,** in a typical week, how many times do you walk to work, to school or to go shopping
   Number of days_____
   88. Don't know / Not sure
   99. Refused

   2b. **YES**, on those days, how long do you walk or how much time you spend walking

   ENTER NUMBER OF MINUTES OR HOURS _____minutes OR _____hours
   88. Don't know / Not sure
   99. Refused

SCRIPT: The next questions exclude the work and transportation activities that you have already mentioned. Now I would like to ask you about sports, fitness and recreational activities.

3. In a typical week do you do any sports, fitness, or exercise that cause a small increase in breathing or heart rate such as brisk walking, swimming, or dancing for at least 10 minutes continuously?
   1. Yes
   2. No
   88. Don't know / Not sure
   99. Refused

   3a. **YES,** in a typical week, how many days you do exercise or play sports
   Number of days_____
   88. Don't know / Not sure
   99. Refused

   3b. **YES,** how much time do you spend doing sports, fitness or recreational activities on a typical day?
   ENTER NUMBER OF MINUTES OR HOURS _____ minutes OR _____ hours
   88. Don't know / Not sure
   99. Refused

SCRIPT: Now I would like to ask you about sitting activities such as watching TV, videos or spending time on a computer or just sitting leisurely or relaxing.

4. In a typical week how many days do you sit just to relax or to watch TV or surf internet or play computer games?
   None (0 days)
   Number of days_____
   88. Don't know / Not sure
   99. Refused

   4a. **If reported number of days:** On average how many hours or minutes you spend watching TV, playing video games or relax or be on a computer on a typical day.
   ENTER NUMBER OF MINUTES OR HOURS: _____ minutes OR _____hours

88. Don't know / Not sure
99. Refused

SECTION V: FOOD INSECURITY DURING PREGNANCY

SCRIPT: Now I would like you to answer a few questions regarding food.
For these statements, please tell me whether you have experienced such situations SINCE YOU'VE BECOME PREGNANT.

H1. SINCE YOU'VE BECOME PREGNANT, did you or other adults in your household worry whether your food would run out before you got money to buy more
1. Yes
2. No
88. Don't know/Unsure
99. Refused

H2. SINCE YOU'VE BECOME PREGNANT, did you come across a situation where the food you or other adults in the household bought did not last and there was no money to get more?
1. Yes
2. No
88. Don't know/Unsure
99. Refused

H3. SINCE YOU'VE BECOME PREGNANT, was there a time when you or other adults in your household did not have enough money to eat balanced meals (i.e., healthy and varied meals)?
1. Yes
2. No
88. Don't know/Unsure
99. Refused

AD1. SINCE YOU'VE BECOME PREGNANT, was there a time when you or other adults in your household cut the size of the meals or skipped meals because there wasn't enough money for food?
1. Yes
2. No
88. Don't know/Unsure
99. Refused

AD1a. **YES**, how often did this happen?
# of times___ ___ week OR ___ ____ month
88. Don't know/Unsure 99. Refused

AD2. SINCE YOU'VE BECOME PREGNANT, did you ever eat less than you felt you should because there wasn't enough money for food?
1. Yes
2. No
88. Don't know/Unsure
99. Refused

AD3. SINCE YOU'VE BECOME PREGNANT, were you ever hungry but didn't eat because there wasn't enough money
for food?
1. Yes
2. No
88. Don't know/Unsure
99. Refused

AD4. SINCE YOU'VE BECOME PREGNANT, did you lose weight because there wasn't enough money for food?
1. Yes
2. No
88. Don't know/Unsure
99. Refused

AD5. SINCE YOU'VE BECOME PREGNANT, did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food?
1. Yes
2. No
88. Don't know/Unsure
99. Refused
AD5a. **YES,** how often did this happen?
# of times ___ ___ week OR ___ ____ month
88. Don't know/Unsure
99. Refused

Child Referenced Questions: If the participant reported having a child or children under 18 in the household, then ask the following questions; otherwise skip to the ***End of Food Security Module***

SELECT APPROPRIATE FILLS DEPENDING ON NUMBER OF CHILDREN IN THE HOUSEHOLD.

Transition into Child-Referenced Questions:
Script: Now I'm going to ask about the food situation of your child/children living in the household who are under 18 years old.

CH1. In the PAST FEW MONTHS OR SINCE YOU HAVE BECOME PREGNANT "Did you rely on only a few kinds of low-cost food to feed your (child/any of the children) because there was no money to buy food?
1. Yes
2. No
88. Don't know/Unsure
99. Refused

CH2. IN THE PAST FEW MONTHS OR SINCE YOU HAVE BECOME PREGNANT, Did you have difficulty feeding your child/any of the children a balanced meal, because you couldn't afford food?
1. Yes
2. No
88. Don't know/Unsure
99. Refused

CH3. IN THE PAST FEW MONTHS OR SINCE YOU HAVE BECOME PREGNANT, did your (child/ or any of the children) not eat enough because you just couldn't afford enough food?
1. Yes
2. No
88. Don't know/Unsure
99. Refused

CH4. In the PAST FEW MONTHS, OR SINCE YOU HAVE BECOME PREGNANT, did you ever cut the size of your child's/any of the children's meals because there wasn't enough money for food?
1. Yes
2. No
88. Don't know/Unsure
99. Refused

CH5. In the PAST FEW MONTHS OR DURING YOUR PREGNANCY, did your child or any of the children ever skip meals because there wasn't enough money for food?

1. Yes
2. No
88. Don't know/Unsure
99. Refused

CH5a. **YES**, how often did this happen?
# of times: ___ ___ week OR ___ ____ month
88. Don't know/Unsure
99. Refused

CH6. In the PAST FEW MONTHS OR DURING YOUR PREGNANCY, was your child/were the children ever hungry but you just couldn't afford more food?
1. Yes
2. No
88. Don't know/Unsure
99. Refused

CH7. In the PAST FEW MONTHS OR DURING YOUR PREGNANCY, did your child/any of the children ever not eat for a whole day because there wasn't enough money for food?
1. Yes
2. No
88. Don't know/Unsure
99. Refused

SECTION VI: 24 HOUR RECALL

Interviewer conducting 24-hour recall: _____
Participant name: _____
Participant code: _____
Date: _____
24-hour recall date and day of the week: _____/_____/_____; _____
MM DD YEAR DAY OF WEEK

SCRIPT: Now I would like to interview you about what you had to eat and drink in the last 24 hours. This should take about 20-30 minutes and I would like to remind you that your name and answers will be kept confidential.

Could you tell me what you ate and drank throughout the whole day yesterday? Please begin from the time you woke up until the time you went to bed.

Interviewer notes:
1st pass: Record just the list of food/beverages and time consumed
2nd pass: Collect information on amount consumed and determine if anything was missed during the 1st pass.
3rd pass: List ingredients of the foods/beverages (such as how much sugar used in tea/coffee, what type of bread used in making sandwiches, or if participant used any condiments such as mustard or mayonnaise in foods. Feel free to ask participant if they want to add or change anything and begin with asking what was the first thing they ate or drank instead of asking what they had for breakfast or lunch. Also ask if they were able to finish the complete amount described.

MEAL	TIME	LOCATION	FOOD OR BEVERAGE	PORTION

SCRIPT: Would you say that this is close to the amount that you usually eat, a lot more than you usually eat, or a lot less than you usually eat? _____

Interviewer note: This question refers to the overall amount of food for the day and not the type of food. Also determine the reliability of the data; if the recall is unreliable because the participant was unable to recall one or more meals for some other reason, then note this but do not ask the participant about the reliability of the recall or share your opinion with them.

The results seem to be: **Reliable** **Unreliable**

SECTION VII: PRE-PREGNANCY BMI

SCRIPT: Thank you so much for helping us; I would like to now ask you a few questions about your pre-pregnancy height and weight.

1. About how tall are you without shoes?
   Height: ____ Ft.____ inches OR _____ meters
   88. Don't know/Unsure
   99. Refused

2. About how much did you weigh without shoes before pregnancy?
   Weight: _____pounds OR _____kilograms
   88. Don't know/Unsure
   99. Refused

3. Do you know, approximately, how much you weigh right now?
   Weight: _____pounds OR _____ kilograms
   88. Don't know/Unsure
   99. Refused

4. Do you feel you have gained too little, too much or just the right amount of weight during pregnancy?
   1. Too much
   2. Too little
   3. Just right amount
   88. Don't know

5. How much weight do you think you should gain during pregnancy? _____ lbs

6. Have you tried to lose weight during your pregnancy? 1. Yes 2. No

SECTION VIII: SOCIAL SUPPORT

SCRIPT: Now I will ask you a few questions about your social support.

Do you lend or borrow money from any neighbors, family or friends?	1 Yes	2 No	88 Don't know	99 Refused
Do you lend or borrow goods such as food, household items, or clothes, from any neighbors, family or friends?	1 Yes	2 No	88 Don't know	99 Refused
Do you have access to credit in small stores?	1 Yes	2 No	88 Don't know	99 Refused
Can you count on someone, for example, any neighbors, family, or friends, outside your household to help you with errands (like babysitting or cooking)?	1 Yes	2 No	88 Don't know	99 Refused
Do you help any friends, family or neighbors with errands (like babysitting or cooking) outside your household?	1 Yes	2 No	88 Don't know	99 Refused

SECTION IX: HOME FOOD ENVIRONMENT

SCRIPT: In the past seven days, which of the following items do you have or have had at home:

100% Fruit Juices		
1) Apple juice	☐ Yes	☐ No
2) Orange juice	☐ Yes	☐ No
3) Grape juice	☐ Yes	☐ No
4) Other 100% fruit juices (ask participant: what other 100% fruit juices they might have or had in past seven days)	_____	_____
Fresh Fruits		
5) Apples	☐ Yes	☐ No
6) Oranges	☐ Yes	☐ No
7) Bananas	☐ Yes	☐ No
8) Grapes	☐ Yes	☐ No
9) Cantaloupe	☐ Yes	☐ No
10) Pears	☐ Yes	☐ No
11) Strawberries	☐ Yes	☐ No
12) Peaches	☐ Yes	☐ No
13) Watermelon	☐ Yes	☐ No
14) Other fresh fruits (ask participant: what other fresh fruits they might have or have had in past seven days)	_____	_____
Canned Fruits		
15) Pears (whole/halves) in 100% juice	☐ Yes	☐ No
16) Unsweetened apple sauce/Natural, no sugar apple sauce	☐ Yes	☐ No
17) Oranges in 100% fruit juice	☐ Yes	☐ No
18) Fruit cocktail/salad in 100% juice (no sugar added)	☐ Yes	☐ No
19) Crushed/cubed pineapple in juice	☐ Yes	☐ No
20) Other canned fruits (ask participant: what other canned fruits they might have or have had in past seven days)	_____	_____
Dried Fruits		
21) Dried raisins (black or golden)	☐ Yes	☐ No
22) Dried apricots	☐ Yes	☐ No
23) Dried mixed fruits	☐ Yes	☐ No
24) Dried prunes	☐ Yes	☐ No
25) Other dried fruits (ask participant: what other dried fruits they might have or had in past seven days)	_____	_____

Frozen Fruits		
26) Frozen strawberries or any other berries	☐ Yes	☐ No
27) Other frozen fruits (ask participant: what other frozen fruits they might have or had in past seven days)	_____ _____ _____ _____	_____ _____ _____ _____
Fresh Vegetables		
28) Tomatoes	☐ Yes	☐ No
29) Carrots	☐ Yes	☐ No
30) Greens (kale, collard greens, or mustard greens, etc.)	☐ Yes	☐ No
31) Broccoli	☐ Yes	☐ No
32) Sweet peppers	☐ Yes	☐ No
33) Cabbage	☐ Yes	☐ No
34) Cauliflower	☐ Yes	☐ No
35) Beans	☐ Yes	☐ No
36) Corn	☐ Yes	☐ No
37) Okra	☐ Yes	☐ No
38) Potatoes	☐ Yes	☐ No
39) Onions	☐ Yes	☐ No
40) Celery	☐ Yes	☐ No
41) Other fresh vegetables (ask participant: what other fresh veg. they might have or have had in past seven days)	_____ _____ _____ _____	_____ _____ _____ _____
Canned Vegetables		
42) Peas	☐ Yes	☐ No
43) Tomatoes (whole, cubes, paste, etc.)	☐ Yes	☐ No
44) Carrots	☐ Yes	☐ No
45) Beets	☐ Yes	☐ No
46) Mix vegetables	☐ Yes	☐ No
47) Corn	☐ Yes	☐ No
48) Other canned vegetables (ask participant: what other canned veg. they might have or have had in past seven days)	_____ _____ _____ _____	_____ _____ _____ _____
Frozen Vegetables		
49) Frozen spinach	☐ Yes	☐ No
50) Frozen mix vegetables	☐ Yes	☐ No
51) Frozen peas	☐ Yes	☐ No
52) Frozen corn	☐ Yes	☐ No
53) Other frozen vegetables (participant: what other frozen veg. they might have or have had in past seven days)	_____ _____ _____ _____	_____ _____ _____ _____

Grains		
54) 100% Whole wheat pasta	☐ Yes	☐ No
55) 100% Whole wheat bread	☐ Yes	☐ No
56) Other whole grain product (ask participant: what other whole grain product they might have or have had in past seven days)	_____ _____ _____ _____	_____ _____ _____ _____

Traditional Fruits and Vegetables **(LATINO PARTICIPANTS ONLY)**

Fruits		
1) Avocado (Aguacate)	☐ Yes	☐ No
2) Mango	☐ Yes	☐ No
3) Sapote	☐ Yes	☐ No
4) Guava (Guayaba)	☐ Yes	☐ No
5) Reddish banana (Manzano); Small banana (Niñitos)	☐ Yes	☐ No
Starchy and Other Veg.		
6) Ñame (yam)	☐ Yes	☐ No
7) Yuca (Cassava)	☐ Yes	☐ No
8) Malanga (Yautia)	☐ Yes	☐ No
9) Plaintain	☐ Yes	☐ No

SECTION X: Acculturation (FOR LATINO PARTICIPANTS ONLY)

SCRIPT: I am going to ask you a few questions about your culture while living in America. **Hispanic mothers ONLY**

Short Acculturation Scale for Hispanic Participants
Tell me the generation that best applies to you. Please circle only one.

1st generation = You were born in Mexico or other country.

2nd generation = You were born in USA; either parent was born in Mexico or another country.

3rd generation = You were born in USA, both parents born in USA and all grandparents born in Mexico or other country.

4th generation = You and your parents born in the USA and at least one grandparent born in Mexico or other country with remainder born in the USA.

5th generation = You and your parents born in the USA and all grandparents born in the USA.

1. In general, what language(s) do you read and speak?

(1) Only Spanish	(2) More Spanish than English	(3) Both Equally	(4) More English than Spanish	(5) Only English

2. What was the language(s) you used as a child?

(1) Only Spanish	(2) More Spanish than English	(3) Both Equally	(4) More English than Spanish	(5) Only English

3. What language(s) do you usually speak at home?

(1) Only Spanish	(2) More Spanish than English	(3) Both Equally	(4) More English than Spanish	(5) Only English

4. In which language(s) do you usually think?

(1) Only Spanish	(2) More Spanish than English	(3) Both Equally	(4) More English than Spanish	(5) Only English

5. What language(s) do you usually speak with your friends?

(1) Only Spanish	(2) More Spanish than English	(3) Both Equally	(4) More English than Spanish	(5) Only English

6. In what language(s) are the TV programs you usually watch?

(1) Only Spanish	(2) More Spanish than English	(3) Both Equally	(4) More English than Spanish	(5) Only English

7. In what language(s) are the radio programs you usually listen to?

(1) Only Spanish	(2) More Spanish than English	(3) Both Equally	(4) More English than Spanish	(5) Only English

8. In general, what language(s) are the movies, TV, and radio programs you *prefer* to watch and listen to?

(1) Only Spanish	(2) More Spanish than English	(3) Both Equally	(4) More English than Spanish	(5) Only English

9. Your close friends are:

(1) All Latinos/ Hispanics	(2) More Latinos than Americans	(3) About Half and Half	(4) More Americans than Latinos	(5) All Americans

10. You prefer to go to social gatherings/parties at which the people are:

(1) All Latinos/ Hispanics	(2) More Latinos than Americans	(3) About Half and Half	(4) More Americans than Latinos	(5) All Americans

11. The persons you visit or who visit you are:

(1) All Latinos/ Hispanics	(2) More Latinos than Americans	(3) About Half and Half	(4) More Americans than Latinos	(5) All Americans

12. If you could choose your children's friends, you would want them to be:

(1) All Latinos/ Hispanics	(2) More Latinos than Americans	(3) About Half and Half	(4) More Americans than Latinos	(5) All Americans

13. In which city or town did you grow up?
City or town name: _____

14. Would you say you grew up in a
1. Rural area
2. Urban area or city
3. Semi-urban, a small city or town
88. Don't Know/Unsure

15. How good would you say you're your English speaking skills are?
    1. Very good
    2. Good
    3. Fair
    4. Poor
    5. Very poor
    77. Other (specify): _____

16. (IF NOT BORN IN THE US). How many years, have you lived in the U.S.?: _____

17. (IF NOT BORN IN THE US). What year did you come to U.S.?: _____

18. Do you EAT traditional (Latino) foods or meals?
    1. Yes
    2. No
    77. Other (specify)_____

    18a. If yes, how often do you prepare traditional (Latino) foods?
    1. ___ ___ day
    2. ___ ___week
    3. ___ ____month
    4. Other (specify) _____

19. Do you shop for food at small ethnic stores?
    1. Yes
    2. No
    77. Other (specify)_____

    19a. If yes, how often do you go small ethnic stores?
    ___ ___ day OR ___ ___week OR ___ ____month OR 77. Other (specify) _____

SPANISH LANGUAGE

Cuestionario en persona

Para llevar a cabo una entrevista, los participantes tienen que cumplir con todas las siguientes condiciones:

- *Que tengan 18 años o más de edad.*
- *Que esté embarazada y en el segundo trimestre (de 13 a 27 semanas)*
- *Ser participante del programa WIC*

GUION: Hola, mi nombre es _____. Yo soy parte del estudio de FIP (Food Insecurity Project) de UNCG que se está realizando para entender los hábitos alimentarios durante el embarazo y cualquier preocupación sobre como adquirir alimentos. Si usted está interesada en participar en este estudio, usted tendrá que participar en una entrevista en persona (Durara aproximadamente 1 hora y media) y en una entrevista telefónica como después de dos semanas. También le pediremos autorización para acceder sus archivos médicos. Si está interesada en participar en este estudio pero no puede hacer la entrevista en este momento, le podríamos hacer una cita para otro día. Algunos de los beneficios de participar en este estudio incluyen la oportunidad de expresar su punto de vista acerca de la adquisición de alimentos y su dieta durante el embarazo. Existe un pequeño riesgo al participar en este estudio, usted podría sentirse incomoda al discutir problemas sobre la comida con nosotros. Toda la información colectada no será compartida con nadie más and será completamente confidencial. Si usted se siente incómoda en cualquier momento, usted está libre de terminar su participación en cualquier momento. También, su privacidad será protegida en todo momento. Información que la identifique como: nombre, dirección, teléfono, o fecha de nacimiento. Toda la información obtenida en este estudio es confidencial, a menos que la ley lo requiera. Por favor déjeme saber si tiene alguna pregunta antes de decidir si va a participar.

Entrevistador:

1. Asegúrese de que se cumplan ***TODOS*** los requisitos anteriores para una entrevista. Si no, por favor agradezca a la persona y suspenda.

2. Después de asegurarse que todos los requisitos son cumplidos, pida al participante que firme dos copias de cada formulario:1) Forma de consentimiento; 2) Forma de HIPPA. Para los dos formularios, guarde una copia y de la otra copia al participante.

Información de contacto

A. Hora de Empezar: _____ Hora de Terminar: _____

B. Día: _____
M/D/año

C. ¿Cómo se llama: _____

D. Dirección:
_____

E. Número de teléfono: _____

F. Número de teléfono alternativo: _____

G. ID de WIC del participante: _____ (para acceder los archivos médicos del participante)
_____

H. Fecha de nacimiento_____(m)/_____(d)_____(a)

I. ¿Cuál es su origen étnico?
1. Blanco no hispano
2. Origen hispano (use las secciones para los Hispanos- aculturación y ambiente alimentario encasa)
3. Africano Americano
77. Otro (especifique): _____

J. ¿*En qué idioma desea ser entrevistada?*

1. Inglés
2. Español
3. Ninguna preferencia, inglés o español
77. Otro (especifique): _____

SECCIÓN I. DEMOGRÁFICOS SOCIOS

Información para ser llenada por el entrevistador

I. # de código único del participante: _____

II. Nombre del participante: _____

III. Nombre del entrevistador: _____

IV. Lugar de reclutamiento: _____

---

1. ¿Cuál es su edad? _____ (en años)

2. ¿Cuántos meses de embarazo tiene? _____

3. ¿Cuántas semanas de embarazo tiene? _____

4. ¿Cuál es su fecha de parto? _____
m/d/año

5. ¿Cuál fue el primer día de su último período menstrual? _____/_____/_____
d/m/año
88 No se / no recuerdo
99 se nego

6. ¿Usted planeo este embarazo? 1. Sí 2. No

7. ¿Este es su primer bebé? 1) Sí (pase a la pregunta. 8) 2) No

7a. NO ¿A cuántos niños ha dado a luz? _____

7b. NO ¿Que fecha nació su último hijo. _____ (m/d/año)

7c. NO ¿En que año fue su último embarazo? _____ (año)

8. ¿En dónde está viviendo?
1. En su propia casa/apartamento (SIN los padres, amigos o parientes)
2. Con familiares, padres o amigos (si viven con un familiar por favor especifique su relación con esa persona) _____
77. Otro lugar (especificar) _____
99. Se negó

9. ¿Cuántas personas incluyéndose usted viven en la casa o apartamento? _____

10. Cuántos niños menores de 17 años de edad viven con usted en la casa o apartamento? _____

11. ¿Cuál es el idioma principal que se habla en casa?
    1. Inglés
    2. Inglés y español igualmente
    3. Inglés y otro idioma _____, igualmente
    77. Otro lenguaje (especificar) _____
    99. Se negó

12. ¿Dónde nació? _____, _____
    Ciudad País

13. ¿Cuál es su estado de matrimonio? (Leer las opciones)
    1. Soltera/nunca casada
    2. Casada
    3. Viviendo juntos (no casados)
    4. Divorciada
    5. Viuda
    6. Separada
    77. Otro, especificar_____ 99. Se negó

14. ¿Cuál de las siguientes opciones describe su situación de empleo? (Leer opciones)
    1. Trabajo tiempo completo, 35 horas o más por semana
    2. Trabaja medio tiempo, menos de 35 horas a la semana
    3. Desempleada buscando trabajo
    4. Desempleada no buscando trabajo
    5. Ama de casa
    6. Atendiendo a la escuela
    7. Dueña de una empresa/sociedad
    77. Otro (especificar) _____
    88 No sé
    99. Se negó_____

15. ¿Cuál es su religión? _____

16. ¿Hasta que grado estudio?

a) Escuela Elementaría	d) Un tiempo el la Univ.	g) maestría
b) Secundaria/Bachillerato	e) Carrera técnica	h) Doctorado/medico
c) Escuela Vocacional	f) Licenciatura	

17. ¿Tiene seguro de salud? 1. Sí 2. No

    17 a. **NO**, ¿por qué no tiene seguro médico?
    _____
    17 b. **SI**, ¿qué tipo de seguro médico tienes?
    _____

18. ¿Cuál es la cantidad total de dinero que su hogar recibe mensualmente, incluyendo dinero de todos los **salarios/trabajos, y ayuda del gobierno** que no sea asistencia de alimentos, como el desempleo? $_____Por mes.

19. ¿Cuál es la cantidad total de dinero que OTROS ADULTOS VIVIENDO CON USTED reciben por mes, incluyendo dinero de todos los salarios/trabajo y ayuda del gobierno que no sea asistencia de alimentos, como el desempleo? $_____Por mes.

20. ¿Tienes un carro? 1. Sí 2. No
21. ¿Cual forma de transportación es la que más utiliza?

a) Transporte publico b) Taxi c) Rides de la familia o amigos d) Camina
e) Otra forma

¿Usted o algún miembro de su familia participan en los siguientes programas de comida o asistencia pública?

22. Programa de desayuno escolar	1 Sí	2 No	88 No sé	99 Rechazó
23. Programa de almuerzo escolar	1 Sí	2 No	88 No sé	99 Rechazó
24. Programa de alimentos de verano	1 Sí	2 No	88 No sé	99 Rechazó
25. Asistencia de dinero en efectivo (TANF)	1 Sí	2 No	88 No sé	99 Rechazó
26. Despensas de comida	1 Sí	2 No	88 No sé	99 Rechazó
27. Comedores	1 Sí	2 No	88 No sé	99 Rechazó
28. Beneficios de seguro de ingresos suplementarios (discapacidad)	1 Sí	2 No	88 No sé	99 Rechazó
29. Medicaid (título 19)	1 Sí	2 No	88 No sé	99 Rechazó
30. Sección 8 (asistencia para la vivienda)	1 Sí	2 No	88 No sé	99 Rechazó
31. Si son niños, Healthchoice	1 Sí	2 No	88 No sé	99 Rechazó

32 ¿Recibe cupones de alimento (estampillas de comida/SNAP)? 1. Sí 2. No
a. **SI**, ¿Hace por cuánto tiempo?
a. _____ mes/es
b. _____año/s
b. **SI**, ¿cuánto en estampillas recibe por mes? $_____

33. Hay alguien (más) en su hogar que recibe estampillas de comida
1. Sí 2. No 77.Otro_____

a. **SI**, ¿Cuánto en estampillas recibe esta persona /estas personas al mes? $_____

34. ¿Recibe WIC para sus hijos? 1. Sí 2. No
a. **SI**, ¿cuántos niños? _____
b. **SI**, por cuánto tiempo: _____ (si es más de un niño, escriba el tiempo de participación por cada niño (en meses) **Niño I_____; Niño II**: _____
III_____; IV_____
35. ¿Recibe WIC para usted misma? 1. Sí 2. No
a. **SI**, ¿por cuánto tiempo? _____
b. **SI**, ¿en qué mes de su embarazo empezó a recibir las estampillas? _____

SECCIÓN II. SALUD Y HÁBITOS DE VIDA

1. ¿Ha tenido náuseas en ayunas (náuseas y vómitos) durante su embarazo?
1. Sí 2. No
SI,
1a. ¿Por cuánto tiempo? # de semanas _____O # de meses_____
1B. ¿Esto le ha causado bajar de peso? 1. Sí 2. No
1c. ¿Todavía tienes náuseas en ayunas? 1. Sí 2. No

2. ¿Ha tenido acidez estomacal durante el embarazo? 1. Sí 2. No

SI,
1a. ¿Por cuánto tiempo? # de semanas _____O # de meses _____
1B. ¿Esto le ha causado bajar de peso? 1. Sí 2. No
1c. ¿Todavía tiene acidez estomacal? 1. Si 2. No

3. En general, diría que su estado de salud es (leer opciones):
   1. Malo
   2. más o menos
   3. Bueno
   4. Muy bueno
   5. Excelente
   77. Otra

4. Antes de su embarazo, diría que su salud era (Leer opciones)
   1. Mala
   2. más o menos
   3. Buena
   4. Muy buena
   5. Excelente
   77. Otra

ANTES de su embarazo, algún médico o enfermera le dijo que tenía alguno de los siguientes problemas de salud:

					Notes
5. Anemia	1 Sí	2 No	88 No sé	99 Rechazó	
6. Hipertensión/ presión alta	1 Sí	2 No	88 No sé	99 Rechazó	
7. Problemas del corazón	1 Sí	2 No	88 No sé	99 Rechazó	
8. Depresión	1 Sí	2 No	88 No sé	99 Rechazó	
9. Diabetes	1 Sí	2 No	88 No sé	99 Rechazó	
10. Asma	1 Sí	2 No	88 No sé	99 Rechazó	
11. Cualquier otro problema de salud (ESPECIFIQUE)_____	1 Sí	2 No	88 No sé	99 Rechazó	

EN ESTE MOMENTO o DURANTE EL EMBARAZO,
¿El doctor o enfermera le ha dicho que usted tiene algunos de los siguientes problemas de salud?

					Notes
12. Anemia	1 Sí	2 No	88 No sé	99 Rechazó	
13. Hipertensión gestacional presión alta	1 Sí	2 No	88 No sé	99 Rechazó	
14. Pre- eclampsia/ toxemia	1 Sí	2 No	88 No sé	99 Rechazó	
15. Depresión	1 Sí	2 No	88 No sé	99 Rechazó	
16. Diabetes gestacional	1 Sí	2 No	88 No sé	99 Rechazó	
17. Asma	1 Sí	2 No	88 No sé	99 Rechazó	
18. Cualquier otro problema de salud (ESPECIFICAR)_____	1 Sí	2 No	88 No sé	99 Rechazó	

19. En este momento, ¿estás tomando vitaminas prenatales? 1. Sí 2. No

<u>SI, ¿Con que frecuencia?</u>
19a._____ por día/semanas/meses

20. En este momento, está tomando pastillas de hierro 1. Sí 2. No
<u>SI ¿con qué frecuencia?</u>
20a._____ por día/semanas/meses

21. En este momento, está tomando pastillas de ácido fólico. 1. Sí 2. No
<u>SI ¿qué frecuencia</u>?
21a. _____ por día/semanas/meses

22. ¿Está tomando otros suplementos aparte de las vitaminas prenatales?
1. Sí 2. No
<u>SI, que y cada cuanto</u>
_____ _____por día/semana/mes
_____ _____por día/semana/mes
_____ _____por día/semana/mes

23. ¿Está tomando otros medicamentos aparte de las medicinas prenatales?
23a. **SI**, ¿qué medicinas toma? _____
23b. **SI**, ¿Por qué está tomando estos medicamentos _____

24. Antes del embarazo, ¿fumaba?
1. Sí
2. No
77. Otros
88. No sé / no estoy segura
99. Se negó

25. ¿Ahora (en el embarazo) fuma cigarrillos todos los días, a veces, o nunca?
1. Todos los días
2. A veces
3. Nunca
77. otros
88. No sé / no estoy segura
99. Se negó

25A, **<u>si todos los días o un día</u>**, ¿aproximadamente cuántos cigarrillos fuma por semana?
_____#

26. ¿Antes del embarazo, tomaba (alcohol)?
1. Sí
2. No
3. 88. No sé / no estoy segura
4. 99. Se negó

27. ¿Ahora toma todos los días, a veces, o nunca?
1. Todos los días
2. A veces
3. Nunca
88. No sé / no estoy seguro
99. Se negó
27A. ¿si todos los días o algún día, aproximadamente cuántas bebida/s ha bebido por semana? Un trago es igual que una cerveza de 12 onzas, o un vaso de 5 onzas de vino, o una copa de licor.

28. ¿Generalmente cuánto duerme por la noche entre semana o en días de trabajo?

Horas_____
88. No sé / no estoy segura
99. Se negó

29. ¿Algún médico u otro profesional de salud le ha dicho que tiene problemas al dormir?
1. Sí
2. No
88. No sé / no estoy segura
99. Se negó

SECCIÓN III. MÓDULO DE COMIDA

Guion: Ahora le preguntare sobre sus costumbres de comer y que es lo que come por lo regular.

1. ¿Cocina en casa? 1. Sí 2. No

   1a. NO ¿alguien en su hogar cocina comida? 1. Sí 2. No

   1b. SI ¿cuantas veces usted cocina en casa? _____ por semana o_____ al mes

2. ¿Come en restaurantes de comida rápida (ej.: McDonalds, Wendys, etc.). 1. Sí 2. No

   2a. SI _____ veces por semana o _____ al mes.

3. ¿Come en algún otro restaurante (Olive Garden, TGIF, Golden Corral, Chipotle, o restaurantes locales de otros países). 1. Sí 2. No

   3a. SI _____ veces por semana o _____ al mes.

Durante el embarazo,

Comidas	Usted come...	# de veces durante la semana	Razones por no comer: 1) Nauseas en ayunas 2) No tengo suficiente tiempo 3) Náuseas 4) Ya tengo la costumbre de no comer 5) Generalmente no tengo hambre en ese momento 6) No hay suficiente comida 7) No como para poder guardar comida para las siguiente comidas Otro (explique):
4. Desayuno	1. Sí 2. No		
5. El almuerzo	1. Sí 2. No		
6. La cena	1. Sí 2. No		
7. Refrigerios	1. Sí 2. No		

8. ¿Ha tenido antojos durante el embarazo? 1. Sí 2. No

8a. **SI,** ¿Qué antojos han tenido durante su embarazo?

_____

9. ¿Hay comidas que ya no le gustan ahora que está embarazada? 1. Sí 2. No

9a.. **SI,** ¿qué comidas no le gustan ahora que está embarazada?

_____

*** Desde su embarazo, cuántas veces al día, semana, o mes come o bebe:**

ponga un número en solo una de las columnas	#veces al día	#veces a la semana	#veces por mes	88. No se/no estoy segura	99. Se negó
10. Soda regular o con azúcar					
11. ¿Bebidas endulzadas con azúcar? (Kool-aid, limonada y té dulce, Gatorade, Red Bull)					
12. ¿Jugos 100% de pura fruta? No incluyen las bebidas con sabor a fruta o con adición de azúcar o frutas					
13. ¿Fruta? Frutas frescas, congeladas, o enlatadas					
14. Frijoles cocidos o enlatado? como el frijol frito, cocido, negro, garbanzo, frijoles en sopa, soja/soya					
15. ¿Verduras verdes oscuras? por ejemplo, brócoli o verdes oscuras con hojas, incluyendo lechuga, planta de acelga o col/repollo, espinacas					
16. ¿OTRAS verduras? Ejemplos de otras verduras incluye tomates, jugo de tomate o jugo V-8, maíz, berenjenas, guisantes, lechuga, col/repollo y papas blancas que no son fritas como las papas horneadas o en puré					
17. ¿Verduras de color naranja? ¿cómo camote, calabaza, calabaza de invierno, o zanahorias?					

SECCIÓN IV. ACTIVIDAD FÍSICA

Guion: Las siguientes preguntas son sobre ejercicio y actividad física que se realiza haciendo actividades diarias.

1. ¿Su día incluye hacer actividades trabajosas o que causan un poco de aumento de respiración o pulso del corazón, como caminar rápido o cargar cosas **ligeras,** o posiblemente subir escaleras?
   1. Sí
   2. No
   88. No sé / no estoy segura
   99. Se negó

1a. SI, ¿en una semana típica, cuantos días hace actividades que requieren trabajo como subir escaleras, o cargar cosas ligeras, etc.?

Número de días___
88. No sé / no estoy segura
99. Se negó

1B. SI, en esos días, cuánto tiempo pasa haciendo actividades físicas como subir escaleras...u otras actividades físicas en su trabajo?

Ponga el número de minutos u horas, _____minutes u _____horas
88. No sé / no estoy seguro
99. Se negó

*GUION: Las preguntas siguientes **excluyen** las actividades físicas que usted ya ha mencionado. Ahora me gustaría preguntarle específicamente de la cantidad de tiempo que usted camina. ¿Por ejemplo, camina para ir al trabajo, para ir de compras, o a la escuela?*

2. ¿En una semana típica camina para llegar y regresar de lugares?
1. Sí
2. No
88. No sé / no estoy segura
99. Se negó

2a. **SI,** ¿en una semana típica, cuántas veces camina al trabajo, a la escuela, o para ir de compras?
____ Días
88. No sé / no estoy segura
99. Se negó

2B. **SI,** en esos días, cuánto tiempo camina o cuánto tiempo pasa caminando _____minutes u _____horas
88. No sé / no estoy seguro
99. Se negó

Guion: Las preguntas siguientes excluyen las actividades de trabajo y transporte que usted ya ha mencionado. Ahora me gustaría preguntarte sobre deportes, ejercicio, y actividades recreativas.

3. ¿En una semana típica hace algún deporte, ejercicio, o ejercicios que causa un pequeño aumento en la respiración o pulso como caminar rápido, nadar, o bailar por lo menos 10 minutos sin parar?
1. Sí
2. No
88. No sé / no estoy segura
99. Se negó

3a. **SI,** en una semana típica, cuántos **días** hace ejercicio, o practica deportes
Número de días_____
88. No sé / no estoy segura
99. Se negó

3B. **SI,** ¿Cuánto **tiempo** pasa haciendo deportes, ejercicio, o actividades recreativas en un día típico?
_____minutes u _____horas
88. No sé / no estoy seguro
99. Se negó

Guion: Ahora me gustaría preguntarle sobre actividades que se hacen sentada como viendo la televisión, vídeos, o pasar tiempo en una computadora, o sentada tranquilamente, o para relajarse.

4. En una semana típica, cuántos días se sienta simplemente para relajarse, o para estar en la internet, ver televisión, o jugar juegos de computadora?
   Ningún (0 días)
   Número de días_____
   88. No sé / no estoy segura
   99. Se negó

   4a. **si reporto el número de días:** Mas o menos por regular, cuántas horas o minutos pasa viendo televisión, jugando videojuegos, o relajándose, en un día típico.
   _____minutos u _____horas
   88. No sé / no estoy seguro
   99. Se negó

SECCIÓN V. LA INSEGURIDAD DE COMIDA DURANTE EL EMBARAZO

Guion: Ahora voy a leer varias declaraciones con respecto a la comida. Al escuchar estas declaraciones, por favor dígame si ha experimentado tales situaciones durante el embarazo.

H1. DURANTE el embarazo, usted u otros adultos en su hogar se han preocupado de que su comida se acabe antes de tener dinero para comprar más
1. Sí
2. No
88/99 DK o negado

H2. ¿DURANTE el embarazo, ha pasado alguna situación en donde la comida que usted u otros adultos en el hogar compraron no les alcanzo, y no había dinero para comprar más?
1. Sí
2. No
88/99 DK o negado

H3. DURANTE el embarazo, hubo algún tiempo cuando usted o los otros adultos en el hogar no tenían suficiente dinero para comer comidas balanceadas (ej., comidas sanas y variadas)?
1. Sí
2. No
88/99. DK o negado

AD1. ¿DURANTE el embarazo, hubo un tiempo cuando usted u otros adultos en el hogar tuvieron que reducir el tamaño de las comida, o tuvieron que dejar de comer algunas comidas porque no había suficiente dinero para comprar comida?
1. Sí
2. No
88/99. DK o negado

AD1a. **Sí**, ¿cuántas veces ha ocurrido esto?
de veces_____ por semana o _____ por mes
88/99. DK o negado

AD2. DURANTE el embarazo, ¿alguna vez comió menos de lo que sentía que debería de comer porque no había suficiente dinero para comprar comida?
1. Sí
2. No
88/99. DK o negado

AD3. DURANTE el embarazo, ha tenido hambre pero no comió porque no había suficiente dinero para comprar comida?
1. Sí
2. No

88/99. DK o negado

AD4. DURANTE el embarazo, ¿ha perdido peso porque no había suficiente dinero para comprar comida?
1. Sí
2. No
88/99. DK o negado

AD5. DURANTE el embarazo, usted u otros adultos en su hogar no comieron durante todo el día porque no había suficiente dinero para comprar comida?
1. Sí
2. No
88/99. DK o negado

AD5a. **SI,** Cuántas veces ha ocurrido esto?
de veces por semana _____ o _____por mes
[] DK o negado

Preguntas acerca del niño: Si el participante reporto tener un niño/a o niños menores de 18 años en el hogar, haga las siguientes preguntas; o pase al ***Final del módulo de inseguridad de comida***

SELECCIONE APROPIADAMENTE DEPENDIENDO DEL NÚMERO DE NIÑOS EN EL HOGAR.

Preguntas referidas al niño:
Guion: Ahora voy a preguntar sobre la situación alimentaria de sus hijos que viven en el hogar que son menores de 18 años.

CH1. ¿EN LOS ULTIMOS MESES O DESDE SU EMBARAZO, tuvo que comprar solamente comidas de bajo costo para darle de comer a su niño/a o cualquiera de los niños porque no había dinero para comprar comida?
1. Sí
2. No
88/99. DK o negado

CH2. ¿EN LOS ULTIMOS MESES O DESDE SU EMBARAZO, tuvo dificultades para alimentar saludablemente a su hijo/a o cualquiera de los niños, porque no podía comprar comida?
1. Sí
2. No
88/99. DK o negado

CH3. ¿EN LOS ULTIMOS MESES O DESDE SU EMBARAZO, hubo un tiempo cuando su niño/a o alguno de los niños no comió lo suficiente porque no pudo comprar más comida?
1. Sí
2. No
88/99. DK o negado

CH4. ¿EN LOS ULTIMOS MESES O DESDE SU EMBARAZO, tuvo que reducir la cantidad de comida que le dio a su niño /a o alguno de los niños porque no había suficiente dinero para comprar comida?
1. Sí
2. No
88/99. DK o negado

CH5. ¿EN LOS ULTIMOS MESES O DESDE SU EMBARAZO, usted o unos de los niños tuvieron que omitir comidas porque no había suficiente dinero para comprar la comida?
1. Sí
2. No
88/99. DK o negado

CH5a. **SI,** ¿Cuántas veces ha ocurrido esto?
de veces: _____por semana O _____por mes
[] DK o negado

CH6. ¿EN LOS ULTIMOS MESES O DESDE SU EMBARAZO, hubo un tiempo cuando su niño/a o niños tubo/tubieron hambre pero no tenía dinero para comprar más comida?

1. Sí
2. No
88/99. DK o negado

CH7. ¿EN LOS ULTIMOS MESES O DESDE SU EMBARAZO, hubo un tiempo cuando su niño/a o niños no comieron en todo un día porque no había suficiente dinero para comprar comida?

1. Sí
2. No
88/99. DK o negado

SECCIÓN VI. RECORDATORIO DE 24 HORAS

Entrevistador haciendo recordatorio de 24 horas: _____

Nombre del participante: _____

Código del participante: _____

Fecha: _____

fecha de recordatorio de 24 horas y día de la semana: _____ / _____ / _____;

M/D/A

_____

Día de la semana

GUION: Ahora me gustaría hacerle una entrevista acerca de todo lo que comió en las últimas 24 horas. Nos tomara aproximadamente 20-30 minutos. Le recuerdo que su nombre y respuestas serán confidenciales.

¿Me podría decir que es lo que bebió durante todo el día? Por favor empiece desde el momento que se despertó hasta el momento en que usted se fue a dormir.

Notas para el entrevistador: 1ero. Documentar la comida/bebidas y la hora en que fueron consumidas.
2ndo. Documentar la cantidad que fue consumida y determinar si algo no se documentó en el 1er paso.
3ero. Documente los ingredientes de cada comida/bebidas (Así como la cantidad de azúcar que se usó si es que tomo te/café, el tipo de pan consumido si es que comió un sándwich, o si el participante uso algún condimento como mostaza o mayonesa en la comida. Pregúnteles a las participantes si ellas quieren añadir o quitar algo y empiece por preguntar qué es lo primero que comió en vez de preguntar qué es lo que comió en el desayuno o almuerzo. También pregunte si se comió toda la cantidad mencionada.

COMIDA	TIEMPO	LUGAR	COMIDA O BEBIDA	PORCIÓN
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

SECCIÓN VII. IMC ANTES DEL EMBARAZO

1. ¿Cuánto mide de altura sin zapatos?
   Altura: _____ Pies _____ pulgadas O _____ metros
   88. DK/no segura
   99. Se negó

2. ¿Y cuánto pesaba sin zapatos antes del embarazo?

   Peso: _____libras o _____kilogramos
   88. No sé / no estoy seguro
   99. Se negó

3. ¿Sabe aproximadamente, cuánto pesas ahora?
   Peso: _____libras o _____ kilogramos
   88. No sé / no estoy seguro
   99. Se negó

4. Siente que ha subido demasiado, muy poco, o la cantidad justa de peso, durante el embarazo?

   1. Demasiado
   2. Muy poco
   3. Cantidad justa
   88. No sé

5. ¿Cuánto peso cree que debe aumentar durante el embarazo? _____ lbs.

6. ¿Ha intentado perder de peso durante el embarazo? 1. Sí 2. No

SECCIÓN VIII: APOYO SOCIAL

GUION: ahora le preguntare sobre su sistema social de apoyo.

¿Ha prestado o ha pedido dinero prestado a familiares, vecinos, o amigos?	1 Sí	2 No	88 No sé	99 Rechazó
¿Ha prestado cosas como comida, artículos para el hogar o ropa, a vecinos, familiares, o amigos?	1 Sí	2 No	88 No sé	99 Rechazó
¿Tienes acceso a que le den crédito en pequeñas tiendas?	1 Sí	2 No	88 No sé	99 Rechazó
¿Puedes contar con alguien, por ejemplo, vecinos, familiares, o amigos, fuera de su hogar para ayudarle con mandados (como cuidar niños o cocinar)?	1 Sí	2 No	88 No sé	99 Rechazó
¿Usted ayuda a amigos, familiares, o vecinos con mandados (como cuidar niños o cocinar) fuera de su hogar?	1 Sí	2 No	88 No sé	99 Rechazó

SECCIÓN IX. AMBIENTE DE COMIDA EN CASA

GUION: En los últimos siete días, ¿cuáles de las siguientes cosas tiene o ha tenido en su casa?

100% Jugos de frutas		
1) Jugo de manzana	o Sí	o No
2) Jugo de naranja	o Sí	o No
3) Jugo de uvas	o Sí	o No
4) Otros jugos de fruta que son 100% natural (pregúntele al participante que otros jugos de fruta 100% natural que podrían haber tenido en los últimos siete días).	_____ _____ _____ _____	_____ _____ _____ _____
Frutas frescas		
5) Manzanas	o Sí	o No
6) Naranjas	o Sí	o No
7) Plátanos	o Sí	o No
8) Uvas	o Sí	o No
9) Melón	o Sí	o No
10) Peras	o Sí	o No
11) Fresas	o Sí	o No
12) Duraznos	o Sí	o No
13) Sandía	o Sí	o No
14) Otras frutas frescas (pregúntale al participante: Cuales otras frutas frescas, tal vez tuvieron o han tenido en los últimos siete días)	_____ _____ _____ _____	_____ _____ _____ _____
Frutas enlatadas		
15) Peras (enteras / mitades) en jugo 100% natural	o Sí	o No
16) Puré de manzana/ natural, sin azúcar	o Sí	o No
17) Naranjas en jugo de fruta 100%	o Sí	o No
18) Cóctel de frutas/ensalada en jugo 100% natural (sin azúcar)	o Sí	o No
19) Cubitos de piña o mascados en jugo	o Sí	o No
20) Otras frutas enlatadas (pregúntele al participante: Qué otras frutas enlatadas, tuvieron o creen que tuvieron en los últimos siete días)	_____ _____ _____ _____	_____ _____ _____ _____

Frutas secas		
21) Pasas secas (negras o doradas)	o Sí	o No
22) Albaricoques secos	o Sí	o No
23) Frutas secas y mezcladas	o Sí	o No
24) Ciruelas secas	o Sí	o No
25) Otras frutas secas (pregúntale al participante: Qué otras frutas secas, creen que tuvieron o tuvieron en los últimos siete días)	_____ _____ _____ _____	_____ _____ _____ _____
Frutas congeladas		
26) Fresas congeladas o cualquier otras bayas/berries	o Sí	o No
27) Otras frutas congeladas como mangos, piña etc.	_____ _____ _____ _____	_____ _____ _____ _____
Verduras frescas		
28) Tomates	o Sí	o No
29) Zanahorias	o Sí	o No
30) Verduras verdes como la berza, col rizada, o mostaza verde	o Sí	o No
31) Brócoli	o Sí	o No
32) Chiles dulces	o Sí	o No
33) Repollo	o Sí	o No
34) Coliflor	o Sí	o No
35) Frijoles	o Sí	o No
36) Elote/Maíz	o Sí	o No
37) Okra	o Sí	o No
38) Papás	o Sí	o No
39) Cebollas	o Sí	o No
40) Apio	o Sí	o No
41) Otros vegetales frescos (pregúntale al participante: Cuales otras verduras frescas, tuvo o cree que tuvo en los últimos siete días)	_____ _____ _____ _____	_____ _____ _____ _____
Vegetales de lata	o Sí	o No
42) Chicharos/guisantes	o Sí	o No
43) Tomates (enteros, en cubos, pasta, etc.)	o Sí	o No
44) Zanahorias	o Sí	o No
45) Remolacha	o Sí	o No
46) Verduras mescladas/mix de verduras	o Sí	o No
47) Elote	o Sí	o No
48) Otras frutas enlatadas (pregúntele al participante: que otras frutas enlatadas comieron o han comido en los últimos siete días).		

Verduras congeladas		
49) Espinaca congelada	o Sí	o No
50) verduras mescladas y congeladas	o Sí	o No
51) Guisantes/chicharos congelados	o Sí	o No
52) Elote congelado	o Sí	o No
53) Otros vegetales congelados (pregúntale al participante: Qué otros vegetales congelados, tal vez tienen o tuvieron en los últimos siete días)	_____ _____ _____ _____	_____ _____ _____ _____
Granos		
54) pasta de trigo integral 100% natural	o Sí	o No
55) Pan de trigo entero 100%natural 56) Otro tipo de pan de granos enteros	o Sí	o No

Frutas y Vegetales Tradicionales (sólo participantes latinos)

Frutas		
1. Aguacate	o Sí	o No
2. Mango	o Sí	o No
3. Sapote	o Sí	o No
4. Guayaba	o Sí	o No
5. Plátano rojizo (Manzano); Plátano pequeño (Niñitos)	o Sí	o No
Verduras con almidón y otros.		
6. Ñame (yam)	o Sí	o No
7. Yuca	o Sí	o No
8. Malanga (Yautia)	o Sí	o No
9. Plátanos	o Sí	o No

SECCIÓN X. ACULTURACIÓN (PARA PARTICIPANTES LATINOS SOLAMENTE)

GUION: Voy hacerle unas preguntas acerca de su cultura en relación al tiempo que ha vivido en los Estados Unidos. ** Las madres hispanas solamente **

Escala pequeña de aculturación para las participantes hispanas

Dígame la generación que mejor se aplica a usted. Seleccione una respuesta nada más.

Primera generación = usted nació en México u otro país.

Segunda generación = usted nació en los Estados Unidos; Cualquier de los padres nació en México u otro país.

Tercera generación = usted nació en los Estados Unidos, ambos padres nacidos en los Estados Unidos, y todos los abuelos nacidos en México o otro país.

Cuarta generación = Usted y sus padres nacieron en los Estados Unidos y al menos un abuelo nacido en México u otro país con el resto de su familia nacida en los Estados Unidos.

Quinta generación =usted y sus padres nacieron en los Estados Unidos y todos los abuelos nacieron en los Estados Unidos.

1. ¿En general, qué idioma(s) lee y habla?

(1) Sólo Español	(2) Más español que inglés	(3) Ambos igualmente	(4) Más inglés que Español	(5) Sólo en inglés

2. ¿Cuáles eran los idioma(s) que usted usada cuando era niña?

(1) Sólo Español	(2) Más español que inglés	(3) Ambos igualmente	(4) Más inglés que Español	(5) Sólo en inglés

3. ¿Qué idioma(s) generalmente habla en casa?

(1) Sólo Español	(2) Más español que inglés	(3) Ambos igualmente	(4) Más inglés que Español	(5) Sólo en inglés

4. ¿En qué idioma(s) piensa?

(1) Sólo Español	(2) Más español que inglés	(3) Ambos igualmente	(4) Más inglés que Español	(5) Sólo en inglés

5. ¿Qué idioma(s) normalmente habla con sus amigos?

(1) Sólo Español	(2) Más español que inglés	(3) Ambos igualmente	(4) Más inglés que Español	(5) Sólo en inglés

6. ¿En qué idioma(s) son los programas de televisión que usted ve por regular?

(1) Sólo Español	(2) Más español que inglés	(3) Ambos igualmente	(4) Más inglés que Español	(5) Sólo en inglés

7. ¿En qué idioma(s) son los programas de radio que escucha regularmente?

(1) Sólo Español	(2) Más español que inglés	(3) Ambos igualmente	(4) Más inglés que Español	(5) Sólo en inglés

8. ¿En general, qué idioma(s) son las películas, TV, y programas de radio que ***prefiere*** ver y escuchar?

(1) Sólo Español	(2) Más español que inglés	(3) Ambos igualmente	(4) Más inglés que Español	(5) Sólo en inglés

9. Sus amigos más cercanos son:

(1) Todos son Latinos / Hispanos	(2) Más Latinos que Americanos	(3) Aproximadamente mitad y mitad	(4) Más Americanos que Latinos	(5) Todos son Americanos

10. Prefiere ir a reuniones/fiestas sociales donde la gente es:

(1) Todos son Latinos / Hispanos	(2) Más Latinos que Americanos	(3) Aproximadamente mitad y mitad	(4) Más Americanos que Latinos	(5) Todos son Americanos

11. Las personas que visita o que la visitan son:

(1) Todos son Latinos / Hispanos	(2) Más Latinos que Americanos	(3) Aproximadamente mitad y mitad	(4) Más Americanos que Latinos	(5) Todos son Americanos

12. Si usted podría elegir los amigos de sus hijos, que quisiera que fueran:

(1) Todos Latinos / Hispanos	(2) Más Latinos que Americanos	(3) Aproximadamente mitad y mitad	(4) Más Americanos que Latinos	(5) Todos Americanos

13. ¿En qué ciudad o pueblo creció?
Nombre de ciudad o pueblo: _____

14. Diría que creció en:
1. Rancho o Pueblo pequeño
2. Área urbana o ciudad
3. medio urbana, una pequeña ciudad o pueblo

88. DK

15. ¿En su opinión que tal diría que hablas inglés?
1. Muy bien
2. Bien
3. Más o menos
4. Mal
5. Muy Mal
77. Otros (especifica) _____

16. (SI NO NACIÓ EN LOS ESTADOS UNIDOS). ¿Cuántos años, ha vivido en los Estados Unidos: _____

17. (SI NO NACIÓ EN LOS ESTADOS UNIDOS). ¿En qué año vino a los Estados Unidos?: _____

18. ¿Usted come comidas tradicionales (comida Latina)?
1. Sí
2. No
77. Otros (especificar) _____

18a. SI, ¿con qué frecuencia prepara comida tradicional (Latina)?
1. _____ día
2. _____semana
3. _____mes
4. Otros (especificar) _____

19. ¿Usted va de compras en pequeñas tiendas étnicas (ej. Tiendas mexicanas)?
1. Sí
2. No
77. Otros (especificar) ___

19a. Sí, ¿con qué frecuencia vas pequeñas tiendas étnicas?
1.al día _____a la semana _____al mes o 77. Otros (especificar) ___

APPENDIX B

APPROVED RECRUITMENT SCRIPTS

Recruitment Script (English):

- You are being asked if you want to be in a research study. This study is carried out to understand daily food habits during pregnancy and what are your concerns related to food affordability (food insecurity).
- You have been picked for this study because you are in second trimester of pregnancy, older than 18, receiving WIC.
- As a participant in the study, you will be asked to participate in-person and telephone interviews and permission to access your medical records.
- You will receive in total $40.00 worth gift cards after completing two interviews: a $25 gift card for one in-person 60-minute interview about your current lifestyle and eating habits and a $15 gift card for a second 20-minute phone interview follow-up on your eating habits.
- There is no direct benefit to participants.
- There is a minimal risk for participating in this study; you may feel uncomfortable discussing food related issues with us. However, any information we collect will not be shared with anyone. All information in this study is strictly confidential. If you feel uncomfortable, you are free to discontinue participation anytime during the study.
- Your privacy will be protected by deleting any identifiable information such as name, address or phone number. All information obtained in this study is strictly confidential unless disclosure is required by law.
- You should ask any questions you have before making up your mind.
- If you decide you want to be in the study you will need to give written consent or sign the consent form; we will give it to you.

Recruitment Script (Spanish)
Guion de reclutamiento:

- Le estamos preguntando si desea participar en un estudio de investigación. Este estudio se está haciendo para comprender sus hábitos alimentarios y también para saber cuáles son sus preocupaciones relacionadas con el acceso a alimentos durante el embarazo (Inseguridad alimentaria).
- Usted ha sido escogida para participar en este estudio porque usted está en su segundo trimestre de embarazo, tiene 18 años o más de edad, y está recibiendo WIC.
- Como participante en este estudio, se le pedirá que participe en dos entrevistas, una en persona y por teléfono. También necesitamos permiso para tener acceso a sus expedientes médicos.
- Usted recibirá un total de $ 40.00 por valor de tarjetas de regalo después de completar dos entrevistas: una tarjeta de regalo de $ 25 para unos 60 minutos entrevista en persona acerca de su estilo de vida actual y los hábitos alimentarios y una tarjeta de regalo de $15 para unos 20 minutos teléfono segunda entrevista de seguimiento en sus hábitos alimenticios.
- El beneficio de participar en este estudio incluye tener la oportunidad de expresar su opinión y punto de vista en relación con el acceso a alimentos y hábitos alimentarios durante el embarazo.

- Existe un riesgo mínimo al participar en este estudio, usted puede sentirse incómoda hablando sobre problemas relacionadas con su alimentación. No obstante, la información que usted nos dara no será compartida con nadie. Toda la información de este estudio es estrictamente confidencial. Si usted se siente incómoda, usted tiene derecho de terminar su participación en este estudio en cualquier momento.

- Su privacidad será protegida al eliminar cualquier información personal como nombre, dirección, o número de teléfono. Toda la información obtenida en este estudio es estrictamente confidencial, a menos que compartirla sea requerida por la ley.

- Usted tiene el derecho de hacer cualquier pregunta antes de tomar una decisión.

- Si decide participar en este estudio, usted tendrá que firmar la hoja de consentimiento que nos autoriza a hacerle preguntas.

APPENDIX C

CONSENT FORMS

CONSENT TO ACT AS A HUMAN PARTICIPANT

Project Title: **FIP Study**

Food Insecurity: How is it related to home food environment, pregnancy and birth outcomes among WIC pregnant women?

Project Director: Dr. Jigna M. Dharod

Participant's Name: _____

What is the study about?
This is a research project. This study is conducted to understand how food access and shortage during pregnancy can affect weight gain and overall health during pregnancy. We would like to know your dietary habits and home food environment. Also, we would like know what are your concerns related to food affordability (food insecurity). Your participation is voluntary.

Why are you asking me?
This study is specifically conducted with pregnant mothers who are 18 years or older, 4 to 6 months pregnant (13 to 27 weeks), and receiving WIC.

What will you ask me to do if I agree to be in the study?
If you agree, we would like to interview you for approximately 60 minutes. During an interview we will ask you questions to collect personal information such as your age, education, income, your dietary habits using 24-hour recall and your experience regarding food insecurity or food affordability. In addition to this interview, one of our team members will contact you over the telephone in the next few days to do second 24 hour recall We will also access your pregnancy medical records to see how much weight you gained during pregnancy, weight of your newborn and related information.

Is there any audio/video recording?
There will be NO audio or video recording.

What are the dangers to me?
There is a minimal risk for participating in this study, you may feel uncomfortable discussing food related issues with us. However, if you feel uncomfortable anytime, you are free to discontinue your participation in this study.

If you have questions, want more information or have suggestions, please contact Danielle Nunnery who may be reached at (336) 613-6994 or by email at dlnunner@uncg.edu. You can also contact Jigna Dharod who may be reached at (336) 334-9708 or email jmdharod@uncg.edu.

If you have any concerns about your rights, how you are being treated, concerns or complaints about this project or benefits or risks associated with being in this study please contact the Office of Research Integrity at UNCG toll-free at (855) 251-2351.

Are there any benefits to me for taking part in this research study?
There are no direct benefits to participants in this study.

What are the benefits to the study?
This study may help us to understand what nutrition education and related programs will help to improve the health status of pregnant women.

Will I get paid for being in the study? Will it cost me anything?
After completing the first in-person interview, you will receive a gift card worth $25.00. Upon completion of a telephone interview, you will receive a gift card worth $ 15.00 as an incentive. If you complete both parts of the study, you will earn a total of $ 40.00

How will you keep my information confidential?
When you agree to be in the study, you will be given an ID number that is unique to you. The master file that has the unique id, your name, your consent form, and other identifiable information will be stored in a locked cabinet. Interview documents (in-person and telephone), health records with your unique id will be stored in a locked file cabinet in a locked office. All computer files will be stored on password protected computers. The master file will be stored in a separate location, away from any of the other data collected for this study.

Data collected on you will be destroyed after 3 years. All information obtained in this study is strictly confidential unless disclosure is required by law. Researchers are mandated to report child and elder abuse.

What about new information/changes in the study?
If significant new information relating to the study becomes available which may relate to your willingness to continue to participate, this information will be provided to you.

What if I want to leave the study?
You have the right to refuse to participate or to withdraw at any time, without penalty. If you do withdraw, it will not affect you in any way. Specifically, it will not affect your relationship with the WIC or the services you receive at the WIC. If you choose to withdraw, you may request that any of your data which has been collected be destroyed unless it is in a de-identifiable state.

Voluntary Consent by Participant:
By signing this consent form you are agreeing that you read, or it has been read and explained to you, and you fully understand the contents of this document and are openly giving consent to take part in this study. All of your questions concerning this study have been answered. By signing this form, you are agreeing that you are 18 years of age or older and are agreeing to participate in this study described to you by _____.

Signature: _____ Date: _____

SPANISH CONSENT FORM

Consentimiento para Actuar Como un Participante

Título del proyecto: FIP Estudio

La Inseguridad Alimentaria: ¿Cómo se relaciona con el ambiente alimentario en casa, el embarazo y entre los resultados de los partos de las mujeres embarazadas que reciben WIC?

Directora del proyecto: Dra. Jigna M. Dharod

Nombre del participante: _____

¿Acerca de que es este estudio?
Este es un proyecto de investigación. Este estudio se está realizando para comprender cómo la inseguridad alimentaria afecta el peso y la salud en general durante el embarazo. Nos gustaría saber acerca de sus hábitos alimentarios y de su ambiente de comida en casa. También, nos gustaría saber cuáles son sus preocupaciones relacionadas con el acceso a alimentos (inseguridad alimentaria). Su participación es voluntaria.

¿Por qué me están preguntando a mí?
Este estudio es específicamente para las mujeres embarazadas que tienen 18 años de edad o más, 4 a 6 meses (13-27 semanas) de embarazo, y que participan en el programa de WIC.

¿Qué me dirá que haga si deseo participar en el estudio?
Si está de acuerdo, nos gustaría hablar con usted durante unos 60 minutos. Durante la entrevista nosotros le haremos unas preguntas para recopilar información personal, como su edad, educación, ingresos económicos, hábitos alimentarios usando un recordatorio de 24 horas, y su experiencia con la inseguridad alimentaria o capacidad para adquirir alimentos. Además de esta entrevista, un miembro de nuestro equipo se pondrá en contacto con usted por teléfono en los próximos días para hacer un segundo recordatorio de 24 horas. Nosotros también tendremos acceso a sus archivos médicos para ver cuánto ha subido de peso durante su embarazo, el peso de su recién nacido, e información relacionada.

¿Hay alguna grabación de audio/vídeo?
No habrá grabación de audio o vídeo.

¿Cuáles son los peligros de participar en este estudio?
Existe un riesgo mínimo para participar en este estudio, usted puede sentirse incómoda hablando de sus hábitos alimentarios con nosotros. Sin embargo, si usted se siente incómoda usted en cualquier momento puede terminar su participación en este estudio.

Si tiene preguntas, desea más información, o tiene alguna sugerencia, por favor contacte a Danielle Nunnery, llamando al (336) 613-6994 o por correo electrónico a dlnunner@uncg.edu. También puede contactar a Jigna Dharod llamando al (336) 334-9708 o por correo electrónico jmdharod@uncg.edu.

Si usted tiene alguna preocupación acerca de sus derechos, de cómo usted está siendo tratada, quejas sobre este proyecto, y los beneficios o riesgos para participantes por favor contacte a la Oficina de Investigación de Integridad de UNCG. Puede llamar gratis al (855) 251-2351.

¿Hay algún beneficio para mí por participar en esta investigación?
No hay un beneficio directo para los participantes en este estudio.

¿Cómo se beneficiara este estudio de mi participación?
Este estudio nos puede ayudar a comprender que educación de nutrición y otros programas relacionados ayudarían a mejorar la salud de la mujer durante el embarazo.

¿Se me pagara por participar en el estudio? ¿Me costara algo?
Como un incentivo, después de completar la primera entrevista en persona, usted recibirá una tarjeta de regalo de $ 25.00. Al finalizar la segunda entrevista por teléfono, usted recibirá una tarjeta de regalo de $ 15.00. Si usted completa ambas partes del estudio, usted recibirá un total de $40.00 en tarjetas de regalo.

¿Cómo se mantendrá mi información confidencial?
Cuando usted se compromete a participar en este estudio, se le asignara un número de identificación exclusivo. El archivo maestro que tiene su número exclusivo de ID, su nombre, su formulario de consentimiento, y otra información que la identifique se almacenaran en un armario cerrado bajo llave. Documentos de la entrevista (en persona y teléfono) y su expediente de salud con su número único serán almacenados en un archivo bajo llave en una oficina que también estará bajo llave. El archivo maestro se almacenará en un lugar separado, lejos de los otros datos que se colectaron en este estudio. Los datos que se colectaron acerca de usted serán destruidos después de 3 años. Toda la información obtenida en este estudio es estrictamente confidencial a menos que sea requerida por la ley compartirlos. Los investigadores están obligados a reportar cualquier abuso de ancianos y niños.

¿Qué pasa si hay nueva información y cambios en el estudio?
Si información nueva e importante relacionada a usted y a su voluntad de seguir participando es encontrada, esta información se le proporcionara.

¿Qué pasa si quiero dejar de participar en el estudio?
Usted tiene el derecho de negarse a participar o dejar de participar en el estudio en cualquier momento, sin alguna consecuencia. Si no desea participar, esto no le afectará en modo alguno. En concreto, esto no afectará su relación con el programa WIC o los servicios que usted recibe en el WIC. Si desea terminar su participación, usted puede solicitar que sus datos recopilados sean destruidos a menos que sea información que no se puede asociar con usted.

Consentimiento voluntario por parte del participante: Al firmar este formulario de consentimiento usted acepta que leyó, o que se le ha leído y explicado, y que usted entiende completamente el contenido de este documento y abiertamente desea participar en este estudio. Que todas las preguntas relacionadas a este estudio han sido contestadas. Al firmar este formulario, usted acepta que tiene 18 años de edad o más y está de acuerdo en participar en este estudio que fue descrito por _____.

Firma del participante: _____ Fecha: _____

GUILFORD COUNTY DEPARTMENT OF PUBLIC HEALTH
COMPLIANCE PLAN: HIPAA AUTHORIZATION

AUTHORIZATION TO DISCLOSE HEALTH INFORMATION

Patient Name _____ Date of Birth_____

Patient SS #__**Leave this blank**_____

I _____
hereby authorize
(Patient or Personal Representative)

The Guilford County Department of Public Health to disclose specific health information from the records of the above named patient to:

Recipient Name: **Jigna M. Dharod**

Recipient Address: **339 Stone Bldg, UNCG, NC 27412**

Recipient Phone/Fax: **336 334 9708**

for the specific purpose(s) as listed below:

To conduct study titled: Food Insecurity: How is it related to home food environment, pregnancy and birth outcomes among WIC pregnant women? The UNCG Principal Investigator of this study is: Jigna M. Dharod, Assistant Professor, Nutrition. The main purpose is to understand how food insecurity affects health status, weight gain during pregnancy and birth outcomes.

Specific information to be disclosed:
Name; telephone number; date of birth, medical record number; date of first WIC visit: date of delivery; WIC visits notes; Pre-pregnancy, during pregnancy and end of the pregnancy weight and height records, gestational length, birth weight, height and related information of your newborn child and all the information from the following forms: Maternity Laboratory Report ; Initial Pregnancy Profile; Health History Summary; Prenatal Health History Summary; Domestic Violence Screening Report; Need List; Brief Smoking Cessation form; Maternity Self-history Sheet; Pregnancy Home Risk

Screening Information; screening tests results --Hepatitis, Rubella, HIV/AIDS, Neural tube, Hemoglobin.

I understand that this authorization will expire on the following date, event or condition:

End of the research study

I understand that if I fail to specify an expiration date or condition, this authorization is valid for the period of time needed to fulfill its purpose for up to one year, except for disclosures for financial transactions, wherein the authorization is valid indefinitely. I also understand that I may revoke this authorization at any time by signing the *Revocation Section* at the end of this form. I further understand that any action taken on this authorization prior to the rescinded date is legal and binding.

I understand that my information may not be protected from re-disclosure by the requester of the information; however, if this information is protected by the Federal Substance Abuse Confidentiality Regulations, the recipient may not re-disclose such information without my further written authorization unless otherwise provided for by state or federal law.

I understand that if my record contains information relating to HIV infection, AIDS or AIDS-related conditions, alcohol abuse, drug abuse, psychological or psychiatric conditions, or genetic testing this disclosure will include that information. I also understand that I may refuse to sign this authorization and that my refusal to sign will not affect my ability to obtain treatment, payment for services, or my eligibility for benefits; however, if a service is requested by a non-treatment provider (e.g., insurance company) for the sole purpose of creating health information (e.g., physical exam), service may be denied if authorization is not given. If treatment is research-related, treatment may be denied if authorization is not given.

I further understand that I may request a copy of this signed authorization.

_____	_____	_____
(Signature of Patient)	*(Date)*	*(Witness-If Required)*
_____	_____	_____
(Signature of Personal Representative)	*(Date)*	*(Personal Representative Relationship/Authority)*

****

NOTE: This Authorization was revoked on _____ _____

(Date) *(Signature of Staff)*

REVOCATION OF AUTHORIZATION

I do hereby request that authorization to disclose my health/medical information to _____ signed by me on _____ be rescinded, effective _____.

(Enter Date of Signature)

I understand that any action taken on this consent prior to the rescinded date is legal and binding.

_____	_____	_____	_____
(Signature of Patient)	*(Date)*	*(Signature of Witness)*	*(Date)*

_____	_____	_____
(Signature of Personal Representative)	*(Date)*	*(Personal Representative Relationship/Authority)*

SPANISH

GUILFORD COUNTY DEPARTAMENTO DE SALUD PÚBLICA
PLAN DE CUMPLIMIENTO: HIPAA AUTORIZACIÓN

AUTORIZACIÓN PARA DIVULGAR INFORMACIÓN SOBRE LA SALUD

Nombre del Paciente _____ Fecha de Birth_____

Paciente SS #__ _____ deje esta opción en blanco

Yo autorizo

_____
(Paciente o Representante Personal)

__ **La Guilford County Departamento de Salud Pública**
_____TO revelar información de salud específicos de los expedientes de los pacientes:

Nombre del destinatario: **Jigna M. Dharod**

Dirección de Destinatario: **Piedra 339 Bldg, GCNU, NC 27412**

Destinatario Teléfono/Fax: **336 334 9708**

Con el fin específico(s) como se indica a continuación:

Para llevar a cabo estudio titulado: la inseguridad alimentaria: ¿Cómo se relaciona con la casa medio ambiente, el embarazo y el parto los resultados entre las mujeres embarazadas WIC? La ONÜG Investigador Principal de este estudio es: Jigna M. Dharod, Profesor Asistente, y nutrición. El objetivo principal es entender la inseguridad alimentaria afecta al estado de salud, el aumento de peso durante el embarazo y el parto los resultados.

Información específica que debe conocer:
Nombre, número de teléfono, fecha de nacimiento, número de historia clínica, fecha de la primera WIC visita: fecha de entrega; WIC visitas notas; antes del embarazo, durante el embarazo y al final del embarazo peso y altura, longitud gestacional, peso al nacer, altura y de información relacionada con su hijo recién nacido y toda la información de la siguiente forma: Maternidad Informe de laboratorio ; perfil inicial del embarazo; Salud Historia Resumen: Resumen Historia Salud Prenatal; la violencia doméstica Informe de Evaluación; necesita la lista; Breve Cese del Tabaquismo; La Maternidad de la historia; el embarazo de riesgo Selección de información; pruebas de detección los resultados --la Hepatitis, rubéola, EL VIH/SIDA, tubo neural, la hemoglobina.

Entiendo que esta autorización caducará en la fecha siguiente, evento o condición:
Final del estudio de investigación

Entiendo que si no especifica una fecha de caducidad o de su estado, esta autorización es válida para el período de tiempo necesario para cumplir con su propósito por un período de hasta un año, a excepción de las revelaciones de las transacciones financieras, en el cual la autorización tendrá una validez indefinida. Yo también entiendo que puedo revocar esta autorización en cualquier momento mediante la firma la revocación *sección* al final de este formulario. Además, entiendo que cualquier acción tomada en esta autorización antes de la rescisión fecha es legal y vinculante.

Entiendo que mi información puede no estar protegidas de la divulgación por parte del solicitante de la información; sin embargo, si esta información está protegida por el Uso Indebido de Drogas Federal normas de confidencialidad, el destinatario no puede volver a revelar dicha información sin mi autorización por escrito a menos que se disponga otra cosa por ley federal o estatal.

Yo entiendo que si mi registro contiene información relativa a la infección por el VIH, el SIDA o enfermedades relacionadas con el SIDA, el abuso de alcohol, el uso indebido de drogas, psicológica o psiquiátrica, pruebas genéticas o esta información incluirá esa información. Yo también entiendo que se me puede negarse a firmar esta autorización y que mi negativa a firmar no afectará a mi capacidad para obtener el tratamiento, el pago por los servicios, o mi elegibilidad para recibir beneficios; sin embargo, si se solicita un servicio por un proveedor de tratamiento (p. ej., compañía de seguros) con el único propósito de crear información de la salud (p. ej., examen físico), el servicio podrá ser denegada si no autorización. Si el tratamiento no es relacionada con la investigación, el tratamiento podrá ser denegada si no se le da autorización.
Además, entiendo que puedo solicitar una copia de esta autorización firmada.

(Firma del paciente)	*(Fecha)*	*(Witness-If necesario)*
(Firma del Representante Personal)	*(Fecha)*	*(Representante Personal Relación y/o autoridad)*

* * * * * *

NOTA: Esta autorización fue revocada en

(Fecha)	*(Firma del personal)*

REVOCACIÓN DE LA AUTORIZACIÓN

Yo solicito que la autorización para revelar mi información sanitaria/médica de _____ firmado por mí en _____ ser rescindida, eficaz _____.
(Introduzca la fecha de la firma)

Entiendo que cualquier acción sobre este consentimiento previo para la rescisión fecha es legal y vinculante.

(Firma del paciente)	*(Fecha)*	*(Firma del testigo)*	*(Fecha)*

(Firma del Representante Personal)	*(Fecha)*	*(Representante Personal Relación y/o autoridad)*

APPENDIX D

RECRUITMENT FLYERS

FIP Study

Department of Nutrition
University of North Carolina-Greensboro

Are you…

- ☑ **4 to 6 months (13-27 weeks) pregnant?**
- ☑ **Currently a WIC participant?**
- ☑ **18 years or older?**

Yes to all means that you may be eligible to participate in a research study involving a two-part survey.

The purpose of the study is to understand your food habits and experiences related to food affordability during pregnancy.

The study will involve:

- **One approximate 60 minute in-person interview**
- **One approximate 20 minute telephone interview, in a 2-weeks period**
- **And, review of your pregnancy medical records.**

For your participation, you will get in total $ 40 in gift cards for a two part survey

$25 gift card for one in-person interview about your current lifestyle and eating habits
&
$15 gift card for a second phone interview follow-up on your eating habits

If you are interested or have any questions please call Danielle Nunnery at 336-613-6994 to set up an appointment

FIP Estudio

Depto. de Nutrición
Universidad de Carolina del Norte-Greensboro

Tiene usted...

- ☑ **¿De 4 a 6 meses (13-27 semanas) de embarazo?**
- ☑ **¿Esta actualmente participando en el programa de WIC?**
- ☑ **¿18 años de edad o más?**

Si contesto si a todas las preguntas anteriores, usted podría ser elegible para participar en un estudio de investigación que implica llenar dos cuestionarios..

El propósito de este estudio es comprender sus hábitos alimentarios y experiencias relacionadas con el acceso a comida durante su embarazo.

El estudio incluye:

- **Hacer una entrevista en persona/cara a cara que dura aproximadamente 60 minutos**
- **Hacer una entrevista telefónica de aproximadamente 20 minutos, luego de un periodo de 2 semanas.**
- **Dar autorización para que revisemos sus archivos médicos relacionados con su embarazo.**

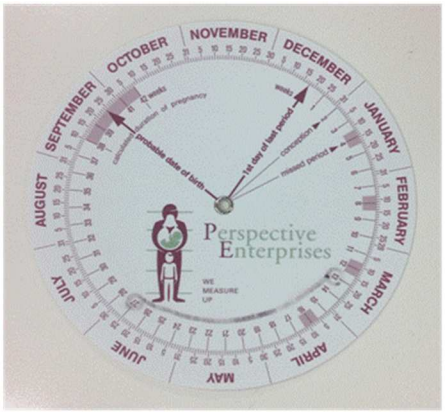
Por su participación en las dos encuestas, usted recibirá un total de $40 en tarjetas de regalo:

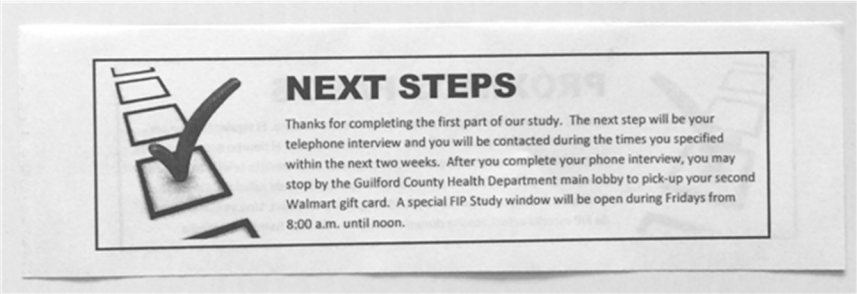
Una tarjeta de regalo de $25 por participar en la entrevista que se realizara en persona y será acerca de su estilo de vida y sus hábitos alimenticios
y
Una tarjeta de regalo de $15 por participar en la entrevista de seguimiento que se realizara por teléfono y será también acerca de sus hábitos alimenticios.

Si usted está interesada o tiene alguna pregunta, por favor llame al 336-334-9889. Favor de dejar un mensaje si es que contesta la

APPENDIX E

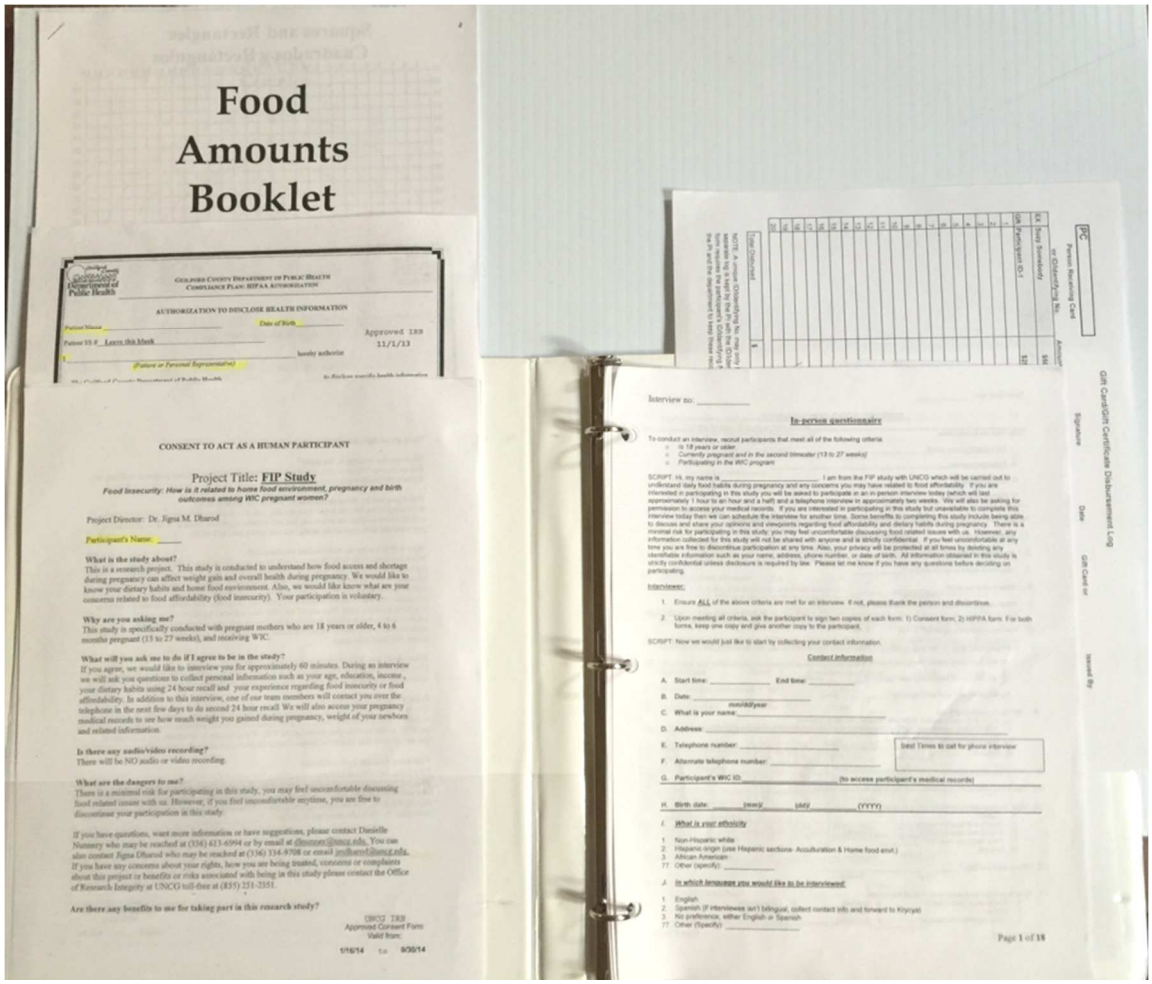
ADDITIONAL MATERIALS





NEXT STEPS

Thanks for completing the first part of our study. The next step will be your telephone interview and you will be contacted during the times you specified within the next two weeks. After you complete your phone interview, you may stop by the Guilford County Health Department main lobby to pick-up your second Walmart gift card. A special FIP Study window will be open during Fridays from 8:00 a.m. until noon.



Food Amounts Booklet

GUILFORD COUNTY DEPARTMENT OF PUBLIC HEALTH
COMPLIANCE PLAN: HIPAA AUTHORIZATION

AUTHORIZATION TO DISCLOSE HEALTH INFORMATION

Patient Name: _____ Date of Birth: _____

Patient SS # Leave this blank _____

I, _____ hereby authorize

(Patient or Personal Representative)

to disclose specific health information

Approved IRB
11/1/13

CONSENT TO ACT AS A HUMAN PARTICIPANT

Project Title: **FIP Study**

Food insecurity: How is it related to home food environment, pregnancy and birth outcomes among WIC pregnant women?

Project Director: Dr. Jigna M. Dharod

Participant's Name: _____

What is the study about?
This is a research project. This study is conducted to understand how food access and shortage during pregnancy can affect weight gain and overall health during pregnancy. We would like to know your dietary habits and home food environment. Also, we would like know what are your concerns related to food affordability (food insecurity). Your participation is voluntary.

Why are you asking me?
This study is specifically conducted with pregnant mothers who are 18 years or older, 4 to 6 months pregnant (13 to 27 weeks), and receiving WIC.

What will you ask me to do if I agree to be in the study?
If you agree, we would like to interview you for approximately 60 minutes. During an interview we will ask you questions to collect personal information such as your age, education, income , your dietary habits using 24 hour recall and your experience regarding food insecurity or food affordability. In addition to this interview, one of our team members will contact you over the telephone in the next few days to do second 24 hour recall. We will also access your pregnancy medical records to see how much weight you gained during pregnancy, weight of your newborn and related information.

Is there any audio/video recording?
There will be NO audio or video recording.

What are the dangers to me?
There is a minimal risk for participating in this study, you may feel uncomfortable discussing food related issue with us. However, if you feel uncomfortable anytime, you are free to discontinue your participation in this study.

If you have questions, want more information or have suggestions, please contact Danielle Nunnery who may be reached at (336) 613-6994 or by email at dnunnery@uncg.edu. You can also contact Jigna Dharod who may be reached at (336) 334-9708 or email jydharod@uncg.edu. If you have any concerns about your rights, how you are being treated, concerns or complaints about this project or benefits or risks associated with being in this study please contact the Office of Research Integrity at UNCG toll-free at (855) 251-2351.

Are there any benefits to me for taking part in this research study?

IRB# TRB
Approved Consent Form
Valid from:
1/16/14 to 9/30/14

Interview no: _____

In-person questionnaire

To conduct an interview, recruit participants that meet all of the following criteria:
- *is 18 years or older*
- *Currently pregnant and in the second trimester (13 to 27 weeks)*
- *Participating in the WIC program*

SCRIPT: Hi, my name is _____. I am from the FIP study with UNCG which will be carried out to understand daily food habits during pregnancy and any concerns you may have related to food affordability. If you are interested in participating in this study you will be asked to participate in an in-person interview today (which will last approximately 1 hour to an hour and a half) and a telephone interview in approximately two weeks. We will also be asking for permission to access your medical records. If you are interested in participating in this study but unavailable to complete this interview today then we can schedule the interview for another time. Some benefits to completing this study include being able to discuss and share your opinions and viewpoints regarding food affordability and dietary habits during pregnancy. There is a minimal risk for participating in this study, you may feel uncomfortable discussing food related issues with us. However, any information collected for this study will not be shared with anyone and is strictly confidential. If you feel uncomfortable at any time you are free to discontinue participation at any time. Also, your privacy will be protected at all times by deleting any identifiable information such as your name, address, phone number, or date of birth. All information obtained in this study is strictly confidential unless disclosure is required by law. Please let me know if you have any questions before deciding on participating.

Interviewer:

1. Ensure ALL of the above criteria are met for an interview. If not, please thank the person and discontinue.
2. Upon meeting all criteria, ask the participant to sign two copies of each form: 1) Consent form; 2) HIPPA form. For both forms, keep one copy and give another copy to the participant.

SCRIPT: Now we would just like to start by collecting your contact information.

Contact information

A. Start time: _____ End time: _____
B. Date: _____ mm/dd/year
C. What is your name: _____
D. Address: _____
E. Telephone number: _____
F. Alternate telephone number: _____
G. Participant's WIC ID: _____ (to access participant's medical records)
H. Birth date: _____ (mm) _____ (dd) _____ (YYYY)

Best Times to call for phone interview

I. What is your ethnicity

1. Non-Hispanic white
2. Hispanic origin (use Hispanic sections- Acculturation & Home food env.)
3. African American
77. Other (specify): _____

J. In which language you would like to be interviewed:

1. English
2. Spanish (If interviewee isn't bilingual, collect contact info and forward to Krycyal)
3. No preference, either English or Spanish
77. Other (Specify): _____

Page 1 of 18

Gift Card/Gift Certificate Disbursement Log

Participant ID #	Study Eligibility	Amount	Person Receiving Card or Citizenship No.	Signature	Date	Gift Card or	Issued By
101		$30	PC				
102		$30					
103		$30					
104		$30					
105		$30					
106		$30					
107		$30					
108		$30					
109		$30					
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199		$30					
200		$30					

Total Disbursed $ _____

NOTE: Up to $40 for PC with the Gift Card issued to participant's Citizenship # for the first and the dedicated Gift Card issued to the PC with the Participant's Citizenship #

FIP Study Checklist

- **Materials**
  - Consent forms (2 copies per participant- signs both)
  - Authorization to disclose health information form (2 copies per participant- signs both)
  - Questionnaire
  - Interviewer copy of food amounts booklet
  - Participant copy of food amounts booklet
  - Next steps card
  - Disbursement log sheets (participant must sign both)
  - Gift card
  - Measuring tools/models
  - Snacks/water

- **Procedures**
  - Once you arrive- check pink folders up front (in nutritionist boxes) to see if client is 18+, and if they are 13 -27 weeks preg.- take your wheel with you to do this.
  - If they fit criteria, place sticky note on outside of folder that says "FIP Study Eligible" to alert nutritionist.
  - **NOTE:** Check if the nutritionist or the peer counselor drops off participant- if it's a nutritionist make sure peer counselor gets a sticky note or you tell them you have their client. If it's the peer counselor, be sure to ask counselor who will have the client's vouchers and most importantly if client is **new maternity** you need to make sure they get to the group classroom for vouchers and that the team up front in the main check-in knows you have that client.
  - Explain that they are eligible and why (recruitment script) - make sure again they do fit criteria.
  - Offer water, and/or snack.
  - Explain 3 part process- 1 hour interview today, 1 follow-up phone interview in 2 weeks and access to medical records later after they give birth.
  - Explain and procure consent- Be sure to ask if they have any questions and remind them they can discontinue or decline to answer questions at any time.
  - Explain and procure authorization to disclose health info. and revocation procedure- to call us.
  - Begin interview using questionnaire.
  - Complete and THANK participant.
  - Give participant "next steps" card and describe the second phone interview process (including reminder on keeping food amounts booklet for phone interview) and how they pick up next gift card.
  - Disburse gift card for today's interview and be sure to give participant receipt.
  - Make sure you have written down card information on both disbursement sheets.
  - Be sure participant signs both disbursement sheets.
  - Repeat.