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Exploration of resources women use to seek food and nutrition information during pregnancy

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ABSTRACT

Nutrition is a common concern during pregnancy, yet women often do not meet the recommended nutrient intakes for a healthy pregnancy. Obtaining reliable food and nutrition information is challenging during pregnancy, and women do not know where to find credible information. **AIMS:** This study aims to investigate the food and nutrition information-seeking behaviors among low-income pregnant women experiencing their first pregnancy and compare these behaviors with pregnant women who are classified as middle and higher-income status. **METHODS:** A qualitative survey was developed to identify the type of information women seek, satisfaction with information, application of information to their diet choices, and barriers to seeking information. A total of 211 eligible pregnant women were recruited at a WIC clinic, a medical office, a university campus, and Facebook groups. **RESULTS:** Women primarily seek information on the internet during pregnancy, especially among the lower and higher-income groups. Women in the higher-income group were more likely to use a Registered Dietitian or nutritionist as a source. More women were being recommended by a family member or friend to see a Registered Dietitian during pregnancy rather than a healthcare provider. The most common barriers in seeking information were the abundance of contradictory information, lack of information tailored to specific needs, and unreliable sources. **CONCLUSION:** The internet is a frequently used source for information, yet many pregnant women are overwhelmed with contradictory and unreliable information that is not specific to their individual needs. There is an expressed need for improved access to reliable nutrition information during pregnancy and the inclusion of Registered Dietitians as a part of prenatal care.

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Sydni Hebert

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TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER 1: INTRODUCTION

Women often fail to meet nutrient intake recommendations for health nutrition and weight prior to pregnancy. The World Health Organization provides guidelines for prenatal care, however, there is a lack of comprehensive description of nutritional needs for women throughout pregnancy (Marshall et al., 2022). Nutritional needs vary depending on the individual, as nutrition recommendations for pregnant women do not consider the needs of women experiencing complicated pregnancies (Kominiarek et al., 2016). Early pregnancy is an essential time for following a high-quality diet to promote healthy fetus growth and prevent increased risks of developing pregnancy-related diseases such as hypertensive disorders of pregnancy, gestational diabetes mellitus, and preterm birth (Kibret et al., 2019). Additionally, adequate nutrition during pregnancy influences adulthood health conditions that can originate in fetal development. Health conditions including asthma, cardiovascular disease, obesity, hypertension, and diabetes originate in fetal life depending on the diet quality of the mother during pregnancy (Danielewicz et al., 2017).

Lack of food and nutrition knowledge is a major factor women have difficulty achieving nutrient needs during pregnancy. Women often have poor knowledge of food and nutrition information needed to have a healthy pregnancy (Lee et al., 2018). Pregnant women have various healthcare providers that can be involved in prenatal care, however, proper nutritional guidance can often fall short. Prenatal care visits often lack nutrition education and women feel their doctor provided very little information (Lee et al., 2018). Lack of pregnancy-related nutrition guidance leads women to seek nutrition information on their own. The use of the internet is a very common method pregnant women use to

search for nutrition information (Snyder et al., 2020). However, online sources often do not provide credible information.

Registered Dietitians and nutritionists provide the most credible nutrition guidance for pregnant women. Supplemental Nutrition Program for Women, Infants, and Children (WIC) services provide low-income pregnant women access to Registered Dietitians and nutritionists, and prenatal classes that provide nutrition guidance during pregnancy. Low-income pregnant women who are not enrolled in have very limited access to proper nutrition education and guidance. Therefore, they have to use accessible methods, such as the internet, for pregnancy-related food and nutrition information.

This chapter delves into the changing nutritional requirements for women during pregnancy. There are various physiological changes that occur during pregnancy that result in a change in dietary needs of the mother. These nutritional changes are crucial for optimal fetal development, fetal health, and the health of the fetus after birth. Adhering to a diet that achieves the recommended nutritional needs before and during pregnancy helps reduce risk of nutrition-related pregnancy complications such as pregnancy-induced hypertension, gestational diabetes mellitus, and preterm birth. A multitude of factors impact the ability for pregnant women to achieve nutritional requirements, such as food insecurity and lack of nutritional knowledge. The sources women use during pregnancy to seek food and nutrition information are explored; identifying the internet to be a frequently used source, as well as the use of family and friends being an additional source used by low-income pregnant women. Moreover, this chapter identifies motivating factors that lead pregnant women to seek information through certain sources. However, accessing trustworthy and individualized information is challenging, especially when

using certain sources that cannot guarantee reliability. This thesis aims to explore food and nutrition information resources and seeking behaviors during pregnancy, and compare these behaviors between pregnant women in three income groups.

1.1 PHYSIOLOGICAL CHANGES DURING PREGNANCY

During pregnancy, women will experience physiological changes that are normal and necessary for fetal development. Beginning as early as conception, these changes are seen in the cardiovascular, urinary, endocrine, gastrointestinal, hematological, respiratory, and skeletal systems (Beluska-Turkan et al., 2019). In the cardiovascular system, heart rate will increase up to 10 to 20 beats per minute, and cardiac output increases by roughly 20% by eight weeks gestation. Additionally, blood pressure decreases over the first and second trimesters, and increases in the third trimester (Beluska-Turkan et al., 2019).

In the urinary system, renal vasodilation and plasma flow increase significantly by 40% to 50% and 50% to 85%, respectively, ultimately increasing urinary output (Beluska-Turkan et al., 2019). Hormone levels of human chorionic gonadotropin (hCG), estrogen, and progesterone increase significantly, resulting in nausea and vomiting throughout pregnancy. In severe cases of nausea and vomiting, there is an increased risk of electrolyte imbalances, dehydration, micronutrient deficiencies, and weight loss, requiring nutrition interventions (Beluska-Turkan et al., 2019).

Throughout pregnancy, the uterus is continuously growing simultaneously with the growth of the fetus. In the gastrointestinal system, the stomach is pushed upwards due to uterine growth increasing gastric pressure and likely emerging other problems including heartburn and constipation (Beluska-Turkan et al., 2019). In the third trimester

of pregnancy, plasma volume increases up to 50% with hemoglobin, hematocrit, and red blood cell count decreasing. There is an increased need to receive adequate iron, folate, and vitamin B12 intakes to facilitate hemoglobin synthesis for the mother and the fetus (Beluska-Turkan et al., 2019).

In the respiratory system, the metabolic rate and oxygen consumption increase by 15% and 20%, respectively, resulting in a higher need for oxygen. Women may feel short of breath or experience hypoxia at any point throughout pregnancy, however, it is more common to occur during the third trimester (Beluska-Turkan et al., 2019). In the third trimester, bone reabsorption increases significantly compared to the first trimester due to the increased need for calcium to strengthen fetal bone health (Beluska-Turkan et al., 2019). To preserve the bone health and strength of the mother, adequate calcium intake must be met.

During a healthy pregnancy, these physiological changes should reverse after birth, however, pregnancy complications may affect the impact of these changes. Additionally, these changes result in differing nutritional needs. Not all women will experience all physiological changes described, therefore, nutritional needs must be adjusted to the individual. Along with these physiological changes in the mother, the components of fetal growth require nutritional intervention to ensure healthy development (Beluska-Turkan et al., 2019).

1.2 NUTRITION IN PREGNANCY

Pregnancy is the most vital time to meet nutritional needs for maternal and fetal health. A well-balanced diet of vegetables, fruit, legumes, whole grains, fish, and unsaturated fats can aid in providing a healthy pregnancy (Marshall et al., 2022). Even so,

nutrition before pregnancy is equally as important as nutrition during pregnancy, as it can influence the risk of nutrition-related complications (Marshall et al., 2022). Pre-pregnancy body weight affects gestation weight gain leading to increased probability of complications as well (Marshall et al., 2022). However, women often do not meet the recommended nutrient intake for healthy nutrition and weight before and during pregnancy. The World Health Organization (WHO) provides guidelines for prenatal care, however, there is a lack of comprehensive description of nutritional needs for women throughout pregnancy (Marshall et al., 2022). The nutritional needs of pregnant women differ from the needs of non-pregnant individuals. The nutritional recommendations for pregnant women also do not consider the needs of women experiencing complicated pregnancies. Therefore, adjustments are needed in recommendations to expand the inclusion of the greater population of pregnant women (Kominiarek et al., 2016).

To maintain a healthy pregnancy, it is recommended to begin healthy dietary habits and, if applicable, supplement support about two to three months before pregnancy until over four to six weeks postpartum (Marshall, et al., 2022). Throughout the pregnancy for optimal maternal and fetal metabolism, and fetal and placental growth, roughly 80,000 kcals are needed to support pregnancy from conception to birth. During the first trimester, caloric needs are found to be the same as non-pregnant women, and then the needs increase in the second and third trimesters (Kominiarek et al., 2016).

Along with increased needs for calories, some macro- and micronutrient recommended intakes remain the same or increase for pregnant women. Protein intake is recommended to be increased from the recommended intake of 0.8 g/kg/day to 1.1 g/kg/day (Kominiarek et al., 2016). Carbohydrates are increased and should make up 45-

64% of daily caloric intake, and fat intake remains the same recommended intake for non-pregnant women at 20-35% of daily caloric intake (Kominiarek et al., 2016). For the most part, micronutrient recommended needs of non-pregnant women remain the same for pregnant women. The micronutrients vitamin E, vitamin K, calcium, and phosphorus follow the recommended needs of non-pregnant women (Kominiarek et al., 2016). Whereas, nutrient recommended intake of vitamin A, vitamin D, folate, niacin, riboflavin, thiamin, vitamin B_6, vitamin B_{12}, vitamin C, iron, selenium, and zinc are increased in comparison to non-pregnant women (Kominiarek et al., 2016). The recommended micronutrient intake for pregnant women is determined by Recommended Dietary Allowance (RDA) data. The RDA of macro- and micronutrients are determined to be adequate needs for the average healthy individual by the Food and Nutrition Board of the Institute of Medicine (Kominiarek et al., 2016).

Supplemental Support

Predominantly following a well-balanced diet is sufficient to have a healthy pregnancy. However, supplemental support can be beneficial depending on individual needs. Dietary supplements can consist of a singular or multitude of dietary substances including but not limited to vitamins, minerals, and amino acids (Dickinson, 2011). In relation to pregnancy, women who experience complications and require additional nutrition support can benefit greatly from the incorporation of dietary supplements. Xiang et al. (2022) identified that pregnant women have very positive perceptions of supplemental support where 94% of pregnant women indicated using a supplement at least once within the last month of study participation. A significant number of pregnant

women had reported that they believe supplements could help prevent, improve, or treat nutrition-related diseases that can arise during pregnancy (Xiang et al., 2022).

Generally, healthcare providers involved in the pregnancy recommend pregnant women to consume a prenatal multivitamin and multimineral supplement in addition to following a balanced diet (Picciano & McGuire, 2009). Prenatal supplementation focuses on a multitude of nutrients, but often prioritizes iron, folic acid, calcium, vitamin D, docosahexaenoic acid (DHA), and iodine. Folic acid is a main nutrient found in nearly all prenatal supplements due to findings that show it prevents neural tube defects (American Academy of Pediatrics, 1999). Iron supplements have been proven beneficial, especially among pregnant women experiencing iron deficiency anemia (Picciano & McGuire, 2009). The World Health Organization (WHO) recommends all pregnant women supplement 120 mg of iron weekly throughout the duration of the pregnancy, with an adjusted increase for women experiencing anemia (World Health Organization, n.d.). If applicable, it is recommended to start taking prenatal supplements during the conception stage, as adequate nutrient intake during this time can lay the foundation for a healthy pregnancy (Picciano & McGuire, 2009).

1.3 CONSEQUENCES OF INADEQUATE NUTRITION INTAKE DURING PREGNANCY

Pregnancy Complications

Following a high-quality diet during pregnancy not only keeps the fetus healthy during term, but also reduces the mother's risk of developing pregnancy-related diseases. It is very common for pregnant women to develop adverse pregnancy and birth outcomes, such as hypertensive disorders of pregnancy, gestational diabetes mellitus, and preterm

birth when adequate nutritional needs are not met (Kibret et al., 2019). Therefore, dietary intake before and during pregnancy has an influential impact on the development of nutrition-related pregnancy complications.

Pregnancy-induced hypertension is when a woman develops high blood pressure during pregnancy and can be characterized as gestational hypertension, pre-eclampsia, eclampsia, and chronic hypertension (Sun & Niu, 2020). If left untreated, pregnancy-induced hypertension can cause limited or abnormal fetal development, premature birth, obesity and cardiovascular disorders for the fetus when reaching adulthood (Sun & Niu, 2020). Ikem et al. (2019) found that pregnant women who followed the Western diet were significantly more likely to develop gestational hypertension and pre-eclampsia. The Western diet is classified as a diet low in fruits and vegetables, large food portions, and high in fat, sodium, and sugar (Rakhra et al., 2020). Women who follow dietary recommendations and follow a balanced diet are less likely to develop hypertension during pregnancy (Jarman et al., 2018). A diet high in vegetables, pasta, fish, and legumes, such as the Mediterranean diet, has been proven to reduce risks of pregnancy-induced hypertension (Schoenaker et al., 2015). The decreased risk of developing pregnancy-induced hypertension is associated with the Mediterranean diet type and may be caused by nutrients such as magnesium, potassium, and calcium, all of which are known to decrease blood pressure (Schoenaker et al., 2015).

Additionally, pregnant women could be more at risk of developing gestational diabetes mellitus depending on the quality of their diet before and during pregnancy. Gestational diabetes mellitus is categorized as any type of glucose intolerance that occurs during pregnancy. Shin et al. (2015) found that there are three common dietary patterns

among their studied samples that are associated with higher risk of gestational diabetes mellitus with the strongest relationship to a higher risk of gestational diabetes mellitus being a diet of high added sugar and organ meats, and low fruit and vegetable intake. Each identified dietary pattern in this study was similar to the Western diet, such as high intakes of red meats, processed meats, refined grains, and high sugar content food items (Shin et al., 2015). Their findings also suggest that women who follow a diet with high intake of fruits and vegetables have a lower risk of gestational diabetes mellitus than women who do not adhere to the same diet (Shin et al., 2015). A high intake of added sugar can increase fasting blood glucose levels and insulin resistance, which can influence the development of gestational diabetes mellitus. High sugar intake in the form of sugar sweetened beverages even before pregnancy has been found to increase the risk of gestational mellitus diabetes in women (Chen et al., 2009).

Preterm birth is another term used to describe giving birth before 37 weeks gestation (Wang et al., 2021). Rasmussen et al. (2014) found that pregnant women who followed the Western diet had higher odds of induced preterm birth in comparison to other diets. Adherence to diets with increased intake of whole grains, fruits, vegetables, nuts and legumes, and low-fat dairy products have shown to decrease risk of preterm births (Gete et al., 2020). Newborns that are delivered earlier than 37 weeks gestation will also have low birth weights. K.C. et al. (2020) suggests that iron consumption has an influential impact on the likelihood of a low birthweight, where mother's consuming low levels of iron supplements throughout their pregnancy were three times more likely to have a low birth weight compared to women who took the recommended amount of iron. Additionally, this study identified gestation weight gain was associated with birth weight.

Pregnant women who had low gestational weight gain during the second and third trimesters were three times more likely to have a low birth weight than those who gained over 6.53 kg during the final two trimesters (K.C. et al., 2020).

Impacts on Infant Health

During the prenatal period, having a high-quality diet is crucial in fetal development and the long-term health of the mother and her unborn child. Achieving adequate micro- and macronutrient intake helps prevent nutrition-related pregnancy conditions, as well as influences adulthood conditions that originate in fetal development. Recent findings have shown that common diseases such as asthma, cardiovascular disease, obesity, hypertension, and diabetes originate in fetal life depending on the diet quality of the mother during that time period (Danielewicz et al., 2017). Inadequate prenatal nutrition is associated with early programming of future conditions that the fetus will have an increased risk of developing. By consuming adequate nutrients during the prenatal period, the fetus has a decreased chance of developing these health conditions in adulthood.

1.4 FACTORS INFLUENCING INADEQUATE NUTRITION INTAKE DURING PREGNANCY

Food Insecurity

Food insecurity has been a major problem in the United States for decades and the population experiencing food insecurity continues to grow. Individuals that are experiencing food insecurity have limited access to nutrient dense foods and enough food to reach adequate nutrition. Seligman et al., (2010) stated that there is an association between women experiencing food insecurity and having a higher BMI (Seligman et al.,

2010). Having a higher BMI during pregnancy can increase risks of preeclampsia, GDM, fetal abnormalities including congenital heart defects and neural tube defects, preterm delivery, and high birth weight for the baby (Prodan et al., 2023). Additionally, adults experiencing food insecurity have a 21% higher risk of hypertension and about 50% higher risk of diabetes (Seligman et al., 2010).

Nunnery et al. stated that 43% of low-income pregnant women are food insecure (Nunnery et al., 2018). In a food insecure household, non-perishables and energy-dense foods are prioritized due to their cheaper pricing when compared to nutrient dense foods such as fruits and vegetables. Low-income pregnant women experiencing food insecurity have limited access to fresh fruits and vegetables, but when possible will get canned fruits and vegetables (Nunnery et al., 2018).

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is a government-funded program that provides nutrition education, supplemental foods, and referrals for health care. WIC provides low-income pregnant women with services to help achieve adequate nutrition to promote a healthy pregnancy and fetal development. The program also helps low-income women who are low food secure and very low food secure. Pregnant women who are food insecure have a higher risk of diet-related disease during pregnancy due to limited access to nutrient dense foods and proper nutrition education. The voucher for fruits and vegetables has an association with reduced risk of preterm birth, however, the voucher would not provide enough to reduce food insecurity after birth (Wang et al., 2022).

Over the many years of operation, WIC has been effective in reducing preterm births, improving diet quality, and reducing risk of low birth weight (Blakeney et al.,

2020). Without the enrollment of WIC, low-income women have higher risk of diet-related disease during pregnancy, early birth, low birth weight, and fetal death. Blakeney et al., (2020) found that women who were not enrolled in WIC or entered the program later in their pregnancy had increased risk of their child being born with a low birth weight, whereas women who are enrolled or enrolled early in their pregnancy had a significantly less risk of low birth weight (Blakeney et al., 2020).

Lack of Nutrition Knowledge

Women often have difficulty consuming adequate amounts of necessary nutrients during pregnancy. Lee et al., (2018) had 105 pregnant women complete a questionnaire where no participants received a nutrition knowledge score higher than 80%. Based on the questionnaire results, pregnant women had poor knowledge of food sources of folate, energy, and nutrient requirements during pregnancy, recommended weight gain, and limiting fish sources with risk of mercury. Only ⅓ of the participating pregnant women had indicated receiving nutrition advice from healthcare professionals during their pregnancy (Lee et al., 2018). Unfortunately, pregnancy care visits are often short and don't allow enough time to provide detailed nutrition guidance. Pregnant women who do not have access to pregnancy-related nutrition education from proper clinicians have difficulty in adopting adequate nutrition behaviors necessary for a healthy pregnancy.

1.5 NUTRITION INFORMATION SEEKING BEHAVIOR

Sources of Information

Current research has found that women rely on a multitude of sources to seek food and nutrition information during pregnancy. When looking to receive food and nutrition-related pregnancy information women rely mostly on their healthcare provider,

the internet, and books (Lobo et al., 2020; Daigle et al., 2022; Olsen et al., 2020; Huberty et al., 2013; Lindsay, Le, et al., 2021; Mercado et al., 2017; Snyder et al., 2020; Downs et al., 2014; Kraschnewski et al., 2014; Narasimhulu et al., 2016; Ledoux et al., 2015; Cohen & Koski, 2013; Lindsay, Wallington, et al., 2017; Grenier et al, 2021). Throughout pregnancy, healthcare professionals are considered a reliable source on various nutrition-related topics including but not limited to diet, gestational weight gain, and supplements (Huberty et al., 2013; Song et al., 2013; Narasimhulu et al., 2016). Their healthcare provider is often their first source to receive information, but when the healthcare provider's advice and guidance fall short of their needs, women will resort to the internet for information (Lobo et al., 2020; Song et al., 2013; Narasimhulu et al., 2016; Ledoux et al., 2015; Daigle et al., 2022; Huberty et al., 2013; Mercado et al., 2017).

The internet is a popular source when women feel they need information quickly or add to the information received from their healthcare provider (Olsen et al., 2020; Snyder et al., 2020; Huberty et al. 2013). Since the internet is often readily available women will use the internet with some concern over credibility, but more so feeling that it is a good source for information (Song et al. 2013; Guendelman et al., 2017; Narasimhulu et al., 2016). Common search engines and websites for seeking information include Google, Yahoo, YouTube, Baby Center, and What to Expect When You're Expecting, and few women believe these sources provide credible information (Huberty et al., 2013; Snyder et al., 2020; Guendelman et al., 2017; Kraschnewski et al., 2014; Arcia et al., 2019). On the other hand, online government sources, such as womenshealth.gov and the CDC, are used by very few women, even though they find

these sources to be more trustworthy (Huberty et al., 2013). Social media is the least preferred source with many women feeling uncomfortable sharing personal information about their pregnancy and women felt that the information available on social media was unreliable (Arcia et al., 2019). However, other research has shown that some women use social media frequently to share their pregnancy experiences and learn from the experiences of others (Kraschnewski et al., 2014).

Registered Dietitians and nutritionists are very rarely used as a source for obtaining food and nutrition information (Misita et al., 2023; Cohen & Koski, 2013). Research shows that women are interested in meeting with a Registered Dietitian and nutritionists as part of their prenatal care, however, access to nutrition care services are limited depending on the individual (Misita et al., 2023). For example, if they are experiencing a "high-risk" pregnancy, they would be more likely to be referred to a Registered Dietitian or nutritionist (Misita et al., 2023).

Information Sought

A wide range of food and nutrition-related information is sought during pregnancy. Commonly, the information sought is to follow up from food and nutrition guidance during a healthcare provider visit or to ask their healthcare provider questions based on the found information (Huberty et al., 2013; Kraschnewski et al., 2014). Topics include iron, iodine, folate, healthy eating, recipes, food safety/foods to avoid, gestational weight gain, and physical activity (Lobo et al., 2020; Lindsay, Le, et al., 2021; Snyder et al., 2020). Current literature has expressed that first-time pregnant women are more likely to use the internet for information on folate, iodine, iron, and nausea compared to women who have experienced a previous pregnancy (Lobo et al., 2020).

Gestational weight gain is a common topic of information sought by pregnant women (Lindsay, Le, et al., 2021; Mercado et al., 2017; Misita et al., 2023; Cohen & Koski, 2013; Lindsay, Wallington, et al., 2017). The topic of gestational weight gain is a major concern as many women have little knowledge of their recommended gestational weight gain targets or follow incorrect advice (Mercado et al., 2017; Downs et al., 2014; Ledoux et al., 2015; Cohen & Koski, 2013; Lindsay, Wallington, et al., 2017). This knowledge gap is mostly due to pregnant women receiving little to no food and nutrition information from their healthcare providers (Mercado et al., 2017; Downs et al., 2014; Lindsay, Wallington, et al., 2017). Also, women who reported receiving information could not correctly identify their gestational weight gain recommendation based on pre-pregnancy BMI (Ledoux et al., 2015; Cohen & Koski, 2013).

Additionally, pregnant women that meet with a Registered Dietitian commonly ask for information regarding diabetes management, general healthy eating, food preparation, optimizing nutrient intake, gestational weight gain, and pregnancy-related symptom management (Misita et al., 2023). Even though most women have limited access to a Registered Dietitian for food and nutrition-related pregnancy information, women have indicated an interest in discussing topics such as meeting nutrition recommendations, physical activity, weight and weight change, healthy eating, postpartum weight loss, supplements, food aversions and what not to eat, and controlling type 2 diabetes during pregnancy (Misita et al., 2023).

Motivators for Seeking Behaviors

Sources of information used depend on the environment and support system the individual has throughout their pregnancy. Pregnant women are motivated to seek food

and nutrition information using the internet to answer their questions quickly. Additionally, they will cross-check the information found online using other sources to validate the reliability of the information received (Olsen et al., 2020; Huberty et al., 2013; Snyder et al., 2020; Legault & Marquis, 2014; Kraschnewski et al., 2014). Timing is an influential factor to information seeking behavior (Olsen et al., 2020; Snyder et al., 2020). Many women use the internet to receive information instead of asking their healthcare provider, due to difficulty getting in touch with their doctor or feeling that they are going to bother them with small questions (Narasimhulu et al., 2016).

Additionally, many women feel there is inadequate nutrition education provided during pregnancy and feel they must rely on themselves to fill the gap (Daigle et al., 2022; Mercado et al., 2017; Snyder et al., 2020; Downs et al., 2014; Narasimhulu et al., 2016; Lindsay, Wallington, et al., 2017; Grenier et al., 2021; Arcia et al., 2019). Often women relied on their judgment of the validity of the information sought because they found the guidance and advice from their healthcare provider to be too generalized and limited (Daigle et al., 2022; Downs et al., 2014; Kraschnewski et al., 2014; Ledoux et al., 2015; Grenier et al., 2021; Arcia et al., 2019). Some women also used the internet or other sources to obtain food and nutrition information before visiting their healthcare provider to ask questions and feel more confident in their knowledge during their visit (Huberty et al., 2013). Some women also sought the information they wanted to hear rather than information relevant to their needs (Daigle et al., 2022).

The obtained affective and external support influences the information seeking behaviors during pregnancy (Guillory et al., 2014). Network support from a committed partner, family, and friends positively influences online information seeking behaviors,

whereas assistance resource support reduces online information seeking behaviors among pregnant women (Guillory et al., 2014). Also, pressure from others influenced the information seeking behaviors and the implementation of information (Grenier et al., 2021). Some women express that the values and beliefs of family, friends, co-workers, and even strangers impacted their decision-making during pregnancy (Grenier et al., 2021). Examples include giving into food cravings following the societal idea of "eating for two" and comments on foods being consumed (Grenier et al., 2021).

1.6 NUTRITION INFORMATION SEEKING BEHAVIOR OF LOW-INCOME PREGNANT WOMEN

Sources Sought by Low-Income Pregnant Women

Healthcare providers and the internet are common sources for food and nutrition information among low-income pregnant women. There are limitations to internet access among low-income pregnant women, however, most literature shows accessibility to the internet among this population is commonly high (Arcia et al., 2019; Song et al., 2013; Guendelman et al., 2017). Research has shown that additional sources of information frequently sought by low-income pregnant women include family and friends, the father of the baby, prenatal classes, and community-based programs (Lindsay, Le, et al., 2021; Mercado et al., 2017; Song et al., 2013; Lindsay, Wallington, et al., 2017). First-time pregnant women will rely on their family and friends. Conflicting information or lack of information provided by healthcare providers and the internet lead women to asking pregnancy-related questions to family or friends that have children and have experienced pregnancy (Lindsay, Wallington, et al., 2017). Community-based programs, such as the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), are

often used for food and nutrition information during pregnancy where there is access to prenatal classes for information (Mercado et al., 2017; Grenier et al., 2021; Arcia et al., 2019; Downs et al., 2014). However, current literature does not uniformly express community-based programs and prenatal classes to be a common source for information reported from low-income pregnant women (Ledoux et al., 2015).

Information Sought by Low-Income Pregnant Women

Among low-income pregnant women, information varies based on topic and complexity (Arcia et al., 2019). Women in this population are also found to frequently search for information on nutritional needs during pregnancy, healthy eating, recipes, food safety/foods to avoid, gestational weight gain, and pregnancy-related symptom management. Additional information is related to general health-related pregnancy topics or information beyond maternal and child health (Song et al., 2013).

Motivators for Seeking Behavior Among Low-Income Pregnant Women

Financial status is a motivator to seek behaviors and implementation of information (Grenier et al., 2021). Some women identify the cost of healthy foods to be a barrier influencing the lack of sought information and lack of implementing behavior (Grenier et al., 2021). Additionally, language barriers have a major impact on seeking behaviors of food, and nutrition information during pregnancy. Low-income pregnant women who speak a language other than English experience difficulty with patient communication in the United States. Research has shown that women will seek sources other than their healthcare provider due to the discomfort of asking personal questions through an interpreter or miscommunication through translation (Lindsay, Wallington, et al., 2017). Culture influences information-seeking behaviors, especially among eating

habits, food beliefs, and religious beliefs (Legault & Marquis, 2014). Also, culture influences the source of information, commonly limited to family members and healthcare providers (Legault & Marquis, 2014).

Disparities in Seeking Information Among Low-Income Pregnant Women

Low-income pregnant women have limited access to resources for food and nutrition information during pregnancy. Key drivers of disparities among low-income pregnant women include low acculturation, influence of environmental factors (i.e. culture and interaction with others), access to technology, and low health literacy (Lindsay, Le, et al., 2021; Legault & Marquis, 2014; Song et al., 2013; Guendelman et al., 2017; Arcia et al., 2019). Women who are classified as having low acculturation are most likely to use the internet as a source for food and nutrition information during pregnancy (Lindsay, Le, et al., 2021). Also, culture impacts who and where women received information, and women are more likely to use their family members and healthcare providers as a source for information (Legault & Marquis, 2014). Low-income pregnant women are more likely to have limited access to the internet for information compared to pregnant women of middle-to-high-socioeconomic status. Socioeconomic factors influence information seeking behaviors and interpretation of information. Commonly, low-income pregnant women rely on interpersonal sources such as family members and friends who have experience with pregnancy, rather than other identified sources (Song et al., 2013). Health literacy is a common barrier for low-income pregnant women as information is often formatted with medical terminology that is difficult to follow and understand, leading to increased confusion (Arcia et al., 2019). Also, language barriers between the patient and healthcare providers limit the patient's ability to

comfortably ask questions and there is an increased risk of miscommunication when interpreters are not available (Lindsay, Wallington, et al., 2017).

Additionally, implementation is influenced by low socioeconomic status as there are financial barriers limiting access to credible sources and materials for healthy behaviors (Grenier et al., 2021; Arcia et al., 2019). Community-based programs, such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), are available to low-income pregnant women for prenatal class and pregnancy-related information. However, many women still rely on other sources for information and do not include program services as a source of food and nutrition information during pregnancy (Song et al., 2013; Kraschnewski et al., 2014; Ledoux et al., 2015; Arcia et al., 2019). Registered Dietitians and nutritionists are available in WIC clinics and can help provide credible information on food and nutrition during pregnancy. Yet, Registered Dietitians express the limited access women have to nutrition services with most nutrition education interventions being implemented late in pregnancy (Misita et al., 2023).

1.7 RELIABILITY AND PERSPECTIVES OF SOURCES ON FOOD AND NUTRITION INFORMATION

Unreliable Sources

Diet quality has a major influence on maternal and fetal health during the prenatal period. Pregnant women have various health care providers that can be involved in the process of pregnancy, however proper nutritional guidance can often fall short. Pregnant women are instructed on weight management during each stage of the prenatal period, but one study found that 1 out of every 10 women surveyed were giving correct guidance on weight gain during pregnancy (McDonald et al., 2011).

Lack of pregnancy-related nutrition guidance leads women to seek nutrition information on their own. The use of the internet is a very common method pregnant women use to search for nutrition information (Snyder et al., 2020). However, online sources are often unreliable. Snyder et al., (2020) suggest that pregnant women want better access to credible online information, as well as have their health care providers aid in finding pregnancy-related food and nutrition information (Snyder et al., 2020).

Registered Dietitians provide the most credible nutrition guidance for pregnant women. WIC services provide low-income pregnant women access to Registered Dietitians and nutritionists, as well as classes that provide nutrition guidance during pregnancy. Low-income pregnant women who are not enrolled have very limited access to proper nutrition education and guidance. Therefore, they have to use accessible methods, such as the internet, for pregnancy-related food and nutrition information that is often not credible.

Perceptions of Source Credibility

Being that the internet is a common source of food and nutrition information during pregnancy, there is a concern about the credibility of the information provided. Websites with pregnancy-related information run by the government and/or businesses provide accurate information (Lobo et al., 2020). However, most women use search engines and websites that output information not provided or reviewed by a healthcare professional. Blogs and social media posts are often identified to be inaccurate, yet some women will use these sources for food and nutrition information (Lobo et al., 2020). Inconsistent information found online leads to confusion and uncertainty among pregnant women (Snyder et al., 2020; Kraschnewski et al., 2014; Grenier et al., 2021). This occurs

especially among first-time pregnant women who do not have previous experience in determining correct information and how to implement the information into their daily lives.

To combat this barrier women will look through multiple sources and cross-check to determine the trustworthiness of the information they are seeking (Kraschnewski et al., 2014; Arcia et al., 2019). Women often felt it was difficult to trust the information they sought or that information was difficult to find or understand due to the use of medical jargon (Daigle et al., 2020; Huberty et al., 2013; Narasimhulu et al., 2016; Arcia et al., 2019). Search engines such as Google are often used to seek food and nutrition information during pregnancy, even though many women lack trust in the credibility of the information (Huberty et al., 2013). Other sources that are government-run and reviewed by healthcare professionals are identified by women to be more trustworthy, yet are not as often used for food and nutrition-related pregnancy information (Huberty et al., 2013). Additionally, books are a common source of information that is unhelpful. However, the book "What to Expect When Expecting" is a popular reference for pregnancy information, but is filled with unrelated information and provides outdated information (Kraschnewski et al., 2014).

Accuracy and Readability of Online Resources

The internet is an unregulated source of information that consists of conflicting and inaccurate information, even though the internet is a common source used to seek food and nutrition information during pregnancy. Storr et al., (2017) conducted a content analysis to identify the accuracy of online pregnancy-related nutrition information found through frequently used search engines including Google, Yahoo, and Bing. Findings

showed that 275 web pages consisted of accurate information A content analysis of the first three pages of the Google search engine identified that one-fifth of the sites failed to meet clinical or dietary guidelines (Lobo et al., 2020). On the other hand, pregnancy-related information online was analyzed and findings show that most information is accurate, but not uniformly accurate (Narasimhulu et al., 2016).

Insufficient Guidance From Healthcare Providers

A common theme among pregnant women is the feeling of minimal support from their healthcare provider. Most women use their healthcare provider as a source of food and nutrition information during pregnancy but feel the education they receive falls short of their needs. Firstly, pregnant women feel that the information they receive is general and focuses on an overall healthy diet, and not specific to their individual needs during pregnancy (Daigle et al., 2022; Arcia et al., 2019). Additionally, nutrition does not seem like a priority by their healthcare provider (Daigle et al., 2022; Lindsay, Wallington, et al., 2017). Many women express a lack of food and nutrition information during healthcare provider visits and feel unsupported by their doctor when wanting to focus on their nutrition during pregnancy. There is also a lack of pregnancy-related food and nutrition knowledge among healthcare providers, resulting in knowledge gaps among pregnant women (Huberty et al., 2013). Many women who receive some food and nutrition education still follow incorrect information, specifically recommendations on gestational weight gain throughout pregnancy (Downs et al., 2014; Ledoux et al., 2015; Cohen & Koski, 2013).

Some women report having great patient-provider communication when discussing food and nutrition information, whereas others received very little counseling

or were provided information through a pamphlet only (Mercado et al., 2017; Downs et al., 2014; Grenier et al., 2021). Limited guidance is also provided by healthcare providers, where some women know their healthcare provider tracks their weight each visit, but are not giving specific information on how much weight they have gained (Lindsay, Wallington, et al., 2017). Visit time is an identified barrier to receiving adequate food and nutrition information, often resulting in seeking information from other sources (i.e. internet, books, family/friends, etc.) (Narasimhulu et al., 2016; Lindsay, Wallington, et al., 2017; Arcia et al., 2019). Women feel the length of their visits inhibits their ability to gain food and nutrition information and would prefer more time to ask questions. The scheduling of care visits also influences the quality of pregnancy-related nutrition education. Women express that most healthcare provider visits occur later in pregnancy and nutrition guidance is perceived to be most important in the earlier stages of pregnancy (Mistita et al., 2023; Kraschnewski et al., 2014). Registered Dietitians and nutritionists are often referred to pregnant women late in the pregnancy, and are then required to provide reactive care rather than proactive care (Misita et al., 2023).

Conflicting Information Causing Confusion

Pregnancy is usually associated with diet awareness and changes in eating patterns, however, sources for information can bring confusion reducing the ability to achieve healthier diet quality (Bianchi et al., 2016). There are numerous outlets for pregnancy-related information between books, family/friends, healthcare providers, social media, internet sources, etc. These sources can provide conflicting information, making it difficult to cross-check and follow proper guidance. Research by Bianchi et al.,

(2016) states that some of the participants had difficulty obtaining information due to inconsistencies between the information they received from healthcare professionals and family members; an example given by a participant was the concept of eating for two, where the doctor directed them to eat as normal, but their family said to eat more since she is eating for two (Bianchi et al., 2016). These inconsistencies make pregnant women feel lost in how they should change their eating habits to attain adequate nutrition.

1.8 IMPLEMENTATION OF INFORMATION IN NUTRITION BEHAVIORS

Implementation of information is based on individual needs and values (Olsen et al., 2020). After seeking information from preferred sources, women significantly increased their behavior and focused on a better diet during pregnancy (Huberty et al., 2013). Women are more likely to adopt healthy behaviors after receiving pregnancy-related food and nutrition information. After obtaining food and nutrition information during pregnancy, women experience increased confidence in their ability to implement a change in behavior for the betterment of their health and fetal health (Huberty et al., 2013).

Consuming more fruits and vegetables, increased physical activity, and decreased sugar-sweetened beverage consumption were adopted by pregnant women after seeking information through online sources (Huberty et al., 2013). Additionally, increased knowledge of gestational weight gain from sources resulted in increased consciousness of eating behaviors and increased activity (Kraschnewski et al., 2014). Physical activity was implemented into daily life when women were provided information and guidance on proper exercise to follow throughout pregnancy (Lindsay, Wallington, et al., 2017). When information on physical activity was perceived as inadequate, women did not

exercise due to fear of hurting the baby (Lindsay, Wallington, et al., 2017). Women who receive insufficient information from their healthcare provider are less likely to have concerns about implementing healthy eating behaviors throughout pregnancy (Lindsay, Wallington, et al., 2017).

1.9 STUDY OVERVIEW AND AIMS

Women who are experiencing their first pregnancy are often confused from feeling excited yet scared of the unknowns that occur during pregnancy. The prenatal period comes not only with immense joy and love for the life growing in a mother's belly but also with physical and emotional challenges. One of the most common concerns during pregnancy is consuming adequate amounts of necessary nutrients needed to keep the mother and her unborn baby healthy. However, many pregnant women do not have access to reliable food and nutrition information. Currently, research is limited among resources lower-income pregnant women use to seek food and nutrition information. This study aims to investigate the food and nutrition information-seeking behaviors among lower-income pregnant women experiencing their first pregnancy and compare these behaviors with those of pregnant women who belong to the middle and higher socioeconomic status categories. Examples include the type of information they seek, satisfaction with information, application of information to their diet choices, and barriers to seeking information. Using a survey instrument we intend to examine the information-seeking behaviors of pregnant women among the three socioeconomic categories: lower-income, middle-income, and higher-income. This study will bring more insight to the accessibility of food and nutrition education among lower-income pregnant women, and

understand additional services or methods women use for food and nutrition information and guidance during their pregnancy.

CHAPTER 2: MATERIALS AND METHODS

2.1 STUDY DESIGN

This mixed-design, cross-sectional study involves a qualitative online survey with both closed and open-ended questions to explore the sources of information women use to seek food and nutrition information during pregnancy, and their experience in the search process. This approach provided a deeper understanding of specific sources utilized and the information-seeking behaviors of pregnant women among three income groups, including barriers faced in obtaining information and how women applied the information to their daily lives. This study has received ethical approval from Montclair State University Institutional Review Board before the start of the study. Consent was obtained electronically through a Prospective Agreement Form provided at the start of the survey. Once participants clicked “Agree”, they consented to participate in the study.

2.2 RECRUITMENT

Study participants were recruited from the North Hudson WIC clinic, Lifeline Medical Associates, an OB-GYN office located in Northern New Jersey, and Facebook groups specific to mothers and pregnant women. Open Montclair State University listservs were used to send an email plea, however, it is unknown how many had sent the email plea to subscribed students and alumni. An email invitation was distributed by Montclair State University’s Nutrition and Food Studies Department to undergraduate students, graduate students, and alumni enrolled in the Nutrition and Food Science program. Also, flyers were posted in classrooms and hallway bulletin boards throughout the University Hall building located on Montclair State University campus. Active

recruitment was conducted by posting flyers in the lobby of the North Hudson WIC clinic which provided brief information of the study as well as the survey link in the form of a QR code. The North Hudson WIC clinic also sent the study information through their text message system and posted the survey information and link on their Facebook page. At the OB-GYN office, flyers were distributed to patients and posted in the lobby. Study information and survey links were posted in Facebook groups designated for new mothers and pregnant women. Recruitment materials invited women to share their experiences on the resources they used to seek nutrition information during pregnancy. All recruitment materials were developed in English and Spanish. Participants who completed the survey were entered into a raffle and had the chance to receive a $20.00 Amazon gift card. A link to receive this compensation was sent using the email address provided following survey submissions.

2.3 SAMPLE POPULATION

A total of 234 pregnant women participated in the survey. However, 23 participant responses were removed from the study due to various eligibility restrictions. One participant's survey response was removed due to answering the question about their age and leaving all the following questions unanswered. Another participant's survey response was removed due to providing answers unrelated to pregnancy and food and nutrition information-seeking experiences. Two participant survey responses were removed from the study due to being duplicated from another survey response where all question answers, including demographic data, were the same. A total of 19 participants indicated “prefer not to answer” on the total household annual income question and were removed from the analysis since the study addresses food and nutrition information-

seeking behaviors with income status. Additionally, 2 participants who reported never looking for information were not included in the results of the questions that followed the fourth question in the second section of the survey. The participant population consisted of pregnant women who are currently pregnant with their first child. Requirements to participate included that women should be pregnant with their first child, read Spanish and/or English, and be at least 18 years of age.

To create homogeneity, participants were separated into three groups according to income status (lower-income, middle-income, and higher-income) based on their reported total household annual income. Of the 211 participants included in the final analysis, 98 indicated a total household annual income of less than $49,999, 82 indicated a total household annual income between $50,000 and $79,999, and 31 indicated a total household annual income of $80,000 or more. Participants who indicated less than $49,999 total household annual income were characterized as the lower-income group. This total household annual income status was characterized as lower income based on the New Jersey WIC income guidelines indicating eligibility for services at $45,991 for a family size of three and is equal to or less than the income poverty guidelines increased by 185% (State of New Jersey Department of Health, 2023). Assumptions of family household size were made based on the eligibility criteria that participants must be experiencing their first pregnancy and assume their partner is part of the household. The middle-income group included participants who indicated a total household annual income between $50,000 to $79,999. This classification was determined based on the United States' most recent census data of national median household income from 2022, which was estimated as $74,580 (United States Census Bureau, 2022). The following

total annual household income choices with participants indicating a total annual household income of $80,000 or higher were identified as high-middle to high-income and were categorized as the higher-income group.

2.4 INSTRUMENT DEVELOPMENT

Two surveys were developed, one in English and one in Spanish. The questions were developed in English and then translated into Spanish using Google Translate. A native Spanish speaker in the Nutrition and Food Studies Department then reviewed the translated survey to ensure correctness. All responses provided through the survey were anonymous as no identifying information was collected within the survey. However, following the survey, a link was provided for participants to enter their email addresses in a separate survey for compensation. The survey asked questions to investigate demographics (i.e. age, race/ethnicity, marital status, current stage of pregnancy, and annual household income), the seeking behaviors for sources of information women rely on during their pregnancy, what stage in their pregnancy did they search for such information, if they have ever been recommended to see a dietitian, and their experience seeking and applying pregnancy-related food and nutrition information. Participants could choose to skip questions that they did not want to answer or stop the survey at any time, and the information provided up to that point was excluded from the dataset.

Survey questions were based on the Snyder et al., (2020) survey questionnaire used to determine sources used to seek nutrition information and gestational age when starting the search. In total the survey asked 15 to 20 questions depending on the responses provided throughout the survey. All questions, except age, could be skipped by participants if they did not wish to answer them. Demographic data was collected within

the first five questions of the survey. Participants were first asked to provide their current age as of January 1st, 2023, their race and ethnicity, marital status, current stage of pregnancy, and range that best describes their total annual household income.

The following six questions were tailored to investigate the pregnancy-related food and nutrition sources sought by participants. The first question asked for participants to select all listed topics that were discussed with their healthcare provider during prenatal visits; multiple choices could be selected. Topic choices include "how much weight I should gain during pregnancy", taking prenatal vitamins or folic acid supplements, choosing fish and seafood low in mercury, the need for increased iodine in the diet during pregnancy, limiting added sugar consumption in my diet, monitoring caffeine intake during pregnancy, and none of the above. The second question asked "What sources do you use when looking for pregnancy-related food and nutrition information?" in which participants could select all that applied. Sources participants could select included the internet, books, Primary Care Doctor, OB-GYN, nutritionists, Registered Dietitian, family, friends, none/I never looked, and Other where participants could write in sources. The third question was only shown for participants who reported a source used for information. If a participant reported "None, I never looked" they would skip this question and move on to the fourth question. Since the terms nutritionist and registered dietitian are often used interchangeably, to avoid self-reporting errors in data analysis nutritionist and Registered Dietitian were combined to be one source. Select choices from the second question would be shown in the third question asking "Which sources used to seek pregnancy-related food and nutrition information was most helpful to you?". The fourth question asked "During what stage of your pregnancy did you start

searching for pregnancy-related food and nutrition information?", in which participants can select before pregnancy or the range of gestational age in weeks concerning the first, second, and third trimesters. The fifth question asked "During your pregnancy, have you ever been recommended to meet with a Registered Dietitian for food and nutrition information?", in which participants report yes or no. Those who report yes will be prompted with the sixth question: "Who recommended you to meet with a Registered Dietitian" where they can choose between family, friend, Primary Care Doctor, OB-GYN, or Other in which they can write in. Those who report no to the fifth question will not be prompted to the sixth question and will move on to open-ended questions.

The next section of questions were nine open-ended questions to investigate the specific sources used to seek information, satisfaction with information received, what information they sought, experience application of information to daily life, possible challenges faced during seeking experience, and ideas for improvement in seeking experience. The first question of this section asked participants to write in the specific sources they used when seeking pregnancy-related food and nutrition information. The second question asked if participants were happy with the information they found and could report yes or no. Those who indicate yes skip the next question and move on to the fourth question, but those who indicate no will be prompted to the next question. Question three asked why they were not happy with the information they found and participants could write in to explain. The fourth question asked "What information were you looking to find?" in which participants could select multiple choices regarding topics they sought including prenatal vitamins or folic acid supplements, adequate weight gain throughout pregnancy, foods to limit or avoid during pregnancy, gestational diabetes, or

other nutrition-related pregnancy complications. The fifth question asked “With the information you found, did you apply it to your daily life?” in which participants can indicate yes or no. Those who indicated yes were prompted to the next question, whereas those who indicated no skipped to question seven. Question six asked participants to indicate how easy it was to apply on a 5-point Likert scale ranging from extremely easy to extremely difficult. The seventh question asked “When looking for information, what challenges do you encounter in receiving proper food and nutrition information?” which participants could write in their response. Question eight asked participants to indicate on a 5-point Likert scale from extremely easy to extremely difficult “How was your experience searching for pregnancy-related food and nutrition information?”. If extremely easy was reported the following question would be skipped, ending the survey. The last question asked participants to write about the change they would like to see to improve their seeking experience.

2.5 DATA COLLECTION

The open-ended survey was administered using the online software Qualtrics. Data collection was conducted over two months between January 2024 and March 2024. Recruitment at the OB-GYN clinic started on January 29th, however, recruitment at North Hudson WIC, Montclair State University listservs, flyer distribution on Montclair State University campus, and Facebook groups began in late February 2024. These methods of recruitment were introduced after the start of data collection due to low participant recruitment. Survey data collected via the Spanish survey was translated using Google Translate and incorporated with data collected from the English survey. Survey data and email addresses were collected. Through a separate survey participants were

asked to submit their email addresses if they wished to participate in the raffle. A total of 10 participants were randomly selected to receive the compensation prize.

2.6 STATISTICAL ANALYSIS

All demographic data other than age and sources of information, are presented as categorical variables, and total annual household income was presented based on income status group (lower-income, middle-income, and higher-income). ANOVA analysis was conducted to determine the mean age among the three groups. A chi-square test was used to determine if income status had any influence on nutrition information-seeking behaviors. Post hoc testing was conducted following chi-square and ANOVA analysis. Descriptive statistics was used to determine the sources of nutrition information used most often and resources found to be the most beneficial in their search for information. A conceptual content analysis was conducted to determine common themes among the open-ended question responses collected through the survey including barriers in searching experience and ideas for improvement.

Results are shown in percentages and frequencies, or mean and standard deviation (SD) for age. Blank and skipped answers are included in the analysis and classified as "no answer" to include all active participant data. Statistical significance was fixed at $p < .05$, except for significant values of post hoc tests following chi-square analysis; which were determined using Bonferroni adjustment. The system used for analyses was IBM SPSS Version 29.0.2.0 (20) Statistical Software (SPSS Inc., Chicago, IL, USA).

CHAPTER 3: RESULTS

3.1 DEMOGRAPHIC CHARACTERISTICS

Demographic data are shown in **Table 1.** The participants in this study ranged between 20 and 41 years old. The lower-income, middle-income, and higher-income groups had very similar age means. The middle-income group had the lowest age mean and the higher-income group had the highest age mean. The lower-income group had an age mean of 30 ± 3.5 years old, the middle-income group had a mean of 29.5 ± 3.9 years old, and the higher-income group had an age mean of 31.3 ± 4.7 (p = .077). A post hoc analysis was conducted and found that the lower-income group was not significantly different from the middle-income (p = .604) or the higher-income group (p = .233). Similarly, there was no significant difference between the middle-income group to the lower-income group (p = 0.604) or the higher-income group (p = .061). No significant difference was found between the higher-income group to the lower-income group (p = .233) or the middle-income group (p = .061).

Of the sample population, participants identified their ethnicity as either Hispanic, Latino(a/x), black or African-American, Native Hawaiian or Alaskan Native, white, Native Hawaiian or other Pacific Islander, or Southeast Asian. The lower-income group was predominantly white (72.4%) with 24 participants identifying as Hispanic, Latino (a/x), or Spanish (24.5%), one participant identifying as black or African-American (1%), and two participants identifying as Southeast Asian (2%). The middle-income group consisted of predominantly white self-identified participants (92.7%), 5 participants identified as Hispanic, Latino(a/x), or Spanish (6.1%), and one participant identified as black or African-American (1.2%). The higher-income group also consisted mostly of

white self-identified participants (61.3%), with 3 participants identified as Hispanic, Latino(a/x), or Spanish (9.7%), 6 participants identified as black or African-American (19.4%), and one participant identified as American Indian or Alaskan Native (3.2%). A significant difference was found between the income groups and race/ethnicity ($p < .001$). After conducting post hoc analysis, the likelihood of being Hispanic, Latino (a/x), or Spanish was higher among the lower-income group ($X^2 = 12.25$, 1 df, $p < .003$) compared to the middle-income group. The likelihood of identifying as black or African-American is higher among the higher-income group ($X^2 = 24.01$, 1 df, $p < .003$) compared to the lower and middle-income groups. The likelihood of identifying as Native Hawaiian or other Pacific Islander is higher among the higher-income group ($X^2 = 11.56$, 1 df, $p < .003$) compared to the lower-income group. The likelihood of identifying as white is higher among the middle-income group ($X^2 = 16$, 1 df, $p < .003$) compared to the lower and higher-income groups.

The majority of participants in this study reported that their marital status was married (86.7%). In the lower-income group, 79 participants indicated that they are married (80.6%), 15 participants indicated that they are single or never married (15.3%), and 3 indicated they are separated (3.1%). In the middle-income group, 77 participants reported being married (93.9) and 4 reported being single or never married (4.9%). In the higher-income group, 27 participants reported being married (87.1%), 3 reported being single or never married (9.7%), and one reported being separated (3.2%) two participants did not report their marital status.

The current stage of pregnancy was divided into the gestational weeks that define the first (0-12 weeks), second (13-27 weeks), and third (28-40 weeks) trimesters. In the

lower-income group, 42 participants reported being in the first trimester (42.9%), 33 reported being in the second trimester (33.7%), and 22 reported being in the third trimester (22.4%). In the middle-income group, 37 participants reported being in the first trimester (45.1%), 40 reported being in the second trimester (48.8%), and 4 reported being in the third trimester (4.9%). In the higher-income group, 8 participants reported being in the first trimester (25.8%), 16 reported being in the second trimester (51.6%), and 6 reported being in the third trimester (19.4%). One participant from each group (n= 3) did not report their current stage of pregnancy. There was a significant difference between income status and the current stage of pregnancy ($p = .016$). After conducting post hoc analysis, the likelihood of being 28-40 weeks pregnant is lower among the middle-income group ($X^2 = 10.89$, 1 df, $p < .004$) compared to the lower and higher-income groups.

Table 1. Demographic Characteristics of Sample Population (n = 211)

	Lower-Income[a] (n= 98)	Middle-Income[b] (n= 82)	Higher-Income[c] (n= 31)	*p*-value[d]
Age, mean (SD), Years	30.0 (3.5)	29.5 (3.9)	31.3 (4.7)	.077
Race/Ethnicity, n (%)				< .001
Hispanic, Latino(a/x), or Spanish	24 (24.5)	5 (6.1)	3 (9.7)	
Black or African-American	1 (1.0)	1 (1.2)	6 (19.4)	
American Indian or Alaska Native	0 (0)	0 (0)	1 (3.2)	
White	71 (72.4)	76 (92.7)	19 (61.3)	
East Asian	0 (0)	0 (0)	0 (0)	
Middle Eastern	0 (0)	0 (0)	0 (0)	
Native Hawaiian or Other	0 (0)	0 (0)	2 (6.5)	

Pacific Islander				
South Asian	0 (0)	0 (0)	0 (0)	
Southeast Asian	2 (2.0)	0 (0)	0 (0)	
Multiracial or Multi-ethnic	0 (0)	0 (0)	0 (0)	
Race/Ethnicity not listed	0 (0)	0 (0)	0 (0)	
Unknown/Prefer not to answer	0 (0)	0 (0)	0 (0)	
Marital Status, n (%)				.204
Single, never married	15 (15.3)	4 (4.9)	3 (9.7)	
Married	79 (80.6)	77 (93.9)	27 (87.1)	
Divorced	0 (0)	0 (0)	0 (0)	
Separated	3 (3.1)	0 (0)	1 (3.2)	
Widowed	0 (0)	0 (0)	0 (0)	
No Answer	1 (1.0)	1 (.2)	0 (0)	
Current Stage of Pregnancy, n (%)				.016
1-12 weeks	42 (42.9)	37 (45.1)	8 (25.8)	
13-27 weeks	33 (33.7)	40 (48.8)	16 (51.6)	
28-40 weeks	22 (22.4)	4 (4.9)	6 (19.4)	
No Answer	1 (1.0)	1 (1.2)	1 (3.2)	

[a] *Lower-income participants include participants who indicated an annual income of less than $49,999.*

[b] *Middle-income participants included participants who indicated an annual income between $50,000 and $79,999.*

[c] *Higher-income participants included participants who indicated an annual income of $80,000 or more.*

[d] *Significance determined when $p < .05$.*

3.2 FOOD AND NUTRITION TOPICS DISCUSSED IN PRENATAL HEALTH VISITS

To evaluate the education participants received from their healthcare providers during pregnancy, participants were asked to select all common food and nutrition-related pregnancy topics that were discussed during their prenatal health visits. Six topics were addressed including gestational weight gain, prenatal supplements, limiting food sources such as fish high in mercury, need for increased iodine intake, limiting added sugar, and monitoring caffeine intake. Results suggest that participants are being provided food and nutrition-related information during their prenatal health visits (**Figure 1**).

A significant difference was found between income status and discussion on how much weight they should gain during pregnancy during their prenatal health visits (p = .014). After conducting post hoc analysis, the likelihood of discussing weight gain during a prenatal visit was lower among the lower-income group (X^2 = 7.29, 1 df, p < .008) compared to the middle-income group. Approximately less than half (48%) of the participants in the lower-income group did discuss weight gain during pregnancy with their healthcare provider, in comparison the majority (69.5%) of participants in the middle-income group discussed this topic with their healthcare provider. In the higher-income group, approximately over half of the participants (58.1%) discussed the topic during their prenatal visits.

The topic of prenatal vitamins or folic acid supplements had no significant difference between the three groups (p = .068). More participants in the higher-income group (87.1%) reported having discussed this topic with their healthcare provider than participants in the lower-income (65.3%) and middle-income (69.5%) groups.

There was a significant difference between the income groups and the discussion of fish consumption during prenatal visits ($p = .022$). After conducting post hoc analysis, the likelihood of discussing fish consumption during a prenatal health visit was lower among the lower-income group ($X^2 = 7.29$, 1 df, $p < .008$) compared to the middle group. In the lower-income group, 46 participants reported discussing this topic with their healthcare provider (46.9%), whereas 19 participants in the middle-income group reported discussing the topic (61.3%). In the higher-income group over half of participants reported discussing the topic (67.1%).

There was no significant difference between income status and discussing increasing iodine during prenatal health visits ($p = .456$). Approximately half of the participants in the lower-income (48%) and higher-income (51.6%) groups discussed the topic during their prenatal visits. However, in the middle-income group, approximately more than half of the participants (57.3%) had discussed this topic during their prenatal visits. Notably, the lower-income, middle-income, and higher-income groups were approximately divided into half and half of the participants who discussed the topic compared to those who did not.

No significant difference was found between income status and discussion of limiting added sugar consumption during prenatal health visits ($p = .635$). Respectively, 45.9% of participants in the lower-income group, 52.4% of participants in the middle-income group, and 45.2% of participants in the higher-income group reported discussing added sugar consumption during their prenatal health visits.

A significant difference was found between income status and the discussion of monitoring caffeine intake during prenatal health visits ($p = .049$). After conducting post

hoc analysis, the likelihood of discussing monitoring caffeine intake during a prenatal health visit is higher among the middle-income group ($X^2 = 2.89$, 1 df, $p < .008$) compared to the higher-income group. Approximately half the participants in the lower-income group (46.9%) reported discussing monitoring caffeine intake during a prenatal visit. A little more than half of the participants in the middle-income group reported discussing this topic (54.9%). Whereas, only 29% of participants in the higher-income group discussed monitoring caffeine intake during their prenatal health visits. A total of 5 (5.3%) participants reported not having discussed any of the topics listed. Out of the 5 participants, 4 were in the lower-income group and 1 in the middle-income group. No significant difference was found between income status and not discussing any of the addressed topics during their prenatal health visits ($p = .292$).

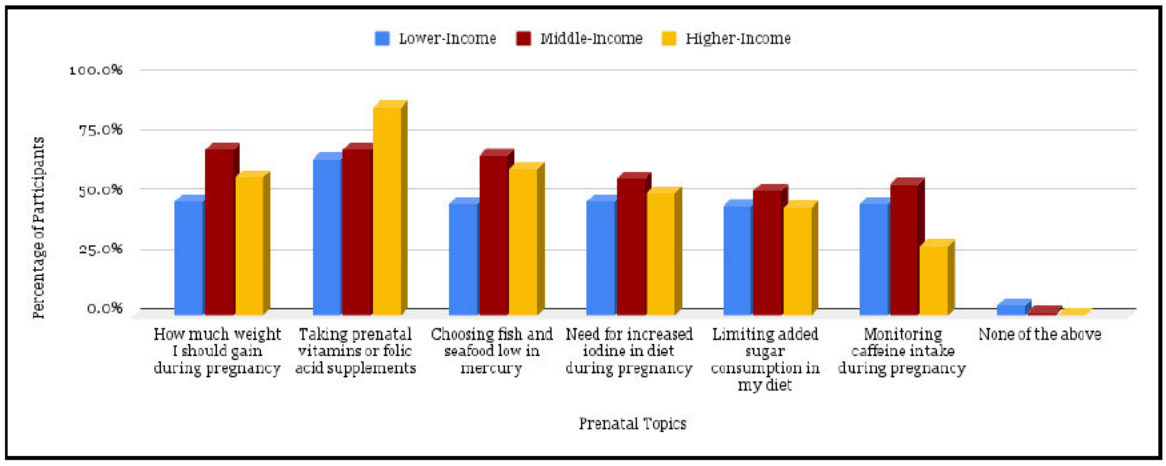

Figure 1. Food and Nutrition Topics Discussed During Prenatal Health Visits

"During any of your prenatal visits, did a healthcare provider talk to you about any of the following? Select all that apply:"

**Participants were able to select more than one choice.*

3.3 STAGE OF PREGNANCY WHEN SEEKING INFORMATION BEGAN

There was no significant difference between income status and stage of pregnancy when searching for food and nutrition information started (p = .800). Most participants in all three groups reported starting to seek pregnancy-related food and nutrition information during 1-12 weeks gestation (50.7%), respectively (**Figure 2**). Of the participants who reported starting their search at 1-12 weeks, 50% were in the lower-income group, 53.7% were in the middle-income group, and 45.2% were in the higher-income group. Approximately 38.9% of participants reported starting their search for information before pregnancy, respectively, with 39.8% in the lower-income group, 37.8% in the middle-income group, and 38.7% in the higher-income group. Only 8.1% of participants started seeking information at 13-27 weeks of gestation. The lowest number of participants reported seeking information in 28-40 weeks with only 3 participants (1.4%), respectively.

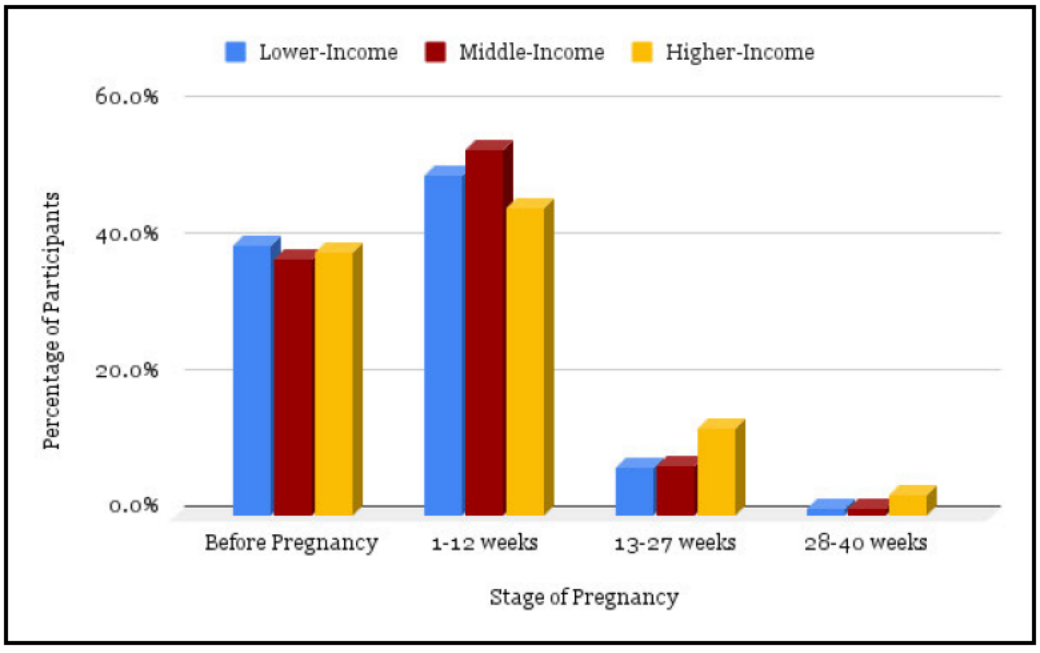

Figure 2. Stage of Pregnancy When Seeking Information Began

**Participants who reported seeking information during the second or third trimester were based on participants who had reached the gestation week range indicated.*

3.4 SOURCES USED TO SEEK INFORMATION

For all three groups, the internet and Primary Care Doctor were reported to be the most frequently used sources for food and nutrition information during pregnancy (**Figure 3)**. No significant difference was found between income groups and using the internet ($p = .07$), books ($p = .269$), Primary Care Doctor ($p = .130$), and family ($p = .062$) as a source for food and nutrition information. However, there was a significant difference between income groups and the use of an OB-GYN ($p < .001$), Registered Dietitian or nutritionist ($p < .001$), and friends ($p = .002$) as a source for information. After conducting post hoc analysis, the likelihood of using an OB-GYN as a source for information was lower among the lower-income group ($X^2 = 17.64$, 1 df, $p < .008$) compared to the middle-income group and higher-income group. The likelihood of using a Registered Dietitian or nutritionist as a source for information was lower among the lower-income group ($X^2 = 16$, 1 df, $p < .008$) and higher among the higher-income group ($X^2 = 16.81$, 1 df, $p < .008$) compared to the middle-income group. The likelihood of using a friend as a source for information was lower among the higher-income group ($X^2 = 10.24$, 1 df, $p < .008$) compared to the lower and middle-income groups. Only two participants reported never looking for pregnancy-related food and nutrition information, all of whom were in the lower-income group.

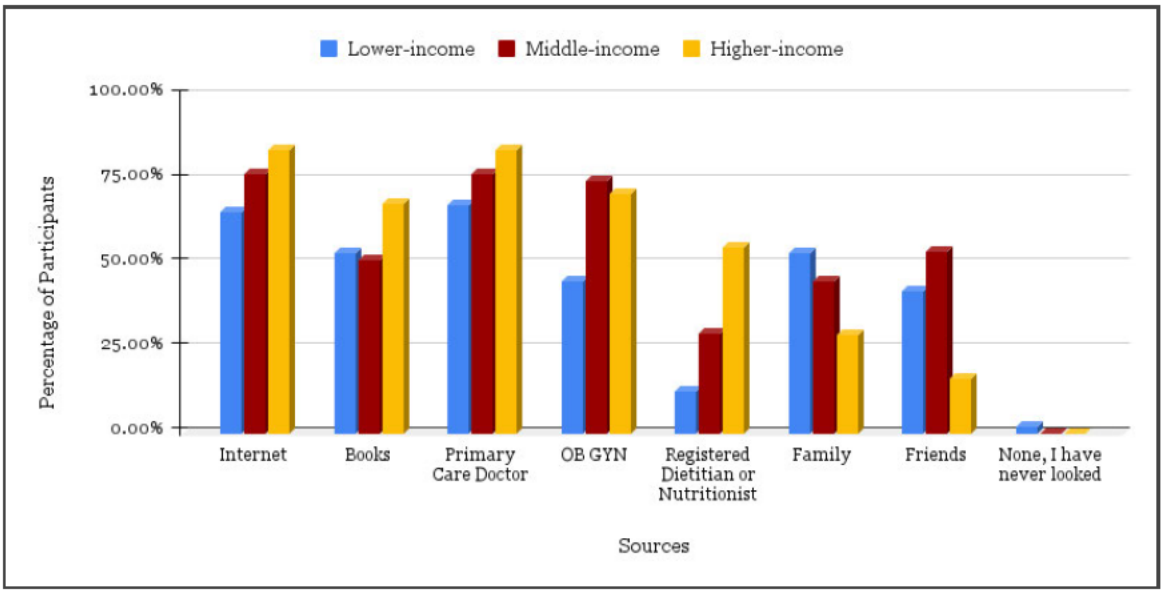

Figure 3. Sources Used to Seek Food and Nutrition Information

"What sources do you use when looking for pregnancy-related food and nutrition information? Select all that apply."

**Participants were able to select more than one choice.*

Despite a Primary Care Doctor being one of the most frequently used sources, participants also reported the internet and their OB-GYN to be the most helpful source for food and nutrition information (**Figure 3**). A significant difference was found between income status and sources reported to be most helpful ($p < .001$). After conducting post hoc analysis, the likelihood of a Primary Care Doctor being identified as the most helpful source for information was higher among the higher-income group ($X^2 = 10.24$, 1 df, $p < .002$) compared to the lower-income group. The likelihood of identifying friends as the most helpful source was higher among the lower-income group ($X^2 = 9$, 1 df, $p < .002$) compared to the higher-income group. Participants in the lower-income group reported the internet as the most helpful source, respectively. Whereas, participants

in the middle-income group reported their OB-GYN as the most helpful source. The two participants who reported never looking for pregnancy-related food and nutrition information can be seen in **Figure 4**. A total of 41 participants did not answer the question on which source was found the most helpful, 27 of which were in the lower-income group, and 14 in the middle-income group.

Many participants reported using specific sources such as pregnancy guidebooks, AmericanPregnancy.org, the Mayo Clinic website, pregnancy apps like The Bump, BabyCenter, and What to Expect, the WebMD website, online blogs, and pregnancy support groups. Google was reported as a common search engine used to find pregnancy-related food and nutrition information.

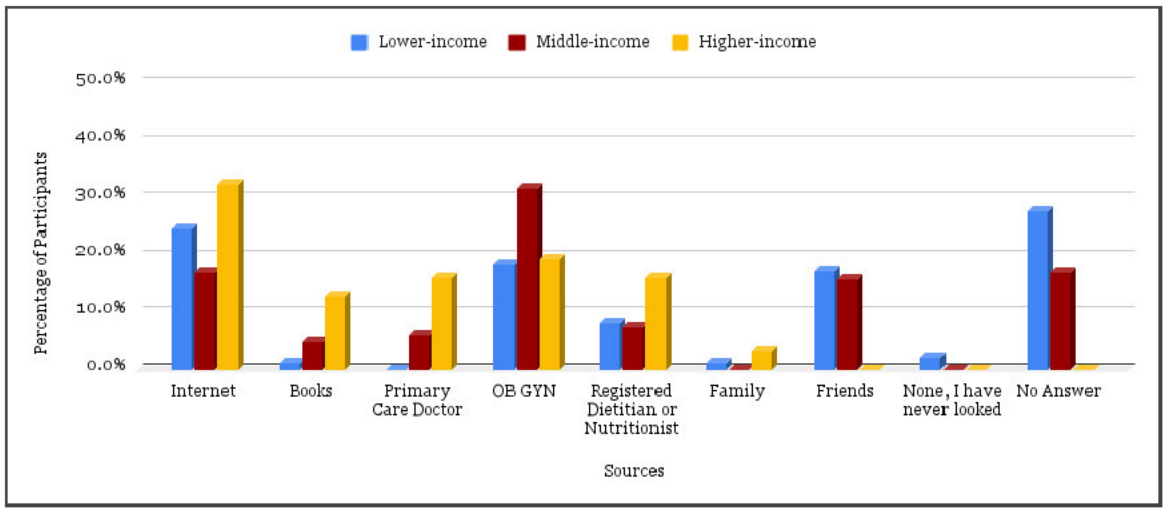

Figure 4. Sources Found Most Helpful When Seeking Information

"Which source used to seek pregnancy-related food and nutrition information was most helpful to you?"

**Participants were able to select only one choice based on their selected choices from the previous question: "What sources do you use when looking for pregnancy-related food and nutrition information?"*

3.5 INFORMATION SOUGHT

The information topics sought during pregnancy are seen in **Figure 5**. All three income groups searched for food and nutrition information regarding foods to limit or avoid during pregnancy (81.3%). Additionally, participants in the higher-income group showed comparable interest in searching for prenatal vitamins or folic acid supplements (77.4%) compared to information on foods to limit or avoid during pregnancy (77.4%). However, information on prenatal vitamins or folic acid supplements was searched the least among participants in the lower-income group (8.3%) and the middle-income group (39%). In the higher-income group, the least searched for topic of information was gestational diabetes or other nutrition-related pregnancy complications (16.1%). Information on adequate weight gain was the third most frequently searched topic among the lower-income (66.7%) and higher-income groups (71%). Two participants reported looking for other topics of information, with one participant reported looking for "general guidelines and recommendations based on the stage of pregnancy". The other participant reported that her family does not "eat a lot of meat, but aren't fully vegetarian" and searched for information to make sure she is achieving the proper "balanced nutrition". No significant difference was found between income groups and information sought including adequate weight gain throughout pregnancy ($p = .412$) and food to limit or avoid ($p = .876$). However, significant differences were found between income groups and information on prenatal vitamins or folic acid supplements ($p < .001$), gestational

diabetes or other nutrition-related pregnancy complications ($p < .001$), and other ($p = .003$). After conducting post hoc analysis, the likelihood of searching for information on prenatal vitamins or folic acid supplements was lower among the lower-income group ($X^2 = 42.25$, 1 df, $p < .008$) and higher among the higher-income group ($X^2 = 38.44$, 1 df, $p < .008$) compared to the middle-income. The likelihood of searching for information on gestational diabetes or other nutrition-related pregnancy complications was higher among the lower-income group ($X^2 = 8.41$, 1 df, $p < .008$) compared to the higher-income group. The likelihood of searching for other information was higher among the higher-income group ($X^2 = 11.56$, 1 df, $p < .008$) compared to the lower-income group.

The majority of participants reported being happy with the information they received (97.6%). Notably, all participants in the middle-income group indicated that they were happy with the information they found. Two participants reported not being happy with the information they found, one being in the lower-income group and one in the higher-income group. One participant did not answer the question. One participant reported not being happy with the information they found and reported that “everything is contradictory and confusing”. No significant difference was found between income groups and satisfaction with information sought ($p = .198$).

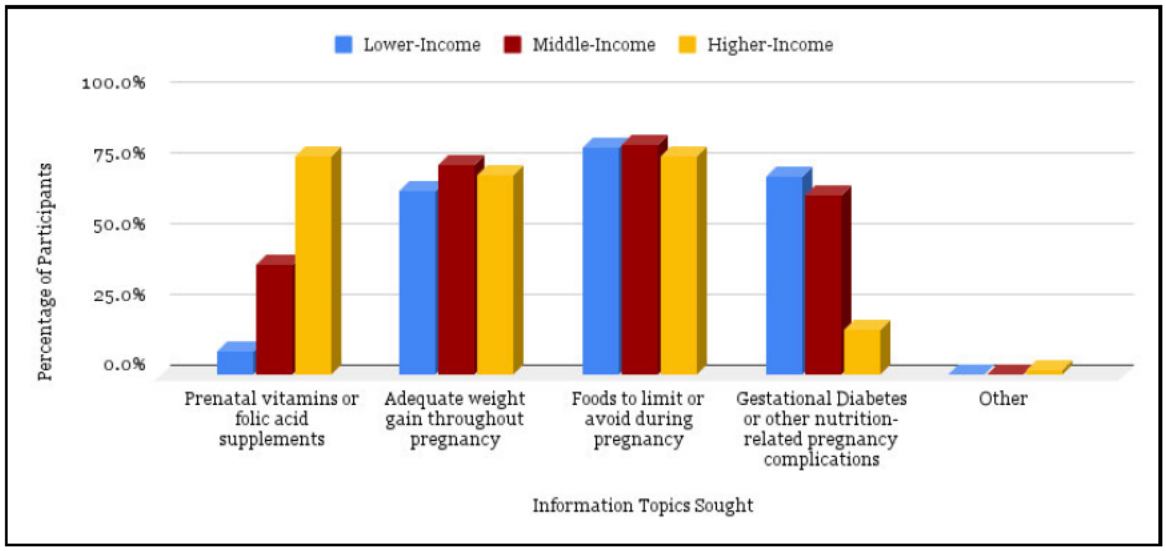

Figure 5. Food and Nutrition Information Sought

"What information were you looking to find?"

**Participants were able to select more than one choice.*

3.6 RECOMMENDATIONS TO SEE A REGISTERED DIETITIAN

Approximately 82.5% of participants reported being recommended to see a Registered Dietitian for pregnancy-related food and nutrition information. A majority (91.5%) of participants in the middle-income group reported being recommended to see a Registered Dietitian, whereas 79.6% in the lower-income group, and 67.7% of participants in the higher-income group reported being recommended. A significant difference was found between the three income groups and being recommended to see a Registered Dietitian during pregnancy ($p = .007$). After conducting post hoc analysis, the likelihood of being recommended to see a Registered Dietitian was higher among the middle-income group ($X^2 = 7.29$, 1 df, $p < .008$) compared to the higher-income groups.

The majority of participants reported a family member (45.5%) or friend (43.1%) as the one to recommend them to see a Registered Dietitian during pregnancy as seen in **Figure 6**. In the lower-income group, of those who were recommended to see a Registered Dietitian 48.7% reported the recommendation coming from a family member and 44.9% reported receiving a recommendation from a friend, respectively. However, only 2.6% reported being recommended to see a Registered Dietitian by a Primary Care Doctor, and 3.8% reported receiving a recommendation from an OB-GYN, respectively. Similarly, the majority of middle-income participants reported being recommended by a family member (44%) or by a friend (44%), whereas only 8% reported being recommended by a Primary Care Doctor and 4% reported being recommended by an OB-GYN, respectively. In the higher-income group, 38.1% of participants reported being recommended by a family member, and 33.3% reported being recommended by a friend, respectively. Additionally, approximately 19% of participants in the higher-income group were recommended to see a Registered Dietitian and 9.5% were recommended by an OB-GYN. No significant difference was found between recommendation source and income group ($p = .173$). Results suggest that women are more likely to be recommended to see a Registered Dietitian during pregnancy by family and friends than by a healthcare provider.

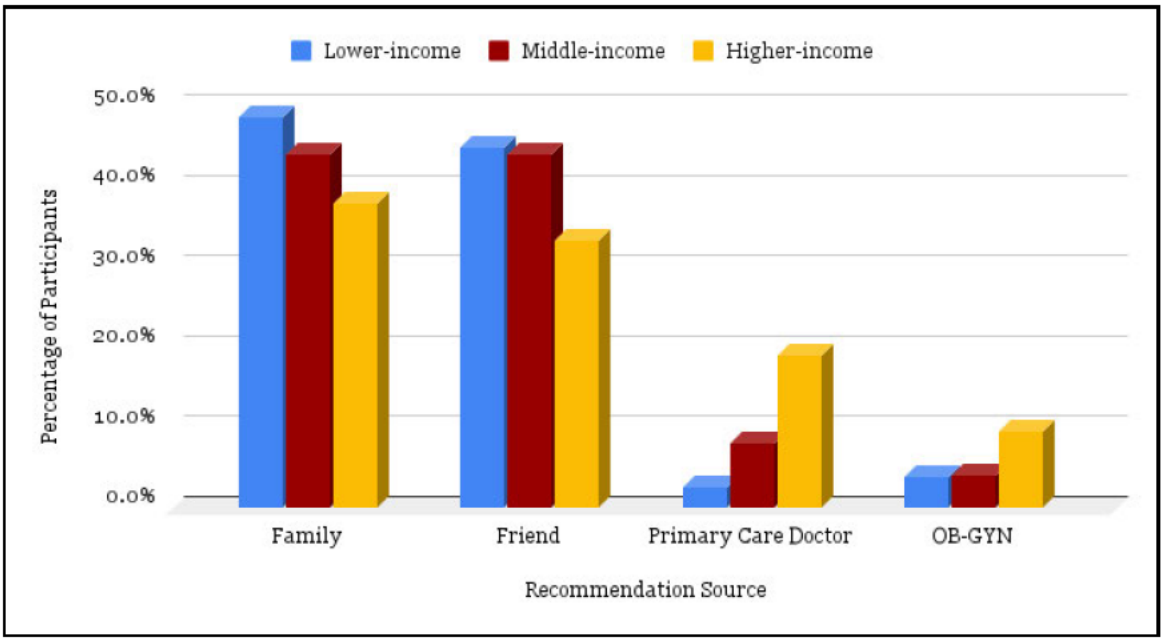

Figure 6. Sources of Recommendations to See Registered Dietitian

**Percentage shows participants that reported being recommended to see a Registered Dietitian during pregnancy (n = 174).*

3.7 APPLYING INFORMATION TO DAILY LIFE

All participants reported applying the information they sought into their daily life. However, no significant difference was found between the income groups and the application of information (p = .312). Results suggest that participants find applying the food and nutrition information they received into their daily lives to be easy or not easy or difficult. Using a 5-point Likert scale, participants were asked to indicate how difficult it was to apply the information to their daily lives from extremely easy to extremely difficult (**Figure 7**). In the higher-income group, most participants reported the application to be extremely easy (45.2%). Of the participants who reported that applying the information they found to their daily lives was somewhat easy, 27.6% were in the

lower-income group, 26.8% were in the middle-income group, and 29% were in the higher-income group. In the lower-income (36.7%) and middle-income groups (43.9%), most participants reported application to be neither easy nor difficult. Only six participants (2.8%) reported applying information to be somewhat difficult. No participants reported applying the information to be extremely difficult.

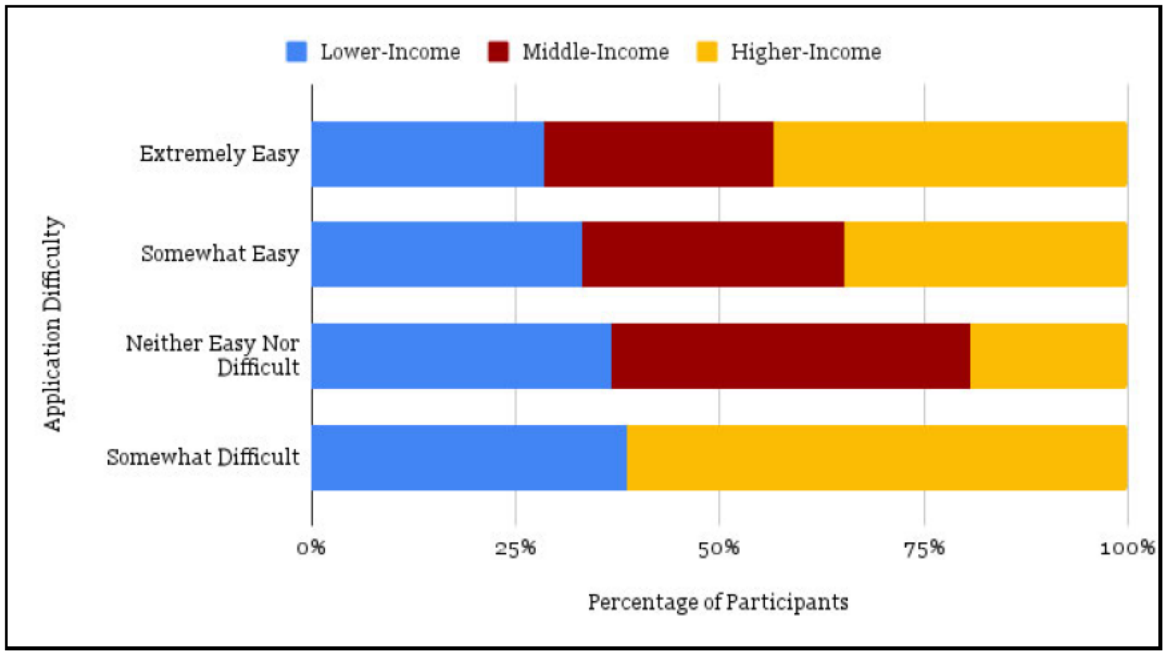

Figure 7. Difficulty Applying Information Sought Into Daily Life

**Participants were able to select only one choice.*

***This question was only shown to participants who indicated "yes" to applying the information they sought into their daily lives.*

3.8 EXPERIENCE SEEKING FOOD AND NUTRITION INFORMATION

Using a 5-point Likert scale, participants were asked to indicate their difficulty level when searching for pregnancy-related food and nutrition information from extremely easy to extremely difficult (**Figure 8**). There was a significant difference

between income groups and searching experience difficulty ($p < .001$). After conducting post hoc analysis, the likelihood of having an extremely easy searching experience was higher among the higher-income group ($X^2 = 11.56$, 1 df, $p < .003$) compared to the lower and middle-income groups. Also, the likelihood of having a somewhat difficult searching experience was higher among the higher-income group ($X^2 = 23.04$, 1 df, $p < .003$) compared to the lower and middle-income groups. Results suggest that participants found their experience seeking information was, for the most part, easy. In the higher-income group, the majority of participants reported their experience to be extremely easy (32.2%). The majority of participants in the lower-income (52%) and middle-income (45.1%) groups reported their searching experience to be somewhat easy. Of the participants who reported their experience to be neither easy nor difficult, 34.7% were in the lower-income group, 43.9% in the middle-income group, and 22.6% in the higher-income group. Only 6 participants reported their experience to be somewhat difficult (2.8%), of which one was in the lower-income group and 5 were in the higher-income group. One participant did not answer the question.

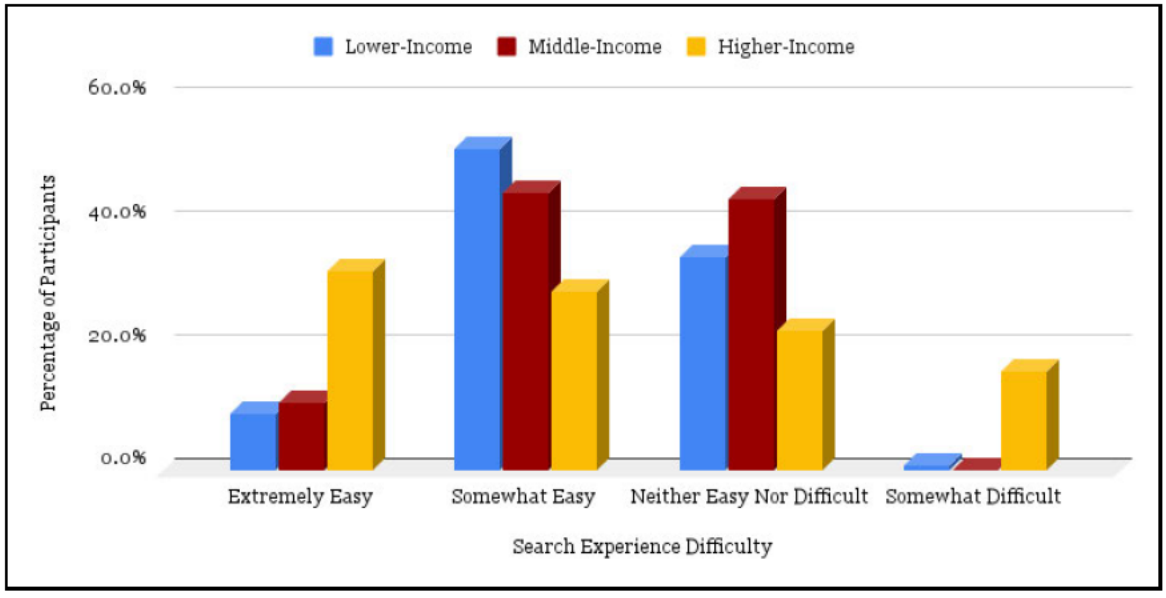

Figure 8. Difficulty Searching For Food and Nutrition Information

**Participants were able to select only one choice.*

***Graph only includes participants that responded to the question and indicated searching for food and nutrition information during pregnancy.*

Three common themes were identified using content analysis regarding barriers participants experienced when searching for pregnancy-related food and nutrition information. The common themes included conflicting information, information was too generalized, and unreliable sources (**Figure 9**). Participants who reported difficulty obtaining information that was specific to their individual needs were included in the information was too generalized theme. No significant difference was found between income groups and common themes ($p = .411$).

When looking for information approximately 20.8% of participants in the lower-income group, 7.7% in the middle-income group, and 33.3% in the higher-income group reported that there is a lot of conflicting information hindering their ability to find proper food and nutrition information: Some reported statement from participants include:

"Diverse opinions and/or responses." (*Lower-Income*)

"There is so much [information] on the internet and different opinions." (*Higher-Income*)

"Different websites, books, and experts may offer different dietary advice, which can be confusing for pregnant women." (*Middle-Income*)

"Contradictory advice from different healthcare professionals and sources." (*Middle-Income*)

Majority of participants in the lower-income (50%) and middle-income groups (61.5%) reported that finding information that is specific to their needs is one of the biggest challenges they face. Whereas, only 16.7% of participants in the higher-income group reported generalized information to be a barrier, respectively. Some reported statements from participants include:

"Personalized nutrition plans or advice." (*Lower-Income*)

"Inadequate resources for women with special dietary needs, such as vegetarians or those with food allergies." (*Lower-Income*)

"Challenges in balancing nutritional needs with personal food preferences or cultural dietary restrictions." (*Lower-Income*)

"Dealing with health issues like anemia and finding appropriate dietary solutions." (*Middle-Income*)

"Everyone's physical conditions and needs are different, so generic advice may not work for everyone." (*Middle-Income*)

Additionally, there is an overwhelming amount of information available through various sources, making it difficult to determine what is accurate and reliable. The majority of participants in the higher-income group (50%) reported source reliability as a barrier, whereas 29.2% of participants in the lower-income group and 30.8% of participants in the middle-income group reported this barrier, respectively. Some reported statements from participants include:

"Some [information] is extreme. You never know what to believe." (*Higher-Income*)

"There is a great deal of information on the internet, but not all of it is accurate and reliable. I spend a lot of time sifting through and validating information." (*Middle-Income*)

"There is a wealth of information available online about diet and nutrition during pregnancy, but some of it may not be accurate or applicable to individual circumstances." (*Lower-Income*)

"Not all websites and books are reliable sources of information, and pregnant women need to choose carefully." (*Lower-Income*)

"Overwhelming amount of information online, making it hard to discern credible sources." (*Lower-Income*)

"Misinformation spread through social media and online communities." (*Lower-Income*)

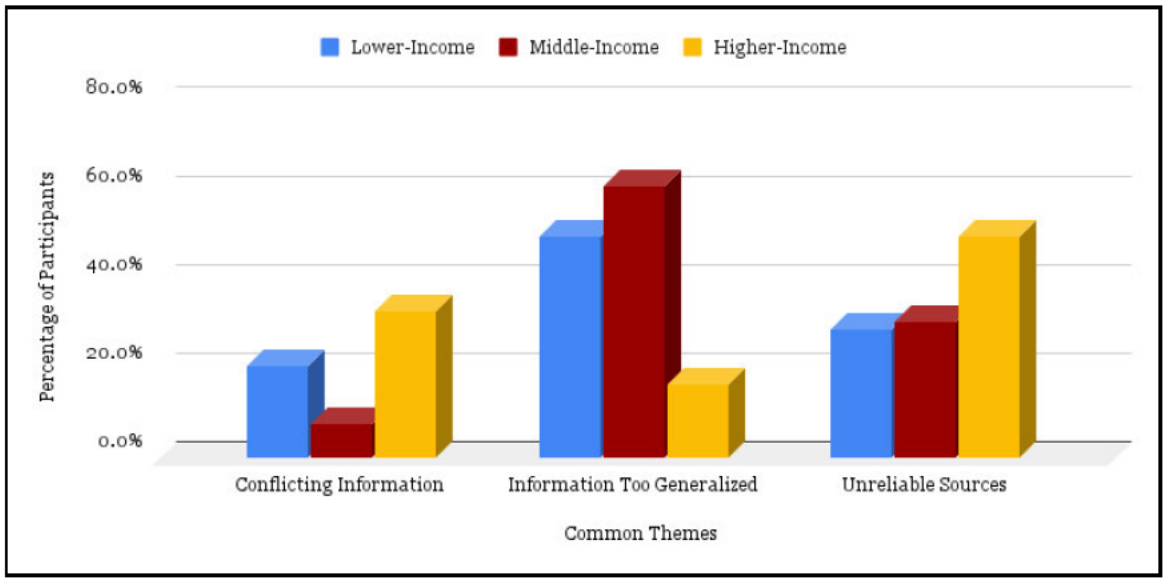

Figure 9. Common Barriers to Obtaining Food and Nutrition Information

"When you look for information, what challenges do you encounter for receiving proper food and nutrition information?"

**Percentage shows participants that responded to the question and reported barriers derived from common themes (n = 43).*

3.9 IDEAS FOR IMPROVEMENT IN SEEKING EXPERIENCE

Some participants reported ideas for improvement in their experience of seeking pregnancy-related food and nutrition information. For the most part, participants expressed the need for sources of information that can be accessed whenever needed. Also, there is a need for sources to guide women on how to implement pregnancy-related food and nutrition information without having to interpret complex information for themselves. The majority of suggestions were tailored towards having one robust source to find reliable and credible information that is also readily accessible online. One participant suggested, "a platform where healthcare professionals can share best practices in prenatal nutrition care". Another participant suggested a "collaborative platform where researchers, healthcare professionals, and patients can share insights". Results suggest that women often find that sources are not readily available and are generally not tailored to be understood by all pregnant women.

Table 2. Summary Table of Significance Between Groups

	Lower-Income (n= 98)	Middle-Income (n= 82)	Higher-Income (n= 31)	*p*-value*
Race/Ethnicity, n(%)				< .001
Hispanic, Latino(a/x), or Spanish	24 (24.5)[a]	5 (6.1)[b]	3 (9.7)[a,b]	
Black or African-American	1 (1)[a]	1 (1.2)[a]	6 (19.4)[b]	

American Indian or Alaska Native	0 (0)[a]	0 (0)[a]	1 (3.2)[a]	
White	71 (72.4)[a]	76 (92.7)[b]	19 (61.3)[a]	
Native Hawaiian or Other Pacific Islander	0 (0)[a]	0 (0)[a,b]	2 (6.5)[b]	
Southeast Asian	2 (2)[a]	0 (0)[a]	0 (0)[a]	
Current Stage of Pregnancy, n(%)				.016
1-12 weeks	42 (43.3)[a]	37 (45.7)[a]	8 (26.7)[a]	
13-27 weeks	33 (34)[a]	40 (49.4)[a]	16 (53.3)[a]	
28-40 weeks	22 (22.7)[a]	4 (4.9)[b]	6 (20)[a]	
Prenatal Topics During Health Visit, n(%)				
Gestational weight gain	47 (48)[a]	57 (69.5)[b]	18 (58.1)[a,b]	.014
Limiting food sources such as fish high in mercury	46 (46.9)[a]	55 (67.1)[b]	19 (61.3)[a,b]	.022
Monitoring caffeine intake	46 (46.9)[a,b]	45 (54.9)[b]	9 (29)[a]	
Sources, n(%)				
OB-GYN	44 (44.9)[a]	61 (74.4)[b]	22 (71)[b]	< .001
Registered Dietitian or Nutritionist	12 (12.2)[a]	24 (29.3)[b]	17 (54.8)[c]	< .001
Friend	41 (41.8)[a]	44 (53.7)[a]	5 (16.1)[b]	.002
Most Helpful Source, n(%)				< .001
Internet	24 (24.5)[a]	14 (17.1)[a]	10 (32.3)[a]	
Books	1 (1)[a]	4 (4.9)[a,b]	4 (12.9)[b]	

Primary Care Doctor	0 (0)[a]	5 (6.1)[b]	5 (16.1)[b]	
OB-GYN	18 (18.4)[a]	26 (31.7)[a]	6 (19.4)[a]	
Registered Dietitian or Nutritionist	8 (8.2)[a]	6 (7.3)[a]	5 (16.1)[a]	
Family	1 (1)[a]	0 (0)[a]	1 (3.2)[a]	
Friend	17 (17.3)[a]	13 (15.9)[a,b]	0 (0)[b]	
Information Sought, n(%)				
Prenatal Supplements	8 (8.2)[a]	32 (39)[b]	24 (77.4)[c]	< .001
Gestational diabetes or other nutrition-related pregnancy complications	69 (70.4)[a]	52 (63.4)[a]	5 (16.1)[b]	< .001
Other	0 (0)[a]	0 (0)[a,b]	2 (6.5)[b]	.003
Recommended to See A Registered Dietitian, n(%)	78 (79.6)[a,b]	75 (91.5)[b]	21 (67.7)[a]	.007
Experience Seeking Information, n(%)				< .001
Extremely Easy	9 (9.2)[a]	9 (11)[a]	10 (32.3)[b]	
Somewhat Easy	51 (52)[a]	37 (45.1)[a]	9 (29)[a]	
Neither Easy Nor Difficult	34 (34.7)[a]	36 (43.9)[a]	7 (22.6)[a]	
Somewhat Difficult	1 (1)[a]	0 (0)[a]	5 (16.1)[b]	

Note: Significance determined using Bonferroni adjustment. Within a row, frequencies without a common superscript are significantly different.

**Significance determined when $p < .05$.*

CHAPTER 4: DISCUSSION

Currently, there is a plethora of research focused on the food and nutrition information sources women seek during pregnancy. However, there is limited research on the information-seeking behaviors of lower-income pregnant women and the sources they use to seek information (Snyder et al., 2020). Additionally, research exploring the comparison of seeking behavior of pregnant women over socioeconomic status is limited. To our knowledge, this study is one of the first to investigate if first-time pregnant women across income groups are being recommended to see a Registered Dietitian for food and nutrition information and identify who is providing the recommendation.

In this study, findings suggest that roughly half of the lower-income pregnant women were discussing food and nutrition-related topics with their healthcare provider during their prenatal health visits. Specifically, topics related to gestational weight gain, limiting consumption of fish high in mercury, increasing iodine in their diet, limiting added sugar consumption, and monitoring caffeine intake, were reported to have not been discussed by more than half of the women in the lower-income group. However, discussing the topic of prenatal vitamins or folic acid supplements with a healthcare provider was reported by most women in the lower-income (65.3%), middle-income (69.5%), and higher-income (87.1%) groups. Similarly, Jackson et al. (2023) found that over 50% of pregnant women across various ages, races, and income statuses, reported not receiving nutrition counseling throughout their pregnancy.

The findings of this study suggest that lower-income and higher-income pregnant women frequently sought pregnancy-related food and nutrition information through the internet and their Primary Care Doctor. Similarly, the middle-income group frequently

used the internet and their Primary Care Doctor, with the addition of their OB-GYN being a frequently used source. Similarly, recent research studies have found that pregnant women report primarily using the internet, their healthcare provider, and books for information (Lobo et al., 2020; Daigle et al., 2022; Olsen et al., 2020; Huberty et al., 2013; Lindsay, Le, et al., 2021; Mercado et al., 2017; Snyder et al., 2020; Downs et al., 2014; Kraschnewski et al., 2014; Narasimhulu et al., 2016; Ledoux et al., 2015; Cohen & Koski, 2013; Lindsay, Wallington, et al., 2017; Grenier et al, 2021). A Registered Dietitian or nutritionist was the least used source among lower-income and middle-income groups compared to other sources. Specifically, women in the higher-income group were more likely to use a Registered Dietitian or nutritionist as a source compared to the middle-income. However, women in the lower-income group were significantly less likely to use a Registered Dietitian or nutritionist as a source compared to women in the middle-income group. In a study by Mistital et al. (2023), findings suggest that pregnant women rarely use Registered Dietitians or nutritionists as a source for information, however, women are interested in meeting with a Registered Dietitian or nutritionist as part of their routine prenatal care. Specific sources reported in our study included pregnancy guidebooks, AmericanPregnancy.org, the Mayo Clinic website, online blogs, and pregnancy support groups. More so, women reported using Google as their primary search engine when seeking pregnancy-related food and nutrition information online.

Additionally, women in the lower-income (8.3%) and middle-income (39%) groups searched the least for information regarding prenatal vitamins or folic acid supplements in comparison to the higher-income (77.4%) group. Lower-income pregnant

women were more likely to seek information on gestational diabetes or other nutrition-related complications. The majority of women sought information regarding foods to limit or avoid during pregnancy (81.3%). Yet, many women reported discussing food-related dietary restrictions during a prenatal health visit. This knowledge gap could be attributed to inadequate nutrition counseling provided by healthcare providers during prenatal visits (Mercado et al., 2017; Downs et al., 2014; Lindsay, Wallington, et al., 2017).

Another important finding of this study was that pregnant women were mostly being recommended to see a Registered Dietitian for pregnancy-related food and nutrition information from a family member or friend. Whereas, fewer women were recommended to see a Registered Dietitian during pregnancy by their Primary Care Doctor or OB-GYN. Specifically, higher-income women were more likely to be recommended to see a registered Dietitian by a healthcare provider compared to lower-income women. This finding should be researched further to determine why lower-income women are being recommended to see a Registered Dietitian by their healthcare provider less often compared to women with higher-income status. Future research should focus on possible barriers to healthcare professional recommendations comparing income status and how it can be improved.

Interestingly, all women had applied the information they found to their daily lives. For the most part, women reported applying information was easy or not easy or difficult. Additionally, the experience of seeking information was identified to be easy. However, expressed inconsistent and contradictory information was a common barrier to their information-seeking experience. There was a common concern over the reliability of

the information found through sources used, with one participant stating that “not all websites and books are reliable sources of information, and pregnant women need to choose carefully”. Women suggested that an accessible platform for healthcare providers and researchers to share pregnancy-related food and nutrition information would improve their information seeking experience. Pregnant women want improved access to reliable online resources, particularly those endorsed by healthcare professionals, to ensure they receive accurate and trustworthy information (Snyder et al., 2020). Even so, available information is generalized and not tailored to specific needs. Some women experienced difficulty finding food and nutrition information inclusive to their special dietary needs.

To address these issues, the integration of Registered Dietitians and nutritionists as part of prenatal care health is essential to provide women with adequate, credible, and individualized food and nutrition information throughout their pregnancy. Future interventions are needed that facilitate easily accessible, credible sources of information void of complex medical terminology for women during pregnancy. These interventions should involve their healthcare providers, as well as Registered Dietitians and nutritionists, as dependable sources of information throughout prenatal care.

STRENGTHS AND LIMITATIONS

This study focused on lower-income pregnant women and their food and nutrition information-seeking behaviors, which this area has limited research. One strength of this study includes the cross-sectional approach, which collected qualitative data from a large sample population.

One limitation of this study was the lack of diversity in the sample population, as participants were primarily white and married. The absence of racial and ethnic diversity

may have limited reports of cultural characteristics that can influence information seeking behaviors. Since this study collected data through a survey, there can be bias in responses and participants. The possibility of sampling bias may have occurred as women choosing to participate may differ systematically from those who decline. Additionally, participants were asked to self-report their past information-seeking experience, which may have resulted in recall bias since we asked participants to recall times they have sought nutrition information and describe their experience doing so. Pregnant women may not accurately recall their experiences or give socially desired responses. Lastly, limitations are also seen in our methods and design. The recruitment of participants is a convenience sample since we asked for volunteers. The population of pregnant women who participated in the study has provided valuable information, however, findings may not relate to the whole population. The survey only being available in an online format may have influenced the internet being reported as a frequently used source. Women who are less likely to use the internet may have been less inclined to participate, whereas women who are frequent users of the internet may have been more inclined to participate in the online survey.

CHAPTER 5: CONCLUSION

This mixed-methods cross-sectional study showed that the internet is a crucial source of information, and healthcare providers, Registered Dietitians, and nutritionists should be more involved in the facilitation of food and nutrition information during pregnancy. Although women suggested being happy with the information they found, they also identified major barriers that made finding the information they needed not as easy, mostly due to the abundance of information and lack of easily accessible and reliable sources. Registered Dietitians and nutritionists provide evidence-based nutritional guidance, healthcare providers who are essential in prenatal care, are not recommending women to see a Registered Dietitian for food and nutrition information during pregnancy. Notably, more women reported a family member or friend recommending them to see a Registered Dietitian for food and nutrition information. Future research should focus on possible barriers to healthcare professional recommendations and how it can be improved.

The internet was identified as a common source used by pregnant women among all three socioeconomic statuses. However, many women identified that the internet is overwhelmed with so much information that it is difficult to determine reliable sources. The information provided is contradictory and too generalized, making it difficult to easily find the information they need. To combat these barriers, there is a need to enhance the accessibility of information sources tailored to all pregnant women, facilitate communication with healthcare providers for resources of information, and integrate Registered Dietitians as a mandatory component of prenatal care.

APPENDICES

APPENDIX A: RECRUITMENT MATERIALS

Flyer in English

Are you currently pregnant?

Soon to be a first-time Mom?

- If you answered YES to both questions, consider taking this survey!
- We are looking to explore the resources women use to seek food and nutrition information during pregnancy.
- This survey will take only 15-25 minutes to complete.
- Upon completing the survey, you will be entered into a raffle with a chance to receive a **$20.00 Amazon gift card**.
- Scan the QR code to start the survey.

Sydni Hebert, Graduate Student in the Nutrition and Food Studies Department is conducting this study. If you are interested in participating or have more questions, please contact them at (973) 718-0157 or heberts2@mail.montclair.edu

This study has been approved by the Montclair State University Institutional Review Board, MSU IRB #FY23-24-3124

MONTCLAIR STATE UNIVERSITY

Flyer in Spanish

¿Actualmente está embarazada?

¿Pronto será madre primeriza?

- Si ha respondido SÍ a ambas preguntas, considere la posibilidad de participar en esta encuesta.
- Nosotros queremos explorar los recursos que utilizan las mujeres para buscar información sobre alimentación y nutrición durante el embarazo.
- Completar esta encuesta le tomará solo 15 a 25 minutos.
- Al completar la encuesta, entrará a un sorteo con la posibilidad de recibir una **tarjeta de regalo Amazon con 20 dólares**
- Escanee el código QR para iniciar la encuesta.

Sydni Hebert, estudiante de posgrado del Departamento de Nutrición y Estudios Alimentarios, está llevando a cabo este estudio. Si usted está interesado en participar o tiene más preguntas, por favor póngase en contacto con nosotros al (973) 718-0157 o heberts2@mail.montclair.edu

Este estudio ha sido aprobado por la Junta de Revisión Institucional de la Universidad Estatal de Montclair, MSU IRB #FY23-24-3124

MONTCLAIR
STATE UNIVERSITY

Email Recruitment through Montclair State University

Dear MSU Student,

I am writing to let you know about an opportunity to participate in a research study about where women find food and nutrition information during pregnancy and their searching experience. This study will involve an anonymous online survey. No one can connect your answers back to you and you can skip or stop the survey at any time.

It will take about 15-25 minutes of your time.

If you are 18 years old or older, read English or Spanish, and currently pregnant with your first child you may be eligible to participate.

To compensate you for your time taking this study, you will be entered into a raffle with a chance to win a $20.00 Amazon gift card. To receive compensation, you must complete the survey and provide your email address by clicking the link in the message at the end of the survey. If selected, a link for the prize will be sent to the email address you provide.

If you have any questions, please contact Sydni Hebert at heberts2@montclair.edu.

Thank you for considering participation in this study. This study has been approved by the Montclair State University Institutional Review Board, Study no. FY23-24-3124.

Sincerely,

Sydni Hebert, Masters Student

Nutrition and Food Studies Department, Montclair State University

Facebook Posts

Facebook Post in English:

Are you currently pregnant? Soon to be a first-time mom? If you answered “yes”, you should consider participating in this survey conducted by Sydni Hebert, a Graduate student at Montclair State University! We want to hear about your experience on the resources you use to seek nutrition information during pregnancy. Being in this study is optional and the survey is anonymous. This survey will take only 15-25 minutes to complete. Upon completing the survey, participation will enter you into a raffle where you will have the chance to receive a $20.00 Amazon gift card. Click this link to access the survey: https://montclair.co1.qualtrics.com/jfe/form/SV_6QXn6TpFTdav14i
For more information, please contact Sydni Hebert at (973) 718-0157 or heberts2@mail.montclair.edu.

Facebook Post in Spanish:

¿Actualmente está embarazada? ¿Pronto será madre por primera vez?
Si respondió "sí", usted debe considerar participar en esta encuesta realizada por Sydni Hebert, ella es una estudiante de posgrado de la Universidad Estatal de Montclair. Queremos conocer su experiencia acerca de los recursos que utiliza para buscar información nutricional durante el embarazo. Participar en este estudio es opcional y la encuesta es totalmente confidencial. Completar esta encuesta le llevará entre 15 y 25 minutos solamente. Al finalizar este proceso usted ingresará a una rifa donde tendrá la oportunidad de recibir una tarjeta de regalo Amazon con 20 dólares. Haga clic en este enlace para acceder a la encuesta:
https://montclair.co1.qualtrics.com/jfe/form/SV_cVcYSChjJCMb6rc
Para obtener más información, puede comunicarse con Sydni Hebert al heberts2@mail.montclair.edu.

North Hudson WIC Text Message

English Text Message Script:

Hello! If you are currently pregnant with your first child, you may be interested in participating in this survey. Sydni Hebert, a Graduate student from Montclair is conducting a research study to learn more about the resources women use to seek nutrition information during pregnancy. Click this link to access the survey: https://montclair.co1.qualtrics.com/jfe/form/SV_6QXn6TpFTdav14i

Spanish Text Message Script:

¡Hola! Si actualmente está embarazada de su primer hijo, es posible que le interese participar en esta encuesta. Sydni Hebert, es una estudiante de posgrado de Montclair, que está realizando un estudio de investigación para conocer más sobre los recursos que utilizan las mujeres para buscar información nutricional durante el embarazo. Haga clic en este enlace para acceder a la encuesta: https://montclair.co1.qualtrics.com/jfe/form/SV_cVcYSChjJCMb6rc

APPENDIX B: PARTICIPANT CONSENT FORMS

Prospective Agreement Form in English

MONTCLAIR
STATE UNIVERSITY

Online Survey Prospective Agreement Form
FOOD AND NUTRITION INFORMATION SEEKING METHODS OF WOMEN DURING PREGNANCY
STUDY #: (i.e. FY23-24-3124)

We are asking you to be in a research study being done by Sydni Hebert, graduate student at Montclair State University. Being in this study is optional.

If you choose to be in this study, you will complete a survey. This survey will help us learn more about where women find food and nutrition information during pregnancy and their searching experience. The survey will take about 15-25 minutes to complete. To be in this study you must be 18 years old or older, read Spanish and/or speak and read English, and pregnant with your first child.

You can skip questions or stop the survey at any time. The survey is anonymous. No one can connect your answers to you.

When taking this survey, you may have feelings of discomfort sharing your experience and information you searched for. Others can benefit from this study by learning sources pregnant women use for food and nutrition information, common challenges, and ways to improve the experience. Participants that complete the survey will be entered into a raffle with a chance to win a $20.00 Amazon gift card. If selected, a link for the prize will be sent to the email address you provide after the survey.

We advise you to not use an employer issued electronic device, laptop, phone or WIFI to complete this survey. Many employers monitor use of these devices.

Questions about the study? Please contact Sydni Hebert, graduate student in the Nutrition and Food Science Program at Montclair State University at heberts2@montclair.edu or Dr. Bai, Chair and Professor in the Department of Nutrition and Food Studies at Montclair State University at baiy@montclair.edu

Any questions or concerns about your rights as a research participant? You can call the MSU Institutional Review Board at 973-655-7583 or email reviewboard@montclair.edu

This study has been approved by the Montclair State University Institutional Review Board.

If you want to be in this study, click the Agree button to start the survey.

Prospective Agreement Form in Spanish

MONTCLAIR
STATE UNIVERSITY

Formulario de acuerdo de la encuesta en línea
MÉTODOS DE BÚSQUEDA DE INFORMACIÓN ALIMENTARIA Y NUTRICIONAL DE MUJERES DURANTE EL EMBARAZO
STUDY #: (i.e. FY23-24-3124)

Nosotros le pedimos a usted que participe en el estudio de investigación realizado por Sydni Hebert, estudiante de posgrado de la Universidad Estatal de Montclair. La participación en este estudio es opcional.

Si usted decide participar en este estudio, tendrá que llenar una encuesta. Esta encuesta nos ayudará a conocer mejor dónde las mujeres encuentran información sobre alimentación y nutrición durante el embarazo y su experiencia durante esta búsqueda. Completar la encuesta toma alrededor de 15 a 25 minutos. Para participar en este estudio usted debe tener 18 años o más, leer en español y/o hablar y leer en inglés, y estar embarazada de su primer hijo.

Usted puede omitir preguntas o interrumpir su participación en la encuesta en cualquier momento. La encuesta es anónima y nadie podrá relacionar sus respuestas con usted.

Al realizar esta encuesta, es posible que se sienta incómoda al compartir su experiencia y la información que ha buscado. Otras personas pueden beneficiarse de este estudio al conocer las fuentes que utilizan las mujeres embarazadas para obtener información sobre alimentación y nutrición, los problemas más comunes y las formas de mejorar la experiencia. Los participantes que completen la encuesta entrarán en un sorteo con la posibilidad de ganar una tarjeta de regalo Amazon con 20 dólares. En caso de ser seleccionada, usted recibirá un enlace del premio al correo electrónico que proporcionará al finalizar la encuesta.

Le aconsejamos que no utilice ningún dispositivo electrónico, ordenador portátil, celular o servicio de internet proporcionado por algún empleador para completar esta encuesta. Muchas empresas monitorean el uso de estos dispositivos.

Si tiene alguna pregunta acerca de este estudio, por favor contacte a Sydni Hebert, estudiante de posgrado del Programa de Nutrición y Ciencias de la Alimentación de la Universidad Estatal de Montclair, al correo electrónico heberts2@montclair.edu, o la Dra. Bai, presidente y profesor del Departamento de Nutrición y Estudios Alimentarios de la Universidad Estatal de Montclair al correo baiy@montclair.edu.

¿Alguna pregunta o duda sobre sus derechos como participante de una investigación? Usted puede llamar a la Junta de Revisión Institucional de la Universidad Estatal de Montclair al 973-655-7583 o enviar un correo electrónico a reviewboard@montclair.edu.

Este estudio ha sido aprobado por la Junta de Revisión Institucional de la Universidad Estatal de Montclair.

Si desea participar en este estudio, haga clic en el botón Aceptar para iniciar la encuesta.

APPENDIX C: SURVEY QUESTIONS

Survey in English

Q1 What was your age on Jan 1, 2023?

_____

Q2 How would you describe yourself?

- o Hispanic, Latino(a/x), or Spanish
- o Black or African-American
- o American Indian or Alaska Native
- o White
- o East Asian
- o Middle Eastern
- o Native Hawaiian or Other Pacific Islander
- o South Asian
- o Southeast Asian
- o Multiracial or Multi-ethnic
- o Race/Ethnicity not listed

_____

- o Unknown/Prefer not to answer

Q3 What is your marital status?

- o Single, never married
- o Married
- o Divorced
- o Separated
- o Widowed

Q4 What stage of pregnancy are you currently in?

- o 1-12 weeks
- o 13-27 weeks
- o 28-40 weeks

Q5 What category best describes your total annual household income last year?

- o Less than $49,999
- o $50,000-$79,999
- o $80,000-$99,999
- o $100,000 or more
- o Prefer not to answer

Q6 During any of your prenatal visits, did a healthcare provider talk to you about any of the following? Select all that apply:

- ☐ How much weight I should gain during pregnancy
- ☐ Taking prenatal vitamins or folic acid supplements
- ☐ Choosing fish and seafood low in mercury
- ☐ Need for increased iodine in diet during pregnancy
- ☐ Limiting added sugar consumption in my diet
- ☐ Monitoring caffeine intake during pregnancy
- ☐ ⊗None of the above

Q7 What sources do you use when looking for pregnancy-related food and nutrition information? Select all that apply:

- ☐ Internet
- ☐ Books
- ☐ Primary Care Doctor
- ☐ OBGYN
- ☐ Nutritionist
- ☐ Registered Dietitian
- ☐ Family
- ☐ Friends
- ☐ Other _____
- ☐ ⊗None, I never looked

Q8 Which source used to seek pregnancy-related food and nutrition information was most helpful to you?

- o Internet
- o Books
- o Primary Care Doctor
- o OBGYN
- o Nutritionist
- o Registered Dietitian
- o Family
- o Friends
- o Other
- o ⊗None, I never looked

Q9 During what stage of your pregnancy did you start searching for pregnancy-related food and nutrition information?

- o Before Pregnancy

- o 1-12 weeks
- o 13-27 weeks
- o 28-40 weeks

Q10 During your pregnancy, have you ever been recommended to meet with a Registered Dietitian for food and nutrition information?

- o Yes
- o No

Q11 Who recommended you to meet with a Registered Dietitian?

- o Family
- o Friend
- o Primary Care Doctor
- o OBGYN
- o Other _____

Q12 **What sources of information** do you use when looking for pregnancy-related food and nutrition information? (Ex: AmericanPregnancy.org, Pregnancy Guide Books, OBGYN, etc.)

_____

Q13 Were you happy with the information you found?

- o Yes
- o No

Q14 Why not?

_____

Q15 What information were you looking to find?

- ☐ Prenatal vitamins or folic acid supplements
- ☐ Adequate weight gain throughout pregnancy
- ☐ Foods to limit or avoid during pregnancy
- ☐ Gestational Diabetes or other nutrition-related pregnancy complication
- ☐ Other _____

Q16 With the information you found, did you apply it to your daily life?

- o Yes
- o No

Q17 How easy was it to apply?
- o Extremely easy
- o Somewhat easy
- o Neither easy nor difficult
- o Somewhat difficult
- o Extremely difficult

Q18 When you look for information, what challenges do you encounter for receiving proper food and nutrition information?

_____

Q19 How was your experience searching for pregnancy-related food and nutrition information?
- o Extremely easy
- o Somewhat easy
- o Neither easy nor difficult
- o Somewhat difficult
- o Extremely difficult

Q20 What changes would you like to see to improve your experience?

_____

Survey in Spanish

Q1 ¿Qué edad tenía el 1 de enero de 2023?

_____

Q2 ¿Cómo se describiría a sí mismo?
- o Hispano, Latino(a/x) o Español
- o Negro o Afroamericano
- o Indio Americano o Nativo de Alaska
- o Blanco
- o Asiático Oriental
- o Oriente Medio
- o Nativo de Hawai u otras islas del Pacífico
- o Asiático del Sur
- o Asiático del Sudeste
- o Multirracial o multiétnico
- o Raza/etnia no enlistada

_____

- o Desconocido/Prefiero no contestar

Q3 ¿Cuál es su estado civil?

- o Soltera, nunca casada
- o Casada
- o Divorciada
- o Separada
- o Viuda

Q4 ¿En qué fase del embarazo se encuentra actualmente?

- o 1-12 semanas
- o 13-27 semanas
- o 28-40 semanas

Q5 ¿Qué categoría describe mejor los ingresos totales anuales de su hogar el año pasado?

- o Menos de 49.999 $
- o $50,000-$79,999
- o $80,000-$99,999
- o $100,000 o más
- o Prefiero no contestar

Q6 Durante alguna de sus visitas prenatales, ¿Un profesional de salud le hablo acerca de alguno de los siguientes temas? Seleccione todas las que corresponda:

- ▢ Cuánto peso debo ganar durante el embarazo
- ▢ Tomar vitaminas prenatales o suplementos de ácido fólico
- ▢ Elegir pescados y mariscos bajos en mercurio
- ▢ Necesidad de aumentar el yodo en la dieta durante el embarazo
- ▢ Limitar el consumo de azúcar añadido en mi dieta
- ▢ Controlar la ingesta de cafeína durante el embarazo
- ▢ ⊗Ninguna de las anteriores

Q7 ¿Qué fuentes utiliza cuando busca información sobre alimentación y nutrición relacionada con el embarazo? Seleccione todas las que corresponda:

- ▢ Internet
- ▢ Libros
- ▢ Médico de cabecera
- ▢ Ginecología y obstetricia
- ▢ Nutricionista
- ▢ Profesional con Registro Dietético (RD/RDN)

- ☐ Familia
- ☐ Amigos
- ☐ Otros _____
- ☐ ⊗Ninguno, nunca busque

Q8 ¿Qué fuente utilizada para buscar información sobre alimentación y nutrición relacionada con el embarazo le resultó más útil?

- o Internet
- o Libros
- o Médico de cabecera
- o Ginecología y obstetricia
- o Nutricionista
- o Profesional con Registro Dietético (RD/RDN)
- o Familia
- o Amigos
- o Otros
- o ⊗Ninguno, nunca busque

Q9 ¿En qué fase del embarazo empezó a buscar información sobre alimentación y nutrición relacionada con el embarazo?

- o Antes del embarazo
- o 1-12 semanas
- o 13-27 semanas
- o 28-40 semanas

Q10 Durante su embarazo, ¿le han recomendado alguna vez que acuda a un profesional con Registro Dietético (RD/RDN) para obtener información sobre alimentación y nutrición?

- o Sí
- o No

Q11 ¿Quién le recomendó que se reuniera con un profesional con Registro Dietético (RD/RDN)?

- o Familia
- o Amigo
- o Médico de cabecera
- o Ginecología y obstetricia
- o Otro _____

Q12 ¿**Qué fuentes de información** utiliza cuando busca información sobre alimentación y nutrición relacionada con el embarazo? (Por ejemplo: AmericanPregnancy.org, guías de embarazo, obstetricia, ginecología, etc.)

_____

Q13 ¿Estaba feliz con la información que encontró?

- o Sí
- o No

Q14 ¿Por qué no?

_____

Q15 ¿Qué información buscaba?

- ☐ Vitaminas prenatales o suplementos de ácido fólico
- ☐ Aumento de peso adecuado durante todo el embarazo
- ☐ Alimentos que deben limitarse o evitarse durante el embarazo
- ☐ Diabetes gestacional u otra complicación en el embarazo relacionada con la nutrición
- ☐ Otros _____

Q16 Con la información que encontró, ¿Aplicó a su vida diaria?

- o Sí
- o No

Q17 ¿Qué tan fácil fue implementarlo?

- o Extremadamente fácil
- o Algo fácil
- o Ni fácil ni difícil
- o Algo difícil
- o Extremadamente difícil

Q18 Cuando busca información, ¿qué dificultades presenta para recibir información nutricional apropiada?

_____

Q19 ¿Cómo fue su experiencia en la búsqueda de información sobre alimentación y nutrición relacionada con el embarazo?

- o Extremadamente fácil
- o Algo fácil
- o Ni fácil ni difícil

- Algo difícil
- Extremadamente difícil

Q20 ¿Qué cambios le gustaría ver para mejorar su experiencia?

_____

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