

**ASSESSING KNOWLEDGE, ATTITUDES, AND BARRIERS TO PRENATAL  
CARE IN WOMEN OF THE IZABAL DEPARTMENT IN GUATEMALA**

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## **ABSTRACT**

UT Southwestern physician assistant and medical students travel for short-term medical missions to rural areas in Guatemala with Refuge International (RI), a non-profit American-based organization. Guatemala has among the highest maternal and infant mortality rates in Latin America. Prenatal care is the most important factor in determining the outcome of pregnancy but is scarce especially in rural Guatemala. As a quality improvement project, we assessed the knowledge, attitudes, and barriers to prenatal care among women in the Izabal Department region, given the lack of prior assessments. We surveyed 23 women attending the RI Health Clinics using a 29-item questionnaire designed through a literature review on the topic. Our survey revealed that almost 43% of women had between 1 to 3 pregnancies, and 75% had at least 1 abortion or miscarriage. A majority (74%) sought prenatal care during their pregnancy, with less than 75% having attended 4 clinic visits or less. A significant association was found when evaluating knowledge that pregnant women should seek prenatal care and receiving prenatal care ( $p=0.037$ ). The main barriers to care reported were transportation and financial barriers. Based on these results, future interventions will be developed focused on advancing prenatal care in the Izabal Department through health awareness, resources and training of healthcare workers.

## INTRODUCTION

The World Health Organization (WHO) states that 99% of all maternal deaths occur in developing and low income countries and therefore improving maternal health is one of its key priorities.<sup>3,8</sup> Various world leaders gathered at the United Nations headquarters in 2015 to develop new WHO Sustainable Development Goals to improve the lives of people all over the world. One of the goals focused on ensuring healthy lives and promoting well-being for all by reducing the global maternal mortality ratio to less than 70 female deaths per 100,000 live births by 2030.<sup>11</sup> Another goal was to ensure universal access to sexual and reproductive health care services which include family planning, information and education, and the integration of reproductive health into national strategies and programmes.<sup>11</sup> Maternal deaths are higher among women living in rural and poorer communities and is a preventable cause of death for many women worldwide.<sup>3,5</sup> Unavailable, inaccessible, unaffordable, and poor quality of prenatal care contribute to maternal deaths due to post-partum hemorrhage, infection, unsafe abortion, and eclampsia.<sup>3</sup> The most common cause of post-partum hemorrhage is uterine atony, which can be treated and prevented if obstetrical care is provided before, during, and after childbirth.

The maternal mortality rate is an indication of the deadly complications women endure during reproductive years secondary to unavailable or low quality of health care, low socioeconomic status and malnutrition.<sup>6</sup> Many women in rural areas die during childbirth because they have limited access to obstetrical care and if this were to be established in the antenatal period, maternal mortality rates will decrease. The indigenous women of Guatemala have a three times higher maternal mortality rate than the non-indigenous women.<sup>6</sup> A majority of maternal deaths are among the indigenous population who have lower education, live in rural regions, and those who live in poverty.<sup>7</sup> These indigenous women primarily live in the worst conditions, have the highest

fertility rates, and the smallest percentage of births attended by a healthcare worker.<sup>6</sup> These women generally die at home with limited access to obstetrical care.<sup>6</sup> Guatemala has among the highest maternal and infant mortality rates in Latin America.<sup>4</sup> The maternal mortality rate is 88 female deaths per 100,000 live births for any cause related to or aggravated by pregnancy or its management, compared to 14 female deaths per 100,000 live births in the United States.<sup>9</sup> The infant mortality rate is 30 deaths at 20-week gestation or greater per 1,000 live births and fetal deaths, compared to 6 per 1,000 live births in the United States.<sup>4,5</sup> Prenatal care is the most important factor in determining the outcome of pregnancy for the infant and mother but is scarce especially in rural Guatemala.<sup>5</sup> Skilled care before, during, and after childbirth can reduce risk of disease and premature deaths in these populations.

According to the WHO, in 2015 only 40% of all pregnant women in low income countries had the recommended prenatal care visits.<sup>3</sup> Although medical care is abundant in the United States, that is not the case in many countries around the world. According to the Centers for Disease Control and Prevention, there are 9.3 physicians per 10,000 population in Guatemala. The WHO reports that countries with fewer than 23 healthcare workers per 10,000 population do not achieve adequate coverage rates for primary healthcare needs.<sup>1</sup> In Central America, access to basic healthcare depends on socioeconomic status and rural or urban location of residence. Rural populations, where the majority of indigenous populations reside, have difficulty accessing basic health services since the majority of health services are in the more developed cities.<sup>1</sup> Many indigenous populations are also unable to afford to travel to developed cities and therefore it is imperative that healthcare workers travel to rural regions of a country to provide medical care. Some indigenous women refuse to attend hospitals in urban areas because they do not trust the hospital providers.<sup>10</sup> RI is a non-profit organization from the United States dedicated to

improving the lives of indigenous populations in Guatemala by organizing medical and non-medical missions that provide medical care, nutrition, clean water, and education. RI works together with the local community members to build a sustainable and trustworthy healthcare model for the villages nearby. Physician assistant and medical students from the University of Texas Southwestern Medical Center (UT Southwestern) travel annually for short-term missions to rural areas in Guatemala with RI to provide medical care to indigenous populations lacking medical care. During these medical mission trips, students are encouraged to conduct needs assessments or quality improvement projects to improve the medical care of the people served by RI and its volunteers. The target of this project is the indigenous female population attending the RI Health Clinic in Sarstun and remote villages in Guatemala.

With post partum hemorrhage being the leading cause of maternal death in Guatemala accounting for 53.3% of maternal deaths, Garcia, et al. designed a study to implement and provide post partum hemorrhage management techniques to midwives in Sarstun, Guatemala. This study aimed to evaluate the effects of culturally sensitive teaching on midwives' traditional nursing knowledge regarding the interventions to treat and prevent postpartum hemorrhage<sup>10</sup>. In this study, 16 midwives participated in an educational intervention at the RI Health Clinic in Sarstun using a pre and post-test design. The results indicated that the educational intervention improved traditional midwives' knowledge and skills regarding managing postpartum hemorrhage. The educational intervention performed by Garcia, et al. benefitted the same population around Sarstun that this project is targeting and therefore we believe that a educational intervention on prenatal care would be also benefit this population. A prenatal needs assessment has not been conducted previously in Sarstun, Guatemala and therefore there is no knowledge on the prenatal care practices in this region. The objectives of this study were to

assess the knowledge, attitudes, and barriers to prenatal care in women attending the RI Health Clinic in Sarstun, Guatemala.

## **METHODOLOGY**

### **Setting**

This project was conducted at a RI Health Clinic located in the remote village of Sarstun, located at the border of Guatemala and Belize on the Sarstoon River. RI is a non-profit American-based organization founded by nurse practitioner Deborah Bell in 2001, that organizes medical mission trips to its four health clinics throughout Guatemala and one in Texas. RI built a health clinic in Sarstun because it has some of the poorest health conditions and located in one of the most remote areas of Guatemala and to improve the medical care of the indigenous population in this region. Sarstun is a 2-hour boat ride from the coastal city of Puerto Barrios, which is a 8-hour bus ride from Guatemala City. RI has drilled a clean water well and pays the salary for 2 school teachers to improve the education of the children in Sarstun. The health clinic is a 3,000 square-foot building composed of six examination rooms, two surgical rooms, a pharmacy, and a waiting area on the first floor. On the second floor there is a kitchen, three private bedrooms, and a large open-air area with plenty beds placed for lodging RI workers and volunteers. The clinic has running water, electricity, showers, and bathrooms, all of which are a luxury to this region. While in Sarstun, we traveled via boat and foot to neighboring remote villages of Rosario and Blue Creek to provide medical care and collect needs assessment data. The duration of survey collection was 2 weeks. The first week consisted of physician assistant students collecting surveys in the villages of Sarstun, Rosario, and Blue Creek. The second week consisted of medical students collecting surveys in the village of Sarstun.



## **Participants**

Since RI built a health clinic in Sarstun, patients have had improved access to medical care. A medical mission group includes physicians, physician assistants, nurse practitioners, and various healthcare professional students that travel to Sarstun approximately four times per year to provide medical and surgical care to the patients attending the health clinic. Patients that attend the health clinic travel by foot and/or boat to be seen for their medical concerns. Inclusion criteria were female patients 18 years or older attending the RI Health Clinics. Exclusion criteria were male gender and less than 18 years of age. Throughout the two weeks, we surveyed 23 indigenous women the RI Health Clinics using a 29-item questionnaire to assess the knowledge, attitudes, and barriers to prenatal care in the women of the Izabal Department of Guatemala.

## **Procedure**

We designed a questionnaire assessing the demographics, prior prenatal care, barriers, knowledge, and practices/beliefs regarding prenatal care of indigenous Guatemalan women of this region. During triage prior to being seen at the health clinic, women were asked if they would like to participate in the survey. Participation was voluntary and did not affect the health care they were provided. If a woman met the inclusion criteria and agreed to participate, the survey questions were asked in the appropriate language and answers were written down on the survey. The questions were translated to and asked in Spanish and/or K'echi' by a translator provided by RI. Surveys remained anonymous and were stored in a folder throughout the duration of the trip. See appendix A for survey in English.

## **Survey Measures**

Content of the survey came from literature review on the topic to include assessing knowledge, attitudes, and barriers of the women attending the RI Health Clinic.<sup>13</sup> The *demographics* section included information such as age, ethnicity, total number of pregnancies, total number of births, total number of children, occupation, members living in the household, and total household income. A thorough *prior prenatal care* history was taken to include whether they had received prenatal care for prior pregnancies and how many visits they had attended. Information was gathered regarding what medical services they received and where they attended their prenatal care and by whom it was provided, whether it was a physician or midwife, etc. Information was collected regarding what *barriers* they had to receiving prenatal care. Women were asked regarding their *knowledge* on prenatal care to include how they knew they were pregnant and whether they know to seek medical care when pregnant. They were asked what they would do if they had pain or vaginal bleeding while pregnant. Additional questions included whether they should or should not eat healthy, drink alcohol, or use tobacco while pregnant. Lastly, they were asked regarding their *practices and beliefs* regarding prenatal care. They were inquired regarding who they seek advice from when pregnant and what activities they should avoid while pregnant. Additional questions included if there's anything special they should do while pregnant to include food/medications, hygiene practice, plants, and what they do for pregnancy symptoms such as nausea, pain, swelling, and miscarriages.

## **Data Analysis**

Responses were analyzed using Survey Monkey and STATA 14.0. Frequencies and measures of central tendency were used to report demographics and background prenatal care

data. Due to the small sample size, Fisher exact tests were used to determine associations between knowledge of seeking prenatal care and various other factors.

## **RESULTS**

### **Demographics**

During our week in the Izabal Department of Guatemala, of the 23 women we surveyed majority (52%) were of the K'echi' Mayan ancestry and 26% were considered Ladinos. Ladinos is a term used to describe non-indigenous Guatemalans.<sup>12</sup> Of the women that agreed to participate in the survey, 65% stated that they were between the age of 21 and 39 years of age. Of the remaining women, 13% were 18 to 20 years of age and 22% were 40 years or older. Majority of the women reported being housewives (64%) while others worked as teachers (5%), midwives (5%), students (9%), or did not work (9%). Fishing provided the primary income for most families. Each household consisted of living with their husband (83%), children (61%), or other individuals (13%). The monthly income averaged from 500 quetzales (\$71) to 5000 quetzales (\$714), but others stated that it depended on fishing while others did not feel comfortable answering that question. Almost half (43%) of women had between 1 to 3 pregnancies, while 26% had between 4 to 6 pregnancies in their lifetime. It was not uncommon to find a woman (9%) who had greater than 13 pregnancies in her lifetime. Over one-third (35%) of women experienced at least 1 abortion or miscarriage throughout their life. See Table 1.

### **Prior Prenatal Care and Barriers to Prenatal Care**

A majority (75%) of women attended 2-4 prenatal visits while only 25% attended more than 5 prenatal care visits. Of the women who had attended prenatal care visits while pregnant,

they either went to the RI Health Clinic in Sarstun (46%), another hospital (46%), or a private clinic (8%). The women living around Sarstun must take a 1 hour boat ride or a 2 hour boat ride to the town of Livingston or the town of Puerto Barrios. At the prenatal care visit they were seen by various healthcare professions to include a nurse (30%), midwife (8%), or doctor (62%). At prenatal visits, only 22% of the women stated that they had an ultrasound done once they knew they were pregnant. Other services reported by the women that were provided included blood and urine testing (35%), physical examination (9%), prenatal vitamins (43%), and vaccinations (35%). We looked at various associations between knowledge of importance of prenatal care and various other factors using the fisher exact test. Knowledge of importance of receiving prenatal care was found to have a significant association with receiving prenatal care ( $p=0.37$ ). Among the 4 women who did not believe that a woman should seek medical care while pregnant, only 1 received prenatal care while pregnant. Among the 15 women who believed that a woman should seek care while pregnant, 13 received prenatal care while pregnant. The main barriers to prenatal care reported were transportation and financial barriers. Two women stated that they got her prenatal vitamins for the first 3 months and then was told she did not need them anymore while another woman stated that the clinic was not adequately supplied and therefore skipped visits. See Table 2 and Figure 1.

### **Knowledge and Beliefs**

Of the women we surveyed in Guatemala, majority (83%) reported that they knew they were pregnant based on their missed period and symptoms of nausea and vomiting. Only 26% reported that they had a urine pregnancy test done. According to a midwife that works in Sarstun, she confirms pregnancy by feeling the fetal heartrate at the umbilicus at 1 month gestation.

Several women (30%) believed that there was nothing a woman should avoid in general throughout her pregnancy. On the survey, several women noted that that women should not sleep and be inactive while pregnant, but that they should continue with their daily activities. Majority of the women reported that a pregnant woman should avoid drinking alcohol (91%), smoking tobacco (100%), doing exercise (21%) and performing heavy lifting (34%). They also believed that pregnant women should eat healthy (91%), eat more vegetables (70%) and eat more fruit (65%). One woman stated that pregnant woman should avoid bitter food because it can cause an abortion.

Alternative medicine is still practiced in this Mayan region; an example of this is that two women stated that they use the Albahaca plant to induce labor and they use hierba mora while pregnant because it contains iron. A midwife shared with me that she recommends cilantro for nausea and that after a miscarriage she recommends yerba elcancer to cleanse the body. When asked about hygiene, 65% of women emphasized importance of bathing daily, which one woman explained that it will help her baby be born healthy. One woman stated that it is important to keep house clean and use eating utensils to avoid illness. When asked who they seek pregnancy advise from, 43% stated they seek advice from their parent or relative while 43% stated they seek pregnancy advice from a healthcare professional or midwife. When asked what they would do if they were to develop signs and symptoms of a miscarriage during pregnancy such as vaginal bleeding and abdominal cramping, 43% of the women stated they would go to a hospital while the other 43% stated that they would do nothing. These women report that majority (48%) of them would present to the RI Health Clinic in Sarstun while others reported they would go to the hospital (22%), see their village midwife (9%), or do nothing (13%). See Table 3.

## **DISCUSSION**

The purpose of this study was to assess the knowledge, attitudes, and barriers to prenatal care of the women attending the RI Health Clinic in Sarstun, Guatemala. Our results indicated a lack of knowledge on the importance of prenatal care for the women surrounding the village of Sarstun. This was evident by the lack of prenatal care visits attended by pregnant women and the fact that majority of the women determined that they were pregnant by their lack of menstruation or pregnant symptoms such as nausea and vomiting. We determined that transportation and cost were the most limiting factors to prenatal care, however when I spoke with a midwife in Sarstun she indicated that culture was a factor too. The Ladino midwife stated that there was a mistrust between the indigenous K'echi' and Ladino women, and therefore the indigenous K'echi' women rarely seek care from the Ladino midwives. A lack of accessibility to proper prenatal care also must be considered since there is no ultrasound equipment available in Sarstun and therefore the women must travel by boat to another town, which is too costly for many families. As we walked into the remote villages of Rosario and Blue Creek, it was evident that the indigenous women in fact did live in harsher and unsanitary conditions. Their water is not clean and causes many gastrointestinal diseases in children and adults, occasionally resulting in death of a loved one. Their schools only go up to 6<sup>th</sup> grade and unless the family can afford to, their children will not obtain a higher education level. Most women get married and pregnant in their adolescent years and start their own family at a very young age. The indigenous people must travel by foot for hours and then by boat to reach the nearest health clinic, which is not financially feasible by many. Therefore, it is evident why indigenous women living farther from Health Clinics do not seek prenatal care with the same urgency as those in Sarstun.

Sarstun is at a great advantage to have a Health Clinic built by RI years ago. Various limitations of this project include the selection bias of women only attending the RI Health Clinic in Sarstun and not all women in the region. This effects the external validity of our study findings, which may not be representative of other areas of Guatemala. The procedure of this project was conducted in this fashion due to time constraint, since the primary goal of the medical mission trip is to provide medical care to the people attending the RI health clinic. Female patients in Sarstun were more willing to participate in the survey compared to the female patients in Rosario and Blue Creek where the K'echi' women lived. This is most likely due to the increased influence of RI bringing in healthcare providers and medical practices from the United States to Sarstun four times a year. Blue Creek and Rosario are remote villages surrounding Sarstun that require hours of hiking to reach and are not frequently exposed to outside influence and therefore the women were more reluctant to participate in the survey. Therefore, the results of this project do not fully represent the prenatal knowledge, barriers, and attitudes of the women living in the remote vilages, which is potentially worse due to the even more decreased access to healthcare. Otherwise, RI has been instrumental in the development of this project. As UTSW students traveling with RI to Sarstun, Guatemala to provide medical care to the people of this region, this project would not be possible without their support and resources. By partnering with RI, we have partnered with the community partner to develop this project based on the interest of the students and the needs of the community.

Guatemala does not meet the WHO Sustainable Development Goal for maternal mortality goal of 70 female deaths per 100,000 live births at 88 female deaths per 100,000 live births.<sup>11</sup> With a little knowledge of the importance of prenatal care, we believe that we can make a difference in the decreasing maternal mortality rates in Guatemala, one village at a time. With one of the WHO

Sustainable Development goals being to ensure access to sexual and reproductive health care services to include family planning, information and education, we determined that a prenatal educational intervention would benefit the population in and around Sarstun. Our results are helping direct future preventative interventions focused on advancing prenatal care through health awareness, resources and training of the women and healthcare workers in the Izabal Department. The indigenous women in this region are more likely to seek advice from their older relatives during pregnancy than their doctors, indicating that we also need to educate and engage the generation above childbearing age. A significant association was found when evaluating knowledge that a pregnant woman should seek prenatal care and attending prenatal care visits, and therefore it is believed that a parental care intervention would be beneficial in this population. UT Southwestern physician assistant and medical students intend to travel to Sarstun, Guatemala in March 2018 and implement a prenatal care intervention to the women attending the RI Health Clinics regarding prenatal care importance, pregnancy lifestyle recommendations, and breastfeeding importance. This qualitative improvement project exemplifies the significance of physician assistants in promoting preventative services to promote health of patients in underserved populations.



## FIGURES AND TABLES

**Table 1: Demographics**

<b>Demographic Characteristics</b>	<b>N</b>	<b>%</b>
<b>Age</b>		
18-20 year of age	3	13%
21-29 years of age	8	35%
30-39 years of age	7	30%
40-49 years of age	2	9%
50-59 years of age	2	9%
60 years of age and older	1	4%
<b>Ethnicity</b>		
Ki'che' (indigenous Guatemalan)	12	52%
Ladino (non-indigenous Guatemalan)	6	26%
Other	5	22%
<b>Number of Pregnancies</b>		
0 pregnancies	3	13%
1-3 pregnancies	10	43%
4-6 pregnancies	6	26%
7-9 pregnancies	3	13%
10-12 pregnancies	0	0%
13-15 pregnancies	2	9%
<b>Number of Births</b>		
All pregnancies resulted in birth	13	65%
1-2 abortions/miscarriages	5	25%
3-4 abortions/miscarriages	1	5%
>4 abortions/miscarriages	1	5%

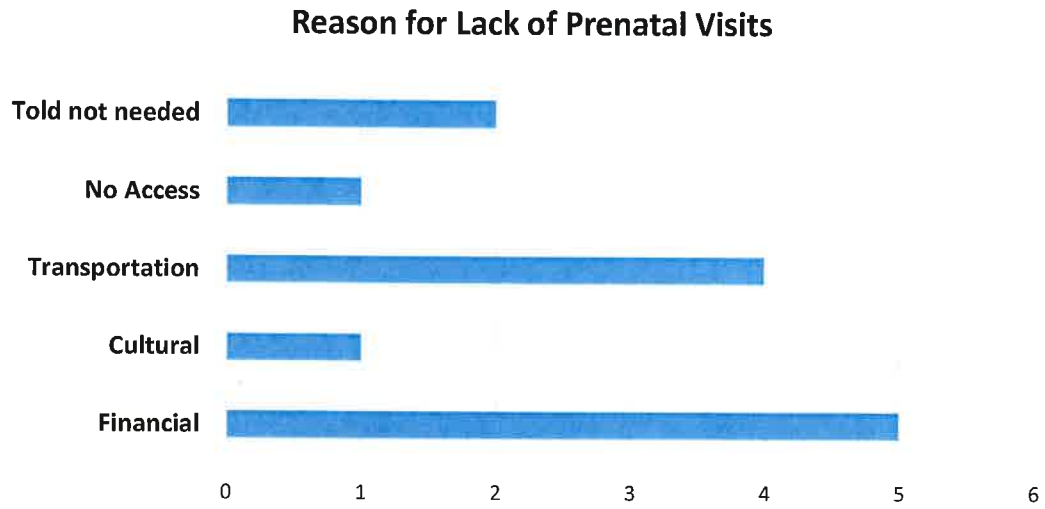
**Table 2: Prior Prenatal Care**

<b>Prenatal Care Statistics</b>	<b>N</b>	<b>%</b>
<b>Number of Prenatal Care Visits</b>		
2-4 prenatal care visits	9	75%
5-7 prenatal care visits	1	8%
>7 prenatal care visits	2	17%
<b>Location of Prenatal Care Visits</b>		
Sarstun Health Clinic	6	46%
Hospital	6	46%
Private Clinic	1	8%
<b>Provider Providing Prenatal Care</b>		
Nurse	4	30%
Midwife	1	8%
Doctor	8	62%
<b>Services Provided</b>		
Urine/blood testing	8	35%
Ultrasound	5	22%
Doppler	2	9%
Physical examination	13	57%
Prenatal vitamins	10	43%
Vaccination	8	35%
<b>Pregnancy Verification</b>		
Missed period	9	40%
Pregnancy symptoms of nausea and vomiting	10	43%
Urine pregnancy test	6	27%
Blood test	3	13%

**Table 3: Knowledge and Beliefs**

<b>Knowledge</b>	<b>N (% Yes)</b>	<b>N (% No)</b>
Should pregnant women smoke tobacco?	0%	100%
Should pregnant women drink alcohol?	9%	91%
Should pregnant women eat healthy?	91%	9%
Should pregnant women avoid heavy lifting?	34%	66%
Should pregnant women avoid exercise?	21%	79%
Should pregnant women eat more vegetables?	70%	30%
Should pregnant women eat more fruits?	65%	35%

**Figure 1: Barrier to Prenatal Care**



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## APPENDIX A: PRENATAL CARE SURVEY

Blurb intro to patients: This survey is intended to help us understand patterns in prenatal care in rural Guatemala and to identify barriers to care. You must be 18 years or older and your participation is voluntary, if you would prefer not to participate it will not effect any of the health care provided to you.

### Demographics:

1. Age:
2. Ethnicity:
3. Total pregnancies:
4. Total births:
5. Total children:
6. Occupation:
7. Who lives in your household?
8. What is your household income?

### Prior prenatal care

- a. If you have been pregnant before, have you ever received prenatal care?
  1. If so, for which pregnancies did you receive prenatal care?
  2. If so, at what point in your pregnancy did you receive prenatal care?
    3. Before the thirteenth week
    4. After the thirteenth week
      1. 14-21 inadequate is 0 or unknown
      2. 22-29 inadequate is 1 or less
      3. 30-31 inadequate is 2 or less
      4. 32-33 inadequate is 3 or less
      5. 34 or more inadequate is 4 or less
- a. If so, how many prenatal care visits did you attend? How often?
- b. Where did you go for prenatal care? Circle what applies.  
At home, birthing hut, government hospital, NGO, pharmacy, private clinic, other
- c. Who of the following provided prenatal care? Circle what applies.  
Doctor, traditional healer, TBA/midwife, relatives, neighbors, other
- d. What services were provided by each above?  
Open ended, but can provide options: height/weight, blood pressure, blood test, urine test, abdomen examined, pelvic exam, ultrasound, doppler, vaccination, iron or folate supplements, prenatal vitamins, etc

**Barriers**

If you have not received prenatal care/education (or began after the first trimester, or received 4 or fewer total visits), why not?

Ask open ended, but can prompt with:

1. Financial/insurance reasons
2. Transportation
3. Not important
4. Didn't know I was pregnant
5. Didn't know where to go
6. Negative experiences at clinic (paperwork, wait times, language barriers)
7. Ambivalent/fearful about being pregnant
8. Could not access care (no providers available, turned away, etc)
9. Couldn't leave work, children, or other obligations
10. Dislike or dissatisfaction of provider/clinic
11. Other fears
12. Family reasons

**Knowledge**

- a. How do you know you are pregnant?
  
- b. Should you seek medical care when pregnant? (Not *do* you but *should* you?)
  
- c. If you had pain or bleeding while you were pregnant, what would you do? Where would you go?
  
- d. Should you eat healthy food during pregnancy? (Not *do* you but *should* you?)
  
- e. Should you drink alcohol during pregnancy? (Not *do* you but *should* you?)
  
- f. Should you smoke or chew tobacco during pregnancy? (Not *do* you but *should* you?)

**Practices/Beliefs**

- a. Who do you seek advice from when pregnant? Why?
  
- b. What activities should pregnant women avoid? Why?

- c. Are there special things a women should do while pregnant? Why?
- d. What food/medications should a pregnant woman eat/avoid? Why?
- e. What hygiene practices should a pregnant woman do? Why?
- f. What plants should you use during pregnancy? Why?
- g. What do you do for pregnancy symptoms, such as: nausea, pain, swelling, miscarriages? Why?