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Predictors Of Prenatal Care Satisfaction Among Pregnant Women In American Samoa

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Abstract

Objectives: Women of reproductive age in American Samoa have a high-risk for pregnancy complications, due to their high levels of overweight and obesity. Prenatal care can mitigate this risk; however, many women do not seek care. The low rate of prenatal care utilization may stem from a low-level of prenatal care satisfaction. By understanding the predictors of prenatal care satisfaction in America Samoa, targets for improvement may be identified, with the ultimate goal of increasing prenatal care utilization.

Methods: A cross-sectional survey was distributed to women (n=174) in the waiting areas of the clinic at the Lyndon B Johnson Tropical Medical Center, Pago Pago. Women were asked about their demographic background, pregnancy traits, and their satisfaction with prenatal care. Complete satisfaction data was obtained for 165 participants. Different components of satisfaction were extracted using principal components analysis. Linear regression was used to examine associations between maternal characteristics and satisfaction score within these individual components and overall.

Results: The satisfaction questionnaire yielded three components: satisfaction with Clinic Services, Accessibility, and Physician Interactions. Waiting two hours or more to see the doctor was a significant predictor of less satisfaction with Clinic Services, Accessibility, and Overall satisfaction compared to waiting less than 30 minutes. Living more than 20 minutes away from the clinic was associated with less satisfaction with Accessibility, Physician Interactions, and Overall, whereas non-residence was associated with greater satisfaction with Accessibility. Women who were employed or on maternity leave were less satisfied with Physician Interactions than women who were unemployed or students. Of women who had previously been pregnant, a previous pregnancy loss was associated with less satisfaction with Physician Interactions compared to women who had not experienced a pregnancy loss. Women who did not attend all of their appointments were less satisfied with their care overall compared to women who did.

Conclusions for Practice: Prenatal care satisfaction is an important determinant of prenatal care utilization. By identifying specific characteristics that predicted lower satisfaction, we are able to guide providers and health services towards improved prenatal care delivery. Prenatal care clinics should focus on making it easier for women to get to the clinics, decreasing waiting times, and increasing quality face time with providers.

Introduction

It has been clearly established that women who are obese during pregnancy and pre-pregnancy are at increased risk for a number of maternal and fetal health complications (Baeten, Bukusi, & Lambe, 2001; Crane, White, Murphy, Burrage, & Hutchens, 2009; Siega-Riz, Siega-Riz, & Laraia, 2006). Obesity in pregnant women is associated with increased prevalence of preeclampsia, gestational diabetes, fetal macrosomia, and stillbirth (Mission, Marshall, & Caughey, 2015). In spite of this, the proportion of United States women of reproductive age who are overweight or obese continues to climb, mirroring trends among the general population; approximately 60% of women of reproductive age are overweight or obese (Zozzaro-Smith et al., 2015). Comparatively, approximately 90% of American Samoan women of childbearing age are overweight or obese (Hawley et al., 2015).

American Samoa is an unincorporated island territory of the United States located about 2400 miles southwest of Hawai'i. The population receives benefits from its affiliation to the US such as Special Supplemental Nutrition Program for Women, Infants and Children (WIC) and Medicaid insurance, but the island still remains a medically underserved and health care professional shortage area (Health Services and Resource Administration, 2016; National WIC Association, 2016).

In the United States, prenatal care attendance is considered to be an important part of the pregnancy process. However, the overall effectiveness of prenatal care services has been challenged due to variations in quality (Alexander & Kotelchuck, 2001). With this knowledge, Wheatley, Kelley, Peacock, and Delgado (2008) explain, it is critical to evaluate prenatal care in terms of "which services are provided when needed, whether they are consistently high quality, and whether patients view them as meeting their needs." Because overweight and obese women

are especially at risk for pregnancy complications, it must be ensured that they enter prenatal care early and receive quality service. Zozzaro-Smith et al. (2015) found that in a population of urban community residents based in the US, increased pre-pregnancy BMI was associated with increased adequacy of prenatal care. However, Hawley et al. (2014) demonstrated that among all American Samoan women surveyed between 2001 and 2008, less than a quarter received adequate prenatal care.

Hawley et al. have established that there is an issue with the adequacy of prenatal care in this population, but it is also important to consider if the women who *are* utilizing prenatal care services feel as if that care is satisfying and meeting their needs. Across all types of medical care, Chemir, Alemseged, and Workneh (2014) explain, "A satisfied patient will recommend [a] center's services, expressing their satisfaction to four or five people, while a dissatisfied patient on the other hand will complain to twenty or more." A woman who is dissatisfied with her care, specifically in the provider-patient interaction is also less likely to follow the prenatal care regimen (Wheatley et al., 2008). Even further, a woman who has an unsatisfying prenatal care experience is less likely to utilize prenatal care in future pregnancies, and as a result public health professionals and clinical providers are unable to provide interventions and treatment to a high risk patient.

The Lyndon B Johnson Tropical Medical Center, the only hospital in American Samoa, has attempted to expand access to prenatal care services by implementing a prenatal care incentive scheme which provides free medical services to women who enroll in care within their first trimester (Hawley et al., 2014). They have also opened additional community health centers where women can access prenatal care (Hawley et al., 2014). However, satisfaction with the care provided has not been evaluated.

This paper aims to explore satisfaction with prenatal care in American Samoa and to identify which patient groups are less satisfied with their care. By identifying these groups, initiatives could be developed to address their specific needs. Furthermore, this information may be used to guide providers and healthcare workers to improve the level of care that they provide in a specific and directed manner. Prior research in other settings has been conducted to examine socio-demographic characteristics in relation to prenatal care satisfaction and has found that variables such as race/ethnicity, occupation, education status, and religion are significantly associated with satisfaction of care (Chemir et al., 2014; Handler, Rosenberg, Raube, & Kelley, 1998; Handler, Rosenberg, Raube, & Lyons, 2003a, 2003b; Jafari, Eftekhar, Mohammad, & Fotouhi, 2010). This study builds on that knowledge and further incorporates qualitative information to elucidate more about the prenatal care experience for pregnant women in American Samoa.

Methods

Survey and Data Collection

A 59-question survey targeting information about utilization, content, and satisfaction with prenatal care was distributed in the prenatal care clinic at the Lyndon B Johnson Tropical Medical Center (LBJTMC), American Samoa between July and August 2014 and again in August 2015. LBJTMC is the only full service hospital on the island. The hospital provides prenatal care to low risk pregnancies, all high-risk pregnancies, and all women in the last trimester of their pregnancy (Hawley et al., 2014). There are other clinics on the island which treat low risk pregnancies for the first two trimesters. These clinics are the Tafuna Family Health Center in Tafuna, the Amouli Community Health Center in Pago Pago, and the Leone

Community Health Center in Pago Pago. Although the survey was only conducted at LBJTMC, participants were asked to report which of the clinics they attended most frequently during their pregnancy.

The eligibility criteria for participation were that all participants must be over 18 years of age and must have attended at least two prenatal care visits before the visit during which they answered the questionnaire, to allow them to adequately reflect on their experience.

Trained study staff approached potential participants, explained the purpose and protocol of the study and gained informed consent. The questionnaires were self-administered and presented questions in both English and Samoan language side-by-side to accommodate local language preferences. Questions covered demographic information, receipt of prenatal care, interactions with health care workers, and prenatal care satisfaction. The questionnaire was based on the Centers for Disease Control Pregnancy Risk Assessment and Monitoring (PRAMS) survey (Center for Disease Control and Prevention, 2016) and the Prenatal Care Satisfaction Questionnaire, which was developed specifically for use in low-income settings (Raube, Handler, & Rosenberg, 1998). All measures were self-reported. An open-ended comment section was included at the end of the survey to solicit participant feedback.

Data was collected from 174 participants in total. One participant was excluded because she was below the age of 18 and did not have consent to complete the survey.

Institutional review boards at Brown University (IRB Protocol #1403001011) and the American Samoa Department of Health reviewed the study protocol and gave their approval.

Predictor Variables

Demographic variables such as age, marital status, resident status, education level, and employment status were included in the analysis. Age was categorized into five-year age groups between 20 and 36 years, with those 20 years and younger and 36 and older were considered separately. Marital status was collapsed into a dichotomous variable of either married or cohabitating versus never married, separated, divorced, or widowed. Participants were classified as a "Resident of American Samoa" or a "Non-resident" because non-residents do not have the same access to government services and benefits as residents. Non-residents were predominantly from the Independent State of Samoa (commonly referred to as Samoa), a neighboring island nearly identical in ethnic background and cultural history. Education level was collapsed into secondary school or less versus higher education as the highest level achieved. There was very little variation in racial/ethnic background in the sample (98% Pacific Islander). Because of this it was deemed inappropriate to examine race/ethnicity as an independent predictor of satisfaction.

Specific maternal characteristics that were included as predictor variables including pre-pregnancy weight, trimester at the time of survey, pregnancy complications, the most visited clinic, parity, distance of their home village from clinic, health insurance, WIC status, appointment attendance, waiting time at the clinic, and pregnancy loss. Pre-pregnancy weight was categorized into data-driven tertiles. Pre-pregnancy weight was examined continuously and with varying categorizations, but this did not impact the results. Body mass index could not be calculated due to substantial misreporting of height in the self-reported questionnaire. The questions about pregnancy complications, health insurance, WIC status, and appointment attendance were asked in a yes/no format. "Clinic distance" was defined as the driving distance

from the most visited clinic to the participant's home village using Google Maps

(www.maps.google.com). Parity was categorized based on the number of live births. Women

who answered yes to a question inquiring about first pregnancy, were categorized as nulliparous

unless they specified a number of live births. The pregnancy loss variable was created by

subtracting the number of pregnancies that resulted in a live birth, from the number times a

woman had been pregnant before this pregnancy. Women that had values above 0 were

considered to have lost a pregnancy and categorized as 1, versus women with 0 or negative

values (due to multiple birth) who had not previously experienced pregnancy loss.

Time spent at the clinic was categorized in 30 minute intervals from 0 minutes to more

than 2 hours. The amount of time spent waiting to see the doctor and spent talking with the

doctor were asked as open ended questions and analyzed as continuous variables.

Outcome Variable: Satisfaction

The Prenatal Care Satisfaction Questionnaire developed by Raube et al. (1998) comprised

22 of the 59 questions on the survey. Response options for each question were on a Likert scale,

from Excellent (5) to Poor (1). No reverse scoring was needed due to the structure of the

questions.

Satisfaction Domains: Principal Component Analysis

An initial principal component analysis (PCA) was conducted on the 22 items with no

rotation. Following the initial PCA, one question (How would you rate the explanation of

treatment options?) registered a loading of less than 0.30 and was removed, likely because few

participants reported complications for which treatment was required. A final principal

component analysis was therefore conducted on the 21 remaining items with oblique rotation
(direct oblimin) in SPSS. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for
the analysis, KMO = 0.943. Bartlett's test of sphericity X^2 (210) = 3756.194, p < 0.001, indicated
that correlations between items were sufficiently large for PCA (Field, 2009). An initial analysis
was run to obtain eigenvalues for each component in the data. Three components had
eigenvalues over Kaiser's criterion of 1 and in combination explained 76.45% of the variance.
Given the sufficiency of the sample size and Kaiser's criterion on three components, we retained
all three components in the final analysis.

Table 2 shows the factor loadings after rotation. The items that cluster on the same
components suggest that component one represents satisfaction with regard to clinic services
(referred to as the "Clinic Services" component), component two, satisfaction with accessibility
(the "Accessibility" component), and component three, satisfaction with physician interactions
(the "Physician Interactions" component). Clinic Services comprises of patient's interactions
with the clinic staff, the services the clinic provides (e.g. nutritional services, laboratory tests and
procedures), and the clinic environment. Accessibility addresses the location of the clinic and the
patient's evaluation of the time they spend at different stages of the appointment. Physician
Interactions refers to the patient's interactions with the physician and their assessment of the
physician's technical skills and medical equipment.

A reliability analysis was run in SPSS to check the Cronbach's Alpha for the questions
within each satisfaction component. The questions within the Clinic Services component, the
Accessibility component, the Physician Interactions component, and Overall satisfaction, all had
high internal reliabilities with Cronbach's alphas = 0.962, 0.892, 0.925, and 0.969 respectively.

We summed the responses from each of the questions within each component to create a satisfaction score for each of the three components, and to create an overall satisfaction score. First, to normalize the scores, and make each component comparable, regardless of the number of questions included, each individual question was multiplied by 20 to change the scale of each question from 1-5 to 20-100 and then the questions within a component were summed to create a satisfaction score for each of the three identified components (Clinic Services, Accessibility, and Physician Interactions). Second, the resulting sum was divided by the number of questions in each component to obtain a component-specific average satisfaction score. Overall satisfaction was calculated by summing all of the transformed questions and dividing by 21. Complete satisfaction data was obtained from 165 (94.8%) participants in total.

Data Analysis

The number of participants per group for categorical variables (as percentages) and means for continuous variables were computed for all participants. The data did not follow a normal distribution. Visual analysis indicated that satisfaction scores skewed slightly to the right, or the higher end of the satisfaction scale. However, the non-parametric tests yielded similar results to the ANOVA. In order to maximize the power, the parametric tests were used to analyze the data. Independent samples t-tests and ANOVA were used to examine unadjusted differences in mean satisfaction scores among different demographic and characteristic variables.

Multivariable linear regression was used to calculate adjusted mean difference estimates in satisfaction scores using SAS Software (version 9.3). Age, parity, resident status, and employment status were kept in all models regardless of statistical significance because of their role as key sociodemographic characteristics of the sample. Other sociodemographic variables

that were associated with the satisfaction outcomes at a p-value of less than 0.1 in bivariate

analyses were included as covariates in the multivariable regression models. The significance

threshold was generous to account for possible under or over-estimation from the ANOVA

analysis. Models were checked for critical assumptions and evaluated for appropriateness

according to variance inflation factor, condition index, leverage, and Cook's distance model

diagnostics (Field, 2009).

One continuous predictor, time spent talking with the doctor, was analyzed independently

against the satisfaction domains using the Pearson Correlation test in SPSS.

Statistical analyses were conducted using SPSS version 22.0 (SPSS Inc., Illinois, USA)

and SAS version 9.3 (SAS Institute Inc. Cary, NC, USA).

Qualitative analysis

Patient feedback was solicited at the end of the questionnaire with the statement, "If you

would like to provide any other information or comment on your prenatal care experience please

do so here." Seventy-five participants (43.1%) chose to provide feedback. All patient comments

written in Samoan were translated into English by study staff. The authors (OA and NH)

independently categorized patient comments based on positive or negative content. If a comment

contained both types of content it was included in both categories. The two reviewers met to

reach consensus on the categorization.

Results

Quantitative

The average age of participants in the sample was 26.7 years. Over 70% of the women in the sample were married or cohabitating with their partner. Over three quarters of the sample were residents of American Samoa. The majority of non-residents were from neighboring Western Samoa. Over 50% of the sample obtained higher education beyond high school completion and at the time of the survey almost 50% of the sample were employed or on maternity leave.

Approximately 57% of the sample was in their third trimester at the time of the survey, which reflects the general prenatal care population at LBJTMC (Hawley et al., 2014). The majority of participants did not report pregnancy complications (89.0%). Approximately 13.5% of participants lived 20 minutes or more from their clinic. Two-thirds of the sample had more than one pregnancy, the average parity being 2.7 births. Of the women who had previously been pregnant, 17.8% of the sample had previously lost a pregnancy. Eighty-four percent of the participants did not have insurance, but almost 92% were on WIC assistance for themselves, their current children or both. Over 90% of participants reported attending all of their scheduled appointments at the time of the interview.

Table 3 presents the normalized mean satisfaction scores for each component. Mean satisfaction score was lowest in the Accessibility component (58.54 points out of 100) and highest in the Physician Interactions component (76.38 points). Overall satisfaction had a normalized mean of 68.4 points.

Unadjusted mean Clinic Services satisfaction scores were negatively associated with clinic distance, employment status, and average waiting time at the clinic (Table 4). Unadjusted Accessibility satisfaction scores were negatively associated with clinic distance and average waiting time at clinic, and positively associated with resident status. Significant negative

differences in unadjusted mean satisfaction score for Physician Interactions were found for clinic distance and employment status. With regards to Overall satisfaction, clinic distance, employment status, and average waiting time at the clinic all resulted in significant negative differences in unadjusted mean score.

The adjusted linear regression models revealed more specific relationships between these maternal characteristics and the various components of satisfaction; these relationships are presented in Table 5. Living 20 minutes or further away from the clinic was associated with significantly lower satisfaction compared to those living less than 10 minutes away for Accessibility, Physician Interactions, and Overall satisfaction. This lower satisfaction ranged from approximately 11 to almost 14 points.

The Clinic Services satisfaction score was 6.9 points lower for women who were employed or on maternity leave compared with unemployed women and students (p = 0.057). Women aged 21-25 demonstrated marginally less satisfaction with Clinic Services compared with 26-30 year olds by 9.1 points (p = 0.056). Women who had to wait two or more hours to see the doctor were 20 points less satisfied with Clinic Services than women who waited less than 30 minutes (p=0.007). Women who reported not attending all of their appointments were approximately 16 points less satisfied with Clinic Services than women who did report attending all of their appointments (p=0.015).

With regards to satisfaction with Accessibility, non-residents were significantly *more* satisfied compared to American Samoan residents by 11.7 points (p=0.009). However, women who waited two hours or more were substantially less satisfied compared to those who waited less than 30 minutes (difference in means score =-19.75208 points, p=0.014).

Satisfaction with Physician Interactions was negatively associated with employment/maternity leave status and previous pregnancy loss. Women who were employed or on maternity leave were 9.2 points less satisfied with Physician Interactions compared to women who were unemployed or students (p=0.030). Among women who had been pregnant before, women who had previously lost a pregnancy were 11.2 points less satisfied than women who had never experienced a pregnancy loss (p=0.036). Women ages 21-25 and 31-35 were less satisfied with Physician Interactions compared to women aged 26-30, although again, this relationship was only marginally significant (difference in means score =-8.86378 points, p=0.088 and difference in means score =-9.95542 points, p=0.078 respectively).

With regards to Overall satisfaction, women who needed to wait at the clinic two hours or more were 14.7 points less satisfied than women who waited less than 30 minutes (p=0.030).

A Pearson correlation test indicated that the amount of time spent speaking with the doctor was significantly correlated with increased satisfaction in Clinic Services (r=.218, p=0.006, n=157), Physician Interactions (r=.189, p=.017, n=159), Overall (r=.214, p=.007, n=156).

Qualitative

75 survey participants gave comments at the end of the survey. Of these 75, 53 of them contained negative statements, and 29 contained positive statements. Predominant themes among the negative survey comments included long waiting times, limited availability of doctors and nurses, and discomfort in the waiting room. For example, one women explained, *"I think that the nurses are very kind. My only problem is the waiting area, the waiting time to see the doctors…I*

feel that regardless of how many patients are waiting to see the doctor, they should try to at least accommodate you and everything you ask."

Some patients implied that the long wait times may be due to factors such as waiting a long time for ultrasounds and the limited availability of doctors and nurses. One woman made this link when she explained, *"Due to the clinic, there should be more ultrasound machines added because that's probably why pregnant women have to wait for long hours or minutes."*

Positive comments were general and commonly related to Overall satisfaction rather than speaking to any of the individual components identified by our quantitative analysis. Survey commenters who did provide more specific comments generally commented about positive interactions with the nurses and doctors in the clinics. But often, this positive feedback also included suggestions or concerns. One participant who attended LBJTMC stated, *"I know the nurses' job and especially the doctor's job is not an easy task. They try their very best to assist pregnant mothers. A job well done to them and do continue your usual jobs. Also allow sufficient time for prenatal care visits. Thank you!"*

Further illustrative comments are included in Table 7. Comments were significantly varied in content and in disposition and often addressed several dimensions with regards to satisfaction. As a result, they were not categorized into specific satisfaction domains.

Discussion

Our results confirm that specific maternal characteristics are associated with overall prenatal care satisfaction and specific components of satisfaction. These characteristics go beyond basic demographic traits and take into account the social and environmental characteristics of women's prenatal experiences. Clinic distance, specifically living more than 20

minutes driving time from the clinic, was a significant predictor of lower satisfaction for

Accessibility, Physician Interactions, and Overall satisfaction. Employment status was

significantly associated with lower satisfaction in the Physician Interactions component and

approaching significance in the Clinic Services component and Overall satisfaction. Waiting

time for an appointment, especially waiting more than 2 hours, was a significant predictor of

lower satisfaction with Accessibility. Non-resident status, was the only positive predictor of

higher satisfaction with respect to Accessibility. Previous pregnancy loss emerged as a pertinent

predictor of lower satisfaction with respect to Physician Interactions. Despite the use of self-

report data, our results were able to account for a substantial amount of the variance in the data.

Satisfaction with Clinic Services accounted for 18.5%; satisfaction with Accessibility, 23.6%;

Physician Interactions, 9.86%; and Overall satisfaction, 15.7%.

Other satisfaction studies have reported similar and related findings. In Ethiopia, Chemir

et al. (2014) found that dissatisfaction with prenatal care was due primarily to long waiting

times, overcrowding in the clinic during the morning, and poor laboratory services. Handler et al.

(2003a) suggested that prenatal care providers should focus on improving provider patient

communication and components of the prenatal care setting such as cleanliness, waiting times,

and availability of ancillary services based on their study of low-income pregnant women in the

United States.

Clinic Distance

Although the island itself is small, most people rely on public transportation. Thus,

travelling over 20 minutes to get to a prenatal appointment would be strenuous for a pregnant

woman, especially later in pregnancy. Clinic distance has been demonstrated to be a key factor in

accessibility of prenatal care services overall and to impact utilization (Simkhada, Teijlingen, Porter, & Simkhada, 2008). In Kenya, an increase in travel time or distance to the nearest health care facility was associated with fewer prenatal care visits (Magadi, Madise, & Rodrigues, 2000). In 2009, the government opened clinics in Amouli and Leone to expand access to care to residents in the Eastern and Western districts (Hawley et al., 2014). However, women are only able to go to these clinics for care until their third trimester after which they must go to LBJTMC exclusively for their care. This requirement may undermine the potential impact of the prenatal care clinic expansion the American Samoan government initiated in 2009. As a result, it is understandable that clinic distance would be such a strong predictor among Accessibility and Overall satisfaction. For Physician Interactions, there may be a theoretical relation between the time a woman takes to travel to her health facility and the limited time she is able to speak with her physician.

Non-Resident Status

In spite of this negative clinic distance relationship, non-resident status was a positive predictor of satisfaction with accessibility in our findings. A majority of non-residents were from Samoa, a neighboring island with the same cultural and ethnic background. Because of its status with the United States, American Samoa may have been perceived by women as having considerably more resources for prenatal care than Samoa, which may explain non-resident's satisfaction with care.

Waiting Time

Waiting two hours or more was understandably a very strong predictor of less satisfaction with care Clinic Services, Accessibility, and Overall satisfaction. One woman shared, *"Doctors take forever to call the patient's names. Not enough doctors. They don't call you at the time that your appointment was set."* Several women echoed this sentiment in the patient feedback. On average, women waited 57 minutes (1 – 240 minutes) after check in to meet with the doctor, but only spent about 17 minutes speaking with the physician. A study based in West Virginia that used a different method of measuring satisfaction, found that women waiting 60 minutes or more had over seven times the odds of being dissatisfied than women that waited 0-13 minutes (Dye & Wojtowycz, 1999). A qualitative study in Ghana also found that waiting time was a significant barrier to care for many pregnant women (Ganle, Parker, Fitzpatrick, & Otupiri, 2014).

Employment Status

Women who were employed or on maternity leave were less satisfied with Physician Interactions than women who were unemployed or students. This relationship may be influenced by the time women wait in the waiting room before they are able to interact with their physician. Women who are working while pregnant may have significant time constraints that impact the quality of their visit. One women explained, "*They really need to open early cause some of us are late [to] work. And plus they need to put those patients that came in first instead of call in with their time on their appointment…"* An alternative explanation could be that these women are also more educated and perhaps expect a higher level of interaction/explanation of procedures from the doctors than they are able to provide within the constraints of short appointments.

Previous Pregnancy Loss

Pregnancy loss was a significant predictor of lower satisfaction with physician's interactions. Pregnancy loss has been demonstrated to have a profound impact on how the mother navigates and experiences health care (Gold, 2006). It is understandable that physicians may need to provide an additional level of support for these women, although the physicians are clearly limited for time and may need more training to do so. One study demonstrated that women who had a previous miscarriage had lower prenatal care utilization, with fewer prenatal care visits (Wehby, Murray, Castilla, Lopez-Camelo, & Ohsfeldt, 2009).

Appointment Attendance

The relationship between appointment attendance and satisfaction is potential evidence that those with lower satisfaction are less likely to attend all of their appointments, although it should be cautioned that these data are cross-sectional. Women may not have attended all of their appointments because they were dissatisfied. Several women shared that waiting room of the clinic was very uncomfortable and there were not enough chairs for women. However, women may not attend their appointments because they feel disconnected from the providers or may not believe in the importance of prenatal care (Simkhada et al., 2008).

Areas for Improvement

These findings are directly relevant to the operation of prenatal care centers and practice of nurses and physicians on the island. We have identified several critical targets of intervention that can be improved to improve patient satisfaction. For example, with regards to clinic distance, it may be advisable to design programs to make it easier for women to access their

clinic of choice on the island and improve the operations of currently established clinics. Another possibility is to develop a shuttle program that could be used to help women get to their appointments on time. This would improve patient satisfaction in all domains. Alternatively, clinic operating hours could be more flexible, perhaps opening early or late on one or two days each week to accommodate women who find it hard to attend during working hours.

These findings indicate that a fundamental shift in care delivery is needed to reduce waiting times and increase provider-patient interactions. Group prenatal care, which was developed as an alternative to the traditional prenatal care model, could serve well in this circumstance because it shifts prenatal care tasks from physicians to midwives or nurse-practitioners and effectively utilizes patient-provider time for delivery of focused prenatal care education. Prenatal care education is known to be lacking in this setting (Hawley et al., unpublished data), likely as a result of the short patient-physician interactions. Group prenatal care has been associated with improved satisfaction, utilization, and pregnancy outcomes in many other settings in the United States and even in places such as Iran (Ickovics et al., 2007; Jafari et al., 2010; Tilden, Hersh, Emeis, Weinstein, & Caughey, 2014).

There is also ample opportunity to increase the use of midwives on the island. Currently, there is a small population of midwives on the island that are licensed to provide care, although their ability to practice is limited. A core component of group prenatal care is having a provider focused exclusively on the birthing experience, and shifting to this model would require more support from the government to increase the training of midwives and provide opportunities for certification.

Limitations

There are several limitations to our findings. We used a standardized prenatal care questionnaire that has been validated in several populations (Raube et al., 1998), but not in our study population specifically. We expected to find similar satisfaction domains to Raube et al's initial study. However, instead of finding 7 dimensions, as they did, only 3 dimensions (or components) were extracted from our data. However, our components demonstrated high reliability and good construct validity. In addition, Raube et al, acknowledge in their study that the scale was designed to be used allowing for different dimension specifications. The satisfaction questionnaire has been used in a variety of populations and settings including: low income women in the United States (Raube et al., 1998), African American women in a managed care setting in the United States (Handler et al., 2003a), in Ethiopia (Chemir et al., 2014), and even in Iran (Jafari et al., 2010). Overall satisfaction ranged from 60.4 to 80.3 (Chemir et al., 2014; Handler et al., 2003a). Our overall satisfaction score of 68.4 fits well within this range.

Another limitation of the study was the use of self report questionnaires to collect the study data. Self report data often leads to significant variability and possibly introduces bias. An issue that arose due to self-report was a lack of detailed and validated information about pregnancy complications, which may have led to underreporting. Our cross-sectional study design makes it infeasible understand how past and subsequent pregnancies impact satisfaction over time. One variable that was significantly impacted by the self-report nature of the data was height, which made it impossible to calculate the BMI of study participants. While weight status has been associated with differential prenatal care utilization in other settings (Chu et al., 2008; Zozzaro-Smith et al., 2015) we suspect that this is unlikely to be an issue in American Samoa, as more than 90% of women are overweight or obese upon prenatal care enrollment, and there is little stigma attached to pregnancy body size in this setting (Sternberg Lamb, 2015).

Finally, our sample size was fairly small. However, in spite of this small sample size, our data were robust enough to complete PCA with high reliability and we were powered for the multivariable logistic regression models. Our study also included qualitative data which confirmed our interpretation of the quantitative data.

Future research should prospectively explore the impact of prenatal care satisfaction on utilization. It would be useful to examine prenatal care satisfaction over time, following mothers through subsequent pregnancies examine whether satisfaction in one pregnancy impacts the way they navigate future prenatal care.

Conclusion

Prenatal care satisfaction is an important determinant of prenatal care utilization. By identifying specific characteristics that predict lower satisfaction, we can guide providers and health services towards improved prenatal care delivery.

Tables

Table 1. Sample Characteristics

Characteristic (N=165)	N(%)[a]
Age (years, mean ± SD)	26.7 ± 6.0 (n = 165)
20 and younger	27 (16.4)
21-25	55 (33.3)
26-30	42 (25.5)
31-35	26 (15.8)
36 and older	15 (9.1)
Marital Status	
Never married/Separated/Divorced/Widowed	41 (25.0)
Married and Cohabitating	123 (75.0)
Resident Status	
Resident of American Samoa	129 (79.1)
Non-Resident[b]	34 (20.9)
Education Level (Highest Level Achieved)	
Secondary School or Less	74 (45.4)
Higher Education	89 (54.6)
Employment Status	
Unemployed/Student	97 (59.1)
Employed/Maternity Leave	67 (40.9)
Trimester at Time of Survey[c]	
First	18 (11.8)
Second	48 (31.6)
Third	86 (56.6)
Parity (Number of Births, mean ± SD)	2.7 ± 1.9
Nulliparous	48 (29.8)
1-2 Births	64 (39.8)
3-4 Births	35 (21.7)
5+ Births	14 (8.7)
Pregnancy Complications (Current Pregnancy)[d]	
Yes	18 (11.0)
No	146 (89.0)
Previous Pregnancy Loss[e]	
Yes	21 (17.8)
No	97 (82.2)
Pre-pregnancy Weight Tertile (lbs, mean ± SD)	
94-160 (137.4 ± 17.9)	56 (35.2)
161-208 (186.0 ± 13.0)	50 (31.4)
209-430 (242.0 ± 43.1)	53 (33.3)
Most Visited Clinic[f]	
LBJ	129 (81.6)
Other	29 (18.4)
Clinic Distance from Home Village (Driving	

Time)	
10 minutes or less	71 (43.6)
11-19 minutes	70 (42.9)
20 minutes or more	22 (13.5)
Health Insurance[c]	
Yes	25 (16.0)
No	131 (84.0)
WIC	
Yes (mother, children, and both)	149 (92.5)
No	12 (7.5)
Attended All Scheduled Appointments	
Yes	145 (90.6)
No	15 (9.4)
Average Time Spent at Clinic	
0-30 minutes	12 (7.3)
30 minutes-1 hour	50 (30.5)
1 hour-1 hour 30 minutes	24 (14.6)
1 hour 30 minutes-2 hours	25 (15.2)
More than 2 hours	53 (32.3)
Average Time Waiting to See Doctor (minutes, mean ± SD)	54.7 ± 51.4
Average Time Spent Talking to Doctor (minutes, mean ± SD)	17.8 ± 21.0

[a]Numbers may not sum to 165 due to missing data, and percentages may not sum to 100% due to rounding.

[b]Non-residents included residents from Western Samoa.

[c]Variables have greater than 5% missing: Trimester, 13 missing values and Health Insurance, 9 missing values.

[d]More information about specific pregnancy complications was not asked during the survey.

[e]Only includes women who have had a previous pregnancy.

[f]Other clinics included: Leone Health Clinic, Tafuna Health Care Center, Amouli Health Clinic.

Table 2. Dimensions of Prenatal Care Satisfaction from Principal Component Analysis

Components	Construct Measured	Component Loading[a]
Clinic Services	How would you rate the *availability of nutritional services* (people who can talk to you about what to eat during pregnancy)?	0.859
	How would you rate the *respect* shown to you by the *nurses or receptionists*?	0.824
	How would you rate the *comfort* shown to you by the *nurses or receptionists*?	0.780
	How would you rate the *explanation of procedures*?	0.770
	How would you rate the *helpfulness of advice* you have received from the prenatal clinic during your pregnancy?	0.768
	How would you rate the *thoroughness of your examinations*?	0.768
	How would you rate the *explanation of your lab results*?	0.760
	How would you rate the *concern* shown to you by the *nurses or receptionists*?	0.739
	How would you rate the *availability* of *doctors*?	0.721
	How would you rate the *cleanliness* of the *clinic*?	0.709
	How would you rate the *atmosphere* of the *waiting room*?	0.639
	How would you rate the *comfort* of the *waiting room*?	0.610
Accessibility	How would you rate the *waiting time to get an appointment* (between the time you call and come in)?	0.745
	How would you rate the *length of time you wait* to see your doctor when you have an appointment?	0.697
	How would you rate *the waiting time to get an appointment* (between the time you call and come in)?	0.670
	How would you rate the *location* of the *clinic*?	0.638
Physician Interactions	How would you rate the *comfort* shown to you by the *doctors*?	0.900
	How would you rate the *respect* shown to you by the *doctors*?	0.876
	How would you rate the *concern* shown to you by the *doctors*?	0.847
	How would you rate the *technical skills* shown to you by the *doctors*?	0.745
	How would you rate the *modernness* of the *medical equipment in the clinic*?	0.399

[a]Loadings were extracted using pattern matrix from oblique rotation.

Table 3. Dimensions of Satisfaction: Reliability and Univariate Statistics

Scale	Number of Questions	Normalized Mean	Normalized Standard Deviation	Normalized Range	Standardized Cronbach's Alpha
Overall satisfaction	21	68.36	21.90	20-100	0.969
Clinic Services	12	68.00	23.89	20-100	0.962
Accessibility	4	58.54	19.77	20-100	0.892
Physician Interactions	5	76.38	20.21	20-100	0.925

Table 4. Unadjusted Associations Between Maternal Characteristics and Satisfaction Score[a]

Characteristic (Total n=165)	Satisfaction Components (mean score, points)							
	Clinic Services	p	Accessibility	p	Physician Interactions	p	Overall	p
Age		.090		.109		.175		.109
20 and younger	67.0		56.0		76.9		67.8	
21-25	68.1		58.8		75.9		68.1	
26-30	75.0		64.0		74.3		74.3	
31-35	61.3		48.8		68.6		60.7	
36 and older	62.0		63.7		78.0		66.9	
Marital Status		.924		.823		.781		.895
Never married/Separated/Divorced/Widowed	68.0		59.4		75.8		68.9	
Married and Cohabitating	68.2		58.5		76.8		68.4	
Clinic Distance		**.019**		**.001**		**.001**		**.002**
10 minutes or less	72.4		65.3		81.4		73.5	
11-19 minutes	65.6		54.6		74.3		65.6	
20 minutes or more	59.0		46.4		64.9		58.1	
Resident Status		.627		**.004**		.087		.190
Resident of American Samoa	67.5		55.7		74.9		67.2	
Non-Resident	69.6		68.6		81.4		72.3	
Education Level		.832		.891				.682
Secondary School or Less	68.0		58.5		77.0		68.8	
Higher Education	67.3		58.0		75.3		67.4	
Employment Status		**.040**		.106		**.030**		**.034**
Unemployed/Student	70.7		60.8		79.0		70.9	
Employed/Maternity Leave	63.7		54.7		72.3		64.2	
Parity		.799		.417		.819		.858
Nulliparous	68.0		58.5		77.2		68.4	

1-2 Births	69.1	55.7	77.7	68.6
3-4 Births	69.3	64.2	75.9	69.9
5+ Births	62.9	58.6	72.3	64.3
Pre-pregnancy Weight (lbs)	.835	.465	.633	.761
94-160	66.1	55.9	73.6	66.1
161-208	68.6	60.6	76.6	69.0
209-430	66.7	55.5	76.8	67.3
Most Visited Clinic	.382	.904	.414	.479
LBJ	68.5	58.0	77.0	68.5
Other	64.4	58.6	73.7	65.6
Trimester at Time of Survey	.581	.609	.355	.517
First	71.5	63.0	81.1	72.2
Second	65.2	57.0	73.4	65.8
Third	67.1	57.3	76.0	67.6
Pregnancy Complications	.571	.881	.711	.796
Yes	70.8	59.4	74.9	69.6
No	67.7	58.5	76.7	68.3
Most Visited Clinic	.417	.916	.447	.479
LBJ	68.2	58.1	76.8	68.5
Other	64.5	58.6	73.7	65.6
First Pregnancy	.801	.841	.277	.694
Yes	69.2	58.3	79.2	69.7
No	68.2	59.1	75.6	68.4
Previous Pregnancy Loss	.504	.988	.083	.409
Yes	65.2	58.3	69.3	64.9
No	68.7	58.2	77.8	68.9
Health Insurance	.252	.972	.412	.387
Yes	72.5	58.7	79.1	71.5
No	67.0	58.8	75.6	67.7
WIC Status	.233	.087	.960	.262
Yes (mother, children, and both)	67.3	57.7	76.4	67.7
No	75.1	70.0	76.7	74.5
Attended All Scheduled Appointments	.072	.312	.277	.103
Yes	68.8	58.9	76.8	69.0
No	58.1	52.3	70.9	60.0
Average Waiting Time at Clinic	**<.001**	**<.001**	.124	**<.001**
0-30 min	79.0	75.4	85.0	79.8
30 min – 1 hour	76.0	67.1	79.8	75.3
1 hour – 1 hour 30 min	72.2	62.6	77.2	72.1
1 hour 30 min- 2 hours	66.0	56.2	74.1	66.1
More than 2 hours	56.9	45.5	71.7	58.3

[a]Bold indicates significant results with p <0.05. Binomial variables were analyzed using two-sided independent t test. Categorical variables were analyzed using one-way ANOVA.

Table 5. Pearson Correlation for Time Spent Talking with Doctor Versus Satisfaction Across Components[a]

		Question: Time Spent Talking with Doctor	Clinic Services	Accessibility	Physician Interactions	Overall
On average, how many minutes do you spend talking with the doctor/being examined?	Pearson Correlation	1	.218	.152	.189	.214
	P-value (2-tailed)		**.006**	.056	**.017**	**.007**
	N		160	157	159	159	156

[a]Bold indicates significance

Table 6. Adjusted Associations of Maternal Characteristics with Satisfaction Components[a]

	Clinic Services Adj R^2=0.1850			Accessibility Adj R^2= 0.2361			Physician Interactions Adj R^2=0.0986			Overall Satisfaction Adj R^2= 0.1572		
Variable	B	SE	p	B	SE	p	B	SE	p	B	SE	p
Age												
20 or younger	-9.40396	5.99724	0.119	-8.33060	6.33384	0.191	-0.43761	7.98824	0.956	-8.53231	5.53235	0.125
21-25	-9.10289	4.72422	0.056	-3.04589	4.95563	0.540	-8.86378	5.14518	0.088	-6.98299	4.35831	0.111
26-30 (ref)												
31-35	-6.28373	5.58125	0.262	-7.56109	5.86687	0.200	-9.95542	5.59108	0.078	-7.10237	5.15270	0.170
36 or older	-8.74437	6.83902	0.203	0.20974	6.71018	0.975	-4.68598	6.72845	0.488	-5.51419	5.89908	0.352
Parity												
Nulliparous (ref)												
1-2 Births	-1.77266	5.32766	0.677	-4.49418	4.49395	0.319	-0.56249	8.15061	0.945	-1.93260	3.91462	0.622
3-4 Births	-1.08831	5.96964	0.838	2.59084	5.51075	0.639	0.95219	8.50823	0.911	-1.65272	4.82815	0.733
5+ Births	-6.76066	6.95601	0.333	1.85280	7.30994	0.800	-0.56946	9.44539	0.952	-4.02298	6.40439	0.531
Resident Status												
Resident (ref)												
Non-Resident	-1.00990	4.17994	0.810	11.74176	4.44508	**0.009**	5.98992	4.78981	0.214	1.90979	3.82983	0.619
Employment Status												
Unemployed/Student (ref)												
Employed/Maternity Leave	-6.90002	3.59143	0.057	-2.75724	3.78233	0.467	-9.15977	4.16063	**0.030**	-5.62443	3.33048	0.094

	B	SE	p	B	SE	p	B	SE	p	B	SE	p
Clinic Distance												
Less than 10 Min (ref)												
11-19 Min	-0.96484	3.69615	0.795	-5.15256	3.84850	0.183	-0.28625	4.20221	0.946	-3.58377	3.34272	0.286
More than 20 Min	-8.12880	5.13119	0.116	-13.70616	5.42688	**0.013**	-14.73739	6.14713	**0.018**	-11.30332	4.77532	**0.019**
Average Waiting Time												
Less than 30 min (ref)												
30 min to 1 hour	-2.28433	7.37737	0.757	-1.09980	7.78639	0.888				0.87351	6.59183	0.895
1 hour to 1 hour 30 min	-5.17771	8.05954	0.522	-2.13485	8.58473	0.804				-1.10167	7.33320	0.881
1 hour 30 min to 2 hours	-12.70349	8.12491	0.120	-9.67391	8.57219	0.261				-8.07130	7.31468	0.272
2 hours or more	-20.34861	7.45935	**0.007**	-19.75208	7.93513	**0.014**				-14.73521	6.71967	**0.030**
Attended All Appointments												
Yes (ref)												
No	-15.96798	6.50867	**0.015**									
WIC Status												
Yes (ref)												
No				-10.63454	6.46974	0.103						
Pregnancy Loss												
Yes							-11.17837	5.26821	**0.036**			
No (ref)												

[a]Bold indicates significance

Table 7. Examples of Statements about Prenatal Care

Participant ID	
111	I know the nurses' job and especially the doctor's job is not an easy task. They try their very best to assist pregnant mothers. A job well done to them and do continue your usual jobs. Also allow sufficient time for prenatal care visits. Thank you!
174	The prenatal care program has been played an important role in my life as well as other pregnant women. Keep up the good job.
233	Prenatal clinic staff is very helpful and polite. I love the nurses. Always kind. My current doc didn't tell me about many of the things asked in this survey. Equipment needs upgrade and waiting room needs to be expanded. Doctors need to be more involved in a sense and more inclined to ask and test when needed. Also need psychological clinic for pregnant women…
213	My main concern would be the availability of doctors and waiting area. The waiting area needs more room and space.
147	I think that the nurses are very kind. My only problem is the waiting area, the waiting time to see the doctors. I am aware that they have to run errands but when setting an appointment, they should try to stick with the apt. as much as possible. I feel that regardless of how many patients are waiting to see the doctor, they should try to at least accommodate you and everything you ask. I had an experience with one of the doctors that he was rushing me with all the questions I had. I do think that the prenatal program is great and they do take care of us as far as allowing us to be seen for free. Not a lot of hospitals give those services.
257	Prenatal care is on the average basis. Some receptionists/nurses are caring and comforting, while some are not. We need more doctors and a bigger more comfortable clinic. We need nutritionists at least at our 1st or 2nd visits to talk about nutritional eating or pregnancy diet. Nonetheless, we need a new ultrasound scanner. :)
292	The service is good but the time, the patient wait is so long. Appointment should be on time, as we have things to do. Time is important not really in prenatal but in every section in this hospital.
229	The major issue I have with the clinic is the amount of time it takes to see the Doctor. It takes 2 to 3 hours to see a Doctor, regardless of the time of your appointment. If this can be addressed and new procedures for check in are made, I would be happy with the service.
218	The service provided by the doctors and nurses at the clinic is outstanding but the only problem is that the clinic is too small and the waiting room does not have enough space for all pregnant women coming to the clinic for their prenatal visits.
101	It'll be nice if we are provided with information on prenatal clinics and pregnancy especially some women are new at it. Although this is my second baby there are still more information I would like to know in order for me to be prepared for my future pregnancies such as weight loss/gain before, during, and after pregnancy.

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