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Author manuscript

Am J Obstet Gynecol. Author manuscript; available in PMC 2018 February 01.

Published in final edited form as:

Am J Obstet Gynecol. 2017 February ; 216(2): 181.e1–181.e7. doi:10.1016/j.ajog.2016.10.013.

Non-Urgent and Urgent Emergency Department Use During Pregnancy: An Observational Study

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Abstract

Background—Emergency department use is common among pregnant women. Non-urgent emergency department use may represent care that would be better provided by an established obstetric provider in an ambulatory setting.

Objective—To identify socio-demographic factors associated with non-urgent emergency department use in pregnancy.

Study Design—This is a cross-sectional study of women recruited during their postpartum hospitalization. Data regarding prenatal care and emergency department visits was collected from medical records; participants completed a survey with questions regarding demographics and emergency department use. Urgency of an emergency department visit was pre-specified based on a-priori criteria abstracted from medical record review. Women with any non-urgent emergency department use were compared with women without non-urgent emergency department use. Logistic regression was performed to identify factors associated with non-urgent emergency department use.

Results—Two hundred and thirty-three women participated in this study; 197 (84%) received care in the emergency department during pregnancy. Eighty-three (35.6%) women had at least one visit to the emergency department that was non-urgent. In regression analysis, increased odds of non-urgent emergency department use was associated with a preferred language other than English (OR 2.02, 95% CI 1.01-4.05) and lack of private insurance (OR 5.55, 95% CI 2.54-12.12). The

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The other authors have no conflict of interest.

Data from this study was presented at the 2014 ACOG Annual Clinical Meeting, American College of Obstetrics and Gynecology, Chicago, Illinois, April 26 – 30, 2014.

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two most common reasons for presentation to the emergency department were concern that there was an emergency (45%) or being referred by a healthcare provider (36%).

Conclusion—Women frequently use the emergency department during pregnancy, including visits for non-urgent indications. Identifying risk factors for non-urgent emergency department use in pregnancy is important for identifying women likely to use the emergency department, including for non-urgent visits, and the development of strategies to decrease non-urgent emergency department utilization in pregnancy.

Keywords

Emergency department; Non-urgent emergency department use; Pregnancy; Prenatal care

Introduction

Emergency departments (EDs) nationwide are being increasingly utilized for non-emergent medical care.¹ Although many patients seeking medical care in the ED need urgent or emergent medical care, up to one-third of patients seen in the ED have “non-urgent” problems that could have potentially been addressed in an outpatient setting.² For chronic illnesses and conditions, continuity of care with an outpatient provider leads to less costly and higher quality care for the patient.³⁻⁵ Non-urgent care received through the ED is usually not in the best interest of the patient or the health care system.

ED utilization among pregnant women is common despite the fact that pregnant women are generally regarded as having access to insurance and regularly scheduled medical care at outpatient prenatal visits. A national cohort study found that pregnancy-related problems were the fifth most common reason for presentation to the ED and the fourth most common ED discharge diagnosis in women aged 15 – 65 years old.⁶ Among a smaller cohort of pregnant women, 50% accessed the ED for care during their pregnancy.⁷ Despite this use, details on utilization of ED care among pregnant women are limited.

Although many pregnant women may have an urgent or emergent medical problem that requires prompt ED evaluation, others likely choose to use the ED for non-urgent reasons. Non-urgent issues may be better addressed by the patient's usual prenatal care provider in an outpatient setting rather than in the ED. Understanding factors associated with urgent and non-urgent ED visits during pregnancy could assist in the identification of women at risk of using the ED for non-urgent indications and aid in the development of strategies to prevent identified women from seeking non-urgent care from an ED, optimizing both ED and prenatal care. The objective of this study was to identify socio-demographic characteristics associated with urgent and non-urgent ED use in a population of pregnant women.

Materials and Methods

This was a cross-sectional study of postpartum women who delivered in July and August 2012 at Women & Infants Hospital (WIH) in Providence, RI. WIH is a free-standing women's hospital with an associated women's ED, specializing in the evaluation of acute obstetric and gynecologic issues. Labor and delivery triage is located and managed within

this ED unit. All women who delivered at WIH during the study period were screened for eligibility. Women were eligible for inclusion if they (1) were greater than 18 years old at the time of delivery, (2) spoke English or Spanish, (3) were available in their hospital room for eligibility screening, (4) were willing to participate and (5) were able to give informed consent. Women were excluded if they delivered a stillborn or pre-viable fetus or if they obtained prenatal care from a solo-practitioner, a maternal-fetal medicine subspecialist, or an obstetrician who was not affiliated with WIH. Women determined to be eligible by medical record pre-screen were approached on post-partum day #1 or post-operative day #2. Trained study staff performed a second screen to determine final eligibility and offer participation to eligible women. Informed consent was signed by all participants. The WIH IRB approved the study, IRB# 12-0029.

Study staff reviewed the medical record of participants and collected specific data about WIH ED visits during pregnancy. An “urgent” visit was defined as meeting any of the following criteria: 1) hospital admission or transfer to another facility 2) greater than 1 liter of intravenous (IV) fluids received, 3) IV medications received, 4) documentation that the participant was sent to the ED by a provider or other facility, or 5) the chief complaint was a sign of a pregnancy complication or labor. The Emergency Severity Index assigned was collected but not used in our categorization of urgency. Signs of a pregnancy complication or labor included vaginal bleeding in the 2nd or 3rd trimester, leaking fluid, regular frequent painful contractions (defined as every 5 minutes) or decreased fetal movement at greater than 20 weeks gestational age. Ultimately, we were not able to reliably determine from the record if an ED visit was prompted by provider referral, therefore this criterion was not used to determine of urgency of the visit. Based on these criteria participants were categorized into two groups: women with any non-urgent ED use during pregnancy and women “without non-urgent ED use,” defined as no ED use or urgent ED use only.

Information about maternal demographics and prenatal care was also collected from the medical record. Socio-demographic and clinical data collected included maternal age, parity, insurance type (none, public or private), provider type (private practice versus community based which included hospital based clinics and community health centers), number of prenatal visits, missed appointments, antepartum complications, mode of delivery, use of ancillary services during pregnancy and laboratory testing. Adequacy of prenatal care was determined using the Adequacy of Prenatal Care Utilization Index (APNCU), which combines gestational age at time of initiation of prenatal care with the proportion of prenatal visits attended to calculate “adequacy” of prenatal care.⁸ Prenatal care was categorized as “inadequate” if initiation occurred after 14 weeks gestational age and/or the participant attended fewer than 50% of expected visits. All other categories required prenatal care initiation prior to 14 weeks gestational age and were assigned based on attendance at expected prenatal care visits with categorization of intermediate, adequate or adequate-plus prenatal care pertaining to attendance at 50-79%, 80-109% or 110% of expected visits, respectively.⁸

At the time of enrollment, participants completed a health and demographic questionnaire constructed by study investigators. The questionnaire included 40 questions regarding medical history, prenatal care, and demographic characteristics including race, educational

level completed, socioeconomic status, living situation, and social supports. Language preference was defined by the following survey question: “What language do you use the most (with family and friends)?” Participants were also asked whether or not they used the ED during pregnancy. If they reported ED use, they were asked to recall details about a maximum of three ED visits, including symptoms that prompted them to present to the ED, why they chose the ED for their care, whether or not they called their provider prior to presenting to the ED, how they got to the ED, and who they presented to the ED with. Participant self-reported details about ED use during pregnancy were not linked to specific ED episode data collected through retrospective chart review.

Lastly, participants were also administered the Test of Functional Health Literacy – Short Version (S-TOFHLA).⁹ This is a self-administered questionnaire validated in both English and Spanish for assessment of health literacy. Similar to other studies, we combined “marginal” and “inadequate” scores to represent “limited” health literacy.⁹ Limited health literacy suggests an inability to read and interpret health related information.

Data were analyzed using SAS 9.3 (SAS Institute, Cary, NC). Categorical variables were analyzed using chi-square or Fisher's exact test and continuous variables were analyzed using t-test and Wilcoxon rank sum tests. Women categorized as “without” non-urgent ED use were compared with those with any non-urgent ED visits. Logistic regression was performed to estimate the association between selected demographic characteristics and non-urgent ED use during pregnancy. All demographic characteristics that were associated in bivariate analyses ($p < 0.05$) with non-urgent ED use during pregnancy were considered for incorporation in a full model. To ensure a sufficient number of outcomes per covariate (10 or more), the number of predictor variables was reduced by removing variables highly correlated with other covariates. When a strong association (phi coefficient or Cramer's V 0.4) between potential covariates was identified (such as insurance and provider status), we selected the variable more strongly associated with the outcome in the unadjusted models. We used the final full model to estimate odds ratios and 95% confidence intervals. Model fit was assessed by the c-statistic and Hosmer-Lemeshow goodness-of-fit test.

Results

Between July and August 2012, 552 postpartum women were screened for eligibility. One hundred and seventy-one women were ineligible or unavailable at the time of recruitment. Of the 381 eligible women, 251 (65.9%) women agreed to participate in the study and 233 women completed the health literacy screen and questionnaire (see Figure 1). Of the women who completed participation, 197 (84.5%) used the ED during pregnancy for a total of 498 ED visits. Thirty-six women (15.5%) had no recorded ED use and 83 women (35.6%) had at least one ED visit that was categorized as non-urgent.

Several differences were noted between women with any non-urgent ED visits and women without non-urgent ED visits (Table 1). Compared to women without non-urgent ED visits, women with any non-urgent ED visits were younger (26 versus 31 years, $p < 0.001$), more likely to identify as Hispanic (49.4 versus 18.7%), to have public insurance (86.7 versus 41.3%, $p < 0.001$), to make less than \$20,000 per year (51.8 versus 27.3%, $p < 0.001$), to be

single (19.3 versus 6.7%, $p = 0.003$) and to have a community based OBGYN provider (38.6 versus 20.8%, $p = 0.004$). Women with any non-urgent ED use were also less likely to be Caucasian (36.1 versus 64.0%), to speak only English at home (57.8 versus 83.3%, $p < 0.001$), and to have completed education beyond high school (39.8 versus 72%, $p < 0.001$). The observed difference in health literacy was not statistically significant.

More women with non-urgent ED visits reported unplanned pregnancy compared with women without non-urgent ED use (47.0 versus 32.0%, $p = 0.024$) (Table 2). Timing of initiation of prenatal care was similar in both groups with the majority of women (82.5%) seeking care before the 2nd trimester of pregnancy. Women with any non-urgent ED use were more likely than women without non-urgent ED use to have missed a prenatal care visit (32.5% versus 15.0%, $p = 0.002$). Using the APNCU, we found that the proportion of women with inadequate or indeterminate prenatal care was similar among women with and without non-urgent ED use during their pregnancy; however a larger proportion of women who had non-urgent ED use had adequate-plus prenatal care (30.7%) compared with those without non-urgent ED use (13.9%) ($p = 0.019$).

Most women (85.8%) reported receiving both verbal and written information about what to expect during pregnancy, including signs and symptoms that should prompt seeking care in the ED. Although we found no difference in type of ED use between women who reported receiving and not receiving this information, only 9 women (3.9%) accurately identified the signs of labor or pregnancy complications. More women with any non-urgent ED use were able to identify these signs compared to women without non-urgent ED use (9.6 versus 0.7%, $p = 0.001$). Almost 90% of women in both groups reported that they would ask their obstetrical provider if they had a question during their pregnancy.

Language preference and insurance type remained significantly associated with type of ED use when controlling for age, language, education, relationship status, insurance type and whether or not this was a planned pregnancy (Table 3). Women who spoke a language other than English with friends and family had two times greater odds of using the ED for non-urgent indications (OR 2.02, CI 1.01 – 4.05) compared with women who spoke only English. Individuals with public or no insurance, as compared with private insurance, also had greater odds of using the ED for non-urgent indications (OR 5.55, CI 2.54 – 12.12).

Self-reported reasons for accessing the ED for care were similar between the two groups. While not mutually exclusive, for 45% of self-reported ED visits women reported they had presented to the ED because they felt they were experiencing a medical emergency and for 36% of visits they reported they were instructed by their healthcare provider to present to the ED for medical care. For 13% of reported visits participants reported difficulty accessing a primary obstetric provider.

Comment

This study supports previous findings suggesting that ED use in pregnancy is common. The majority of women enrolled in our study used the ED during their pregnancy and more than one-third of these visits to the ED were for non-urgent indications. We found several socio-

demographic factors that were associated with non-urgent ED use in pregnancy, however after controlling for potential confounding factors, a preferred language other than English and public or no insurance were the only two factors that remained significantly associated with non-urgent ED use in pregnancy. Women frequently cited accessing the ED because they perceived they were experiencing an emergency. While women with non-urgent visits were more likely to have an unplanned pregnancy or to have missed a prenatal care visit, overall prenatal care attendance among the majority of participants was determined to be adequate or better than adequate.

Forty-five percent of the time that women reported accessing the ED, they did so because they felt as if they were experiencing an emergency. This is similar to a prior study, where 37% of women presented to an obstetrics and gynecology ED because they felt that they were having a true emergency.¹⁰ In this same study, only 7% of those patients who presented to the ED because of a perceived emergency were admitted.¹⁰ And in a study of pregnant women, 60% of visits to labor and delivery triage resulted in discharge to home without hospital admission, suggesting a possible non-urgent visit.⁷ High “symptom distress,” or the “degree of discomfort from the specific symptom as reported by the patient,”¹¹ in pregnancy has been associated with increased odds of utilizing care outside of scheduled prenatal care, including visits to a labor and delivery triage unit or an ED.⁷ Patients may be attributing an elevated degree of urgency or emergency to their symptoms prompting ED use. Patient perception of urgency is an important factor that drives healthcare seeking behavior and warrants further investigation in the context of pregnancy.

Socio-demographic factors have been suggested to influence non-urgent ED use in the general population,² however studies on this relationship have been inconclusive.^{2,12} In addition, general population studies may not be generalizable to pregnant women given low-risk pregnant women, in general, are much younger with fewer comorbid conditions than individuals who receive care in a general ED. In our study, maternal characteristics such as age, language spoken at home, education level achieved, relationship status, and insurance type as well as reporting a planned pregnancy, were associated with non-urgent ED use, but these associations were not statistically significant when multiple factors were adjusted for. This may be due to the interrelatedness of socio-demographic factors, or it may be that socio-demographic factors cannot be reliably used to predict non-urgent ED use. It is possible that health literacy may be a link between these socio-demographic factors and non-urgent ED use in pregnancy.

Health literacy has been shown to be linked with increased ED use in the general population.¹³ Because the majority of women participating in this study had adequate health literacy we were not able to determine the associations between socio-demographic factors, health literacy, and non-urgent ED use. We anticipated much higher prevalence of inadequate health literacy and question whether our measure, the validated S-TOFHLA, was the most appropriate measure in such a young population.^{9,17} Future studies on ED use during pregnancy should include measures of health literacy more appropriate for younger populations, as it could be a modifiable risk factor if it is shown to be associated with non-urgent ED use.

Using a cross-sectional study design with primary data collection from participants helped us explore patient-level factors and perceptions that could be associated with ED use. Participant responses, however, were not linked to specific ED visits and participant perception was not included in the characterization of visits as urgent or non-urgent. We did not seek to find ED visits that occurred outside of the WIH ED given logistical constraints. Additionally, some ED visits may have been mischaracterized as urgent or non-urgent despite having a standardized list of criteria for determining urgency. Lastly, *underuse* of EDs is of equal importance and deserves further investigation before definitive conclusions about ED use can be drawn.

The overall percentage of women using the ED in our study was high. This may be due to the fact that the WIH ED provides both emergency care as well as labor and delivery triage. We did not differentiate between a visit to the WIH ED for a non-obstetrical complaint versus a complaint that would have been evaluated in an obstetrical triage unit. We believe that any evaluation in an acute setting, whether it occurs in an ED or an L&D triage, represents use of resources outside of standard prenatal care and, if non-urgent, could have been evaluated in an obstetrical provider's office.

Our exclusion criteria limit the generalizability of our results. We intentionally excluded women who received care on our high-risk pregnancy services, as it was our intent to focus on women who received care from generalist obstetricians and gynecologists. We also excluded patients of solo-practitioners because the goal was to include patients who receive care in a group practice setting. In order to ensure that we missed as few ED visits as possible, patients of obstetric providers practicing outside of WIH were excluded. While only a small percentage of women approached identified a language other than English or Spanish as their preferred language, these language restrictions limited the diversity of our sample. Lastly, several eligible women declined participation, thus we are unable to determine if this is a complete representation of ED use among eligible low risk obstetric women at this site.

Pregnant women are frequent users of the emergency department. In our sample of postpartum women, a preferred language other than English and lack of private insurance were associated with non-urgent ED use during pregnancy. Identifying women at risk for presenting to an ED for non-urgent indications during pregnancy is important to help to prevent non-urgent ED care and will help to target interventions to prevent non-urgent ED use. Health literacy should be further evaluated as a factor between these socio-demographic characteristics and non-urgent ED use. Additional research is needed to better understand non-urgent ED use in pregnant women and to strategize alternative and more appropriate resources for outpatient care.

Acknowledgments

The authors would like to acknowledge Yesenia Sanchez and Liliana Tavaréz, study staff who were involved in recruiting research participants and data collection.

Yesenia Sanchez, current Brown University medical student.

Liliana Tavaréz, RN currently employed by Care New England/Women and Infants Hospital.

Neither research assistant was compensated for their assistance with this project and there was no funding source. Both have given their consent to acknowledgement in this manuscript.

Disclosure: Dr. Kilfoyle's spouse was employed by Tedor Pharmaceuticals at the time that this research was conducted and at GlaxoSmithKline at the time that this manuscript was written.

Financial Support: Dr. Kilfoyle was supported by an institutional NIH training grant (T32 HD040672-15) during the time period this manuscript was written. She was not supported by this grant at the time the research was conducted.

This study was not registered.

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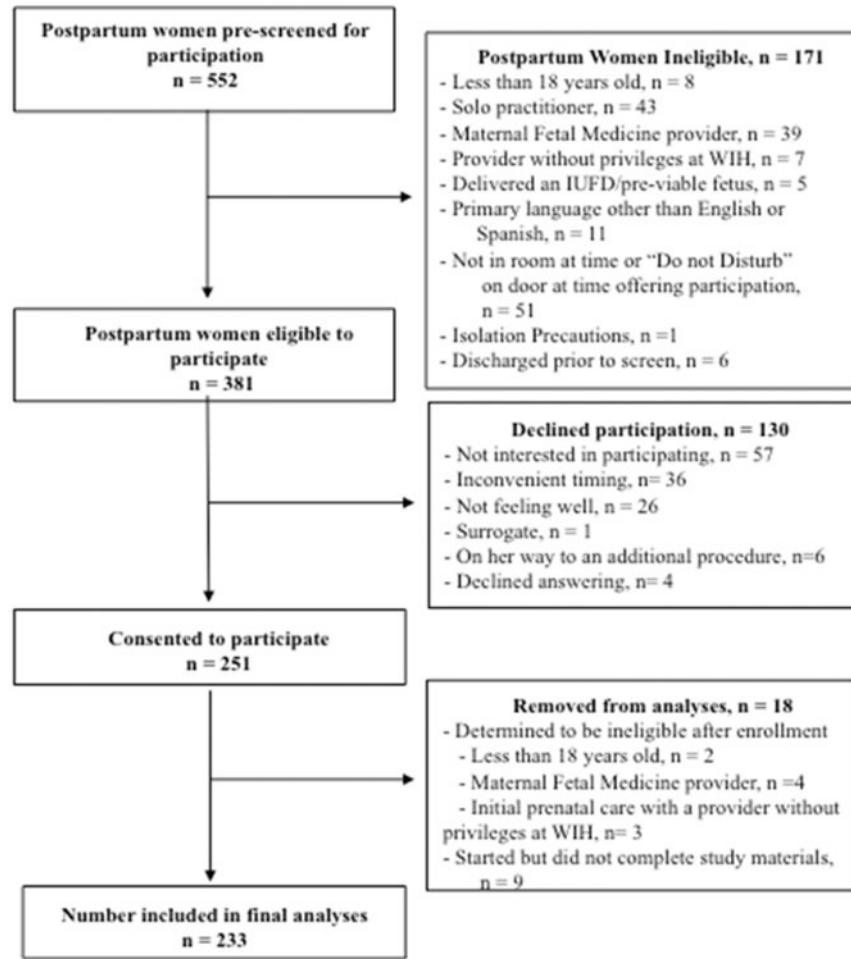


Figure 1. Flowchart with details of screening, exclusion and enrollment of women delivering at Women and Infants Hospital from July – August 2012. This figure outlines the screening, recruitment, and enrollment process for this study.

Table 1

Demographic characteristics of participants according to emergency department use while pregnant.

| Variable | Total* | Any non-urgent ED use* | Without non-urgent ED use* | P-value |
|---|--------------------|------------------------|----------------------------|---------|
| Total, n (row %) | 233 | 83 (35.6) | 150 (64.4) | |
| Age, Median (range) | 29 (18 – 44) | 26 (18 – 42) | 31 (18 – 44) | <0.001 |
| Parity (N, %) | | | | |
| Primiparous | 96 (41.2) | 30 (36.1) | 66 (44.0) | 0.243 |
| Multiparous | 137 (58.8) | 53 (63.9) | 84 (56.0) | |
| GA at delivery | | | | |
| Median (Range) | 39.0 (26.0 – 41.0) | 39.0 (26.0 – 41.0) | 39.0 (33.0 – 41.0) | 0.013 |
| [IQR] | [38.0-40.0] | [38.0-39.0] | [39.0-40.0] | |
| Race (N,%)[†] | | | | |
| Black or African American | 14 (6.0) | 4 (4.8) | 10 (6.7) | <0.001 |
| Hispanic | 69 (29.6) | 41 (49.4) | 28 (18.7) | |
| Caucasian, non Hispanic | 126 (54.1) | 30 (36.1) | 96 (64.0) | |
| Other (including no selection) | 24 (10.3) | 8 (9.6) | 16 (10.7) | |
| Language used at home (N,%)[†] | | | | |
| English | 173 (74.2) | 48 (57.8) | 125 (83.3) | <0.001 |
| Spanish | 43 (18.5) | 28 (33.7) | 15 (10.0) | |
| Both | 14 (6.0) | 6 (7.2) | 8 (5.3) | |
| Other | 3 (1.3) | 1 (1.2) | 2 (1.3) | |
| Insurance (N, %) | | | | |
| None/Public | 134 (57.5) | 72 (86.7) | 62 (41.3) | <0.001 |
| Private | 99 (42.5) | 11 (13.3) | 88 (58.7) | |
| Provider (N,%) | | | | |
| Community | 63 (27.2) | 32 (38.6) | 31 (20.8) | 0.004 |
| Private (all others) | 169 (72.8) | 51 (61.4) | 118 (79.2) | |
| Education level (N,%)[†] | | | | |
| Up to and including completion of high school or GED [‡] program | 92 (39.5) | 50 (60.2) | 42 (28.0) | <0.001 |
| Any education after high school | 141 (60.5) | 33 (39.8) | 108 (72.0) | |
| Health Literacy (N, %) | | | | |
| Marginal/Inadequate | 12 (5.2) | 7 (8.5) | 5 (3.3) | 0.120 |
| Adequate | 220 (94.8) | 75 (91.5) | 145 (96.7) | |
| Relationship status (N,%)[†] | | | | |
| Partnered | 207 (88.8) | 67 (80.7) | 140 (93.3) | 0.003 |

| Variable | Total* | Any non-urgent ED use* | Without non-urgent ED use* | P-value |
|--|------------|------------------------|----------------------------|---------|
| Single/Divorced/Separated | 26 (11.2) | 16 (19.3) | 10 (6.7) | |
| Annual Income (N,%)[†] | | | | |
| Unemployed or < \$20,000 | 84 (36.1) | 43 (51.8) | 41 (27.3) | <0.001 |
| \$20,000 or above | 127 (54.5) | 28 (33.7) | 99 (66.0) | |
| No answer | 22 (9.4) | 12 (14.5) | 10 (6.7) | |

* May not equal the total due to missing data

[†] By self report

[‡] General Equivalency Diploma

Chi-square or Fisher's exact test and t-test or Wilcoxon rank sum tests were used for categorical variables and continuous variables, respectively

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Table 2
Summary of quality and characteristics of prenatal care according to use of the emergency department while pregnant

| Variable | Total* | Any non-urgent ED use* | Without non-urgent ED use* | P-value |
|---|------------|------------------------|----------------------------|---------|
| Total, n (row %) | 233 | 83 (35.6) | 150 (64.4) | |
| Report planned pregnancy | 146 (62.3) | 44 (53.0) | 102 (68.0) | 0.024 |
| < 14 weeks gestational age at initiation of prenatal care | 188 (82.5) | 66 (80.5) | 122 (83.6) | 0.558 |
| Missed Prenatal Care Visits | 49 (21.3) | 27 (32.5) | 22 (15.0) | 0.002 |
| Final Sum of the Adequacy of Prenatal Care Utilization Index | | | | |
| Inadequate | 20 (10.2) | 8 (10.7) | 12 (9.8) | 0.019 |
| Intermediate | 23 (11.7) | 10 (13.3) | 13 (10.7) | |
| Adequate | 114 (57.9) | 34 (45.3) | 80 (65.6) | |
| Adequate plus | 40 (20.3) | 23 (30.7) | 17 (13.9) | |

* May not equal the total due to missing data

Chi-square or Fisher's exact test were used

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Table 3

Analysis of socio-demographic factors associated with non-urgent emergency department use.

| Variable | Unadjusted | | Mutually adjusted | |
|---|-------------------|---------|-------------------|---------|
| | OR (95% CI) | P-value | OR (95% CI) | P-value |
| Age, per year | 0.91 (0.87-0.95) | <0.001 | 0.98 (0.93-1.04) | 0.527 |
| Language spoken at home | | | | |
| English | 1.00 | Ref. | 1.00 | Ref. |
| Spanish/Both/Other | 3.65 (1.98-6.72) | <0.001 | 2.02 (1.01-4.05) | 0.047 |
| Education level completed | | | | |
| Up to/including completion of high school or GED [†] program | 3.90 (2.21-6.86) | <0.001 | 1.85 (0.96-3.58) | 0.067 |
| Education after high school | 1.00 | Ref. | 1.00 | Ref. |
| Relationship status | | | | |
| Partnered | 1.00 | Ref. | 1.00 | Ref. |
| Single/Divorced/Separated | 3.34 (1.44-7.76) | 0.005 | 1.59 (0.61-4.17) | 0.347 |
| Insurance | | | | |
| Government/None | 9.29 (4.55-18.95) | <0.001 | 5.55 (2.54-12.12) | <0.001 |
| Private | 1.00 | Ref. | 1.00 | Ref. |
| Planned pregnancy | | | | |
| Yes | 1.00 | Ref. | 1.00 | Ref. |
| No | 1.89 (1.09-3.27) | 0.024 | 1.09 (0.55-2.15) | 0.803 |

Model includes 233 patients (83 with non-urgent use, 150 without non-urgent use).

Full model fit: AUC-ROC = 0.79, goodness-of-fit p=0.29.

[†]General Equivalency Diploma