Prenatal Patients' Views of Prenatal Care Services: A Medical Center-Based Assessment of Knowledge and Intent to Use Support Services

Background: Our objective was to ascertain the priority of prenatal support services from the perspective of high-risk patients. The relationship between patients' needs, and both knowledge of and intent to use services, was examined, while documenting factors associated with the intent to use available support services.

Methods: The authors of this study conducted a cross-sectional survey of 102 African-American women at a university-affiliated, urban-health center. Patients' priority support needs were compared to their knowledge of and intent to use support services using chi-square statistics. Logistic regression was used to determine factors independently associated with patients' intent to use 5 support services (substance abuse counseling, community referrals, health education, nutrition services, and social work services), while adjusting for potential socioeconomic confounding variables, knowledge, and need for services.

Results: Knowledge of existing services was independently associated with patient intent to use one or more support services (odds ratio 3.6; confidence interval 1.4–9.4). With each one-unit increase in parity, a 30% less odds (odds ratio 0.7; confidence interval 0.4–0.9) of using one or more support services occurred.

Conclusions: Physicians should ensure prenatal patients' knowledge of support services at healthcare centers. Multiparity is inversely related to women's intent to use support services, independent of their knowledge of service availability. (*Ethn Dis.* 2004;14:13–20)

Key Words: Prenatal Support Services, Patient-Centered Care, Needs Assessment

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Introduction

Numerous studies have shown a positive association between the use of prenatal support services (eg, social work services, transportation, health education) and pregnancy outcomes among low-income women.[1–5] Yet, few studies have collected data on pregnant women's views of these same prenatal support services. Data on what support services are a priority for low-income pregnant women,[6–9] as well as the association between perceived need and knowledge of support services, or the factors that affect pregnant women's intent to use services remain limited. While most of these studies[3–5] are retrospective and based on clinical data, the evaluation of support services use based on the patient's perspective or patient-centered care is garnering greater attention within the healthcare system.

Patient-centered care is defined as health care that is compatible with and responsive to patients' values, needs, and preferences.[10] Previous prenatal studies have focused on women's preferences for prenatal diagnosis[11] and various clinical models for the delivery of prenatal services.[12] Within this framework, a patient-centered study was conducted utilizing a needs assessment questionnaire, which was administered to prenatal patients attending a university-based health center. The objectives were to: 1) determine the feasibility of conducting a needs assessment survey at the health center; 2) identify priority prenatal support services from the perspective of low-income, pregnant women; and 3) describe the relationship between perceived need for services, knowledge of support services, and intent to use support services. Our hypotheses were that women's knowledge of on-site services would be associated with the intent to use services and that multiparity would be associated with a less likely intent to use support services. Our clinical experience tells us that women who express an awareness of a particular service are much more likely to use the service. Because of their previous experiences with pregnancy and childbirth, multiparous women may be less likely to use support services.

Materials and Methods

Study Design

The investigators conducted a cross-sectional study among African-American women receiving prenatal care at an urban health center. Prenatal patients were recruited into the study over a 2-month period from December 1, 1998 to January 31, 1999. Patients were eligible for the study if they met the following criteria: 1) initiated prenatal care by 37 weeks gestation; 2) intended to continue with the pregnancy; 3) had an initial nurse visit; and 4) completed at least one prenatal care visit with a physician or nurse midwife. We included only those patients who had completed an initial prenatal nurse and physician or nurse midwife visit to ensure that they had been made aware of available support services. Patients who initiated prenatal care after 37 weeks gestation were excluded because they would not

Data on what support services are a priority for low-income pregnant women,[6–9] as well as the association between perceived need and knowledge of support services, or the factors that affect pregnant women's intent to use services remain limited.

have had adequate time to become knowledgeable of support services prior to delivery. Because the goal of the analysis was to identify priority service needs for women throughout pregnancy, the study was limited to patients who intended to carry their pregnancies to term.

A power analysis was conducted based on the assumption that approximately 100 patients could be recruited over a 2-month study period. Intent to use one or more support services vs no intent to use services, was the outcome variable used in the power analysis. Assuming a modest effect size of 0.17 (odds ratio 2.0), and $P=.05$, a calculation was made that a sample size of 100 patients would provide 80% power to determine an association between knowledge and intent to use support services.

Patients were recruited on randomly selected days over the 8-week study period. Medical records were reviewed prior to the beginning of the clinical sessions to determine which patients were eligible for the study. Patients who met the entry criteria were asked to participate in the study, as they entered the prenatal clinic for a routine prenatal appointment. One of the investigators (BB) introduced herself to potential par-

ticipants and gave a brief summary of the proposed project. If the patient agreed to participate in the study, they were directed to a private room to complete the self-administered survey. This study was approved by the Institutional Review Board.

Study Setting

The study was conducted in a university-affiliated, urban medical center that provides general medicine, pediatric, and prenatal care services primarily to low-income, Medicaid recipients. The poverty rate in the area surrounding the center is the highest in the city, ranging from 22% to 60% across 6 neighborhoods. Approximately 85% of the prenatal patients receive Medicaid, while 15% are covered by private insurance. Over 96% of the patients are African-American. The center's health care team consists of on-site nutritionists, health educators, social workers, and substance abuse counselors. Health educators provide information on pregnancy, general health, and other available clinical services (general medicine, pediatrics, dental care, radiology services) at the center. Nutritional counselors make dietary recommendations for pregnancy, management of chronic diseases (eg, diabetes, hypertension) and weight loss. Social workers provide counseling for physical abuse, as well as family and interpersonal relationship issues. Social workers also offer assistance with community-based child-care services and conduct small group classes on parenting skills as part of a core group of pediatric support services. Physicians and support staff can arrange transportation services directly for patients through community-based transportation services. Alternatively, the patient can be referred by the center to the appropriate community organizations.

Our clinic maintains a standard protocol for orienting new prenatal patients to the services available at the center. Prenatal patients have an initial visit with an obstetrical nurse who takes a

comprehensive medical and psychosocial history. At that time, the nurse provides the patient with information on all clinical and non-clinical support services offered at the center. During subsequent visits, both physicians and nurse midwives provide additional information on support services.

Description of Needs Assessment Questionnaire

Our goal was to incorporate a needs assessment questionnaire into our study protocol using a questionnaire that had been validated in multiple populations of pregnant women. The investigators conducted a systematic review of the literature, but found few questionnaires that met this criteria. The *California Perinatal Needs Assessment Survey* was identified as a validated survey instrument that had been previously used to assess non-clinical support service needs among pregnant women enrolled in state-based, drug treatment centers. This needs assessment questionnaire examines 9 categories of patient support needs: 1) transportation, 2) general healthcare information, 3) child care, 4) information on what to expect during pregnancy, 5) information on other clinical services (eg, general medicine, pediatrics), 6) parenting skills, 7) family/relationship counseling, 8) substance abuse counseling (drug, alcohol, smoking), and 9) physical abuse. Details of the survey design and validation studies have been previously published.[13]

Definition of Variables

Several demographic and clinical characteristics were collected for analysis: age, educational level, marital status, parity (one or more live births), trimester of pregnancy, gestational age at the first prenatal care visit, gestational age at the time of the study questionnaire, total number of prenatal care visits, current substance abuse (smoking, alcohol, drug use), current physical abuse, and payment source (Medicaid, private insurance). Adequacy of prenatal care was

determined using the Kessner Parameter Index[14] in which prenatal care is classified into 3 categories (adequate, intermediate, and inadequate) based on the current gestational age of the pregnancy and the number of completed prenatal visits. For the purposes of this analysis, adequacy of prenatal care was re-categorized as adequate and inadequate care.

Knowledge and Intent to Use Support Services

A modified version of the needs assessment portion of the Perinatal Needs Assessment Survey was used to identify the priority needs of the patient population and to examine patient knowledge, and intent to use support services at the center. First, prenatal patients were given a list of the 9 support needs and asked to identify 3 support needs that they believed were a priority for them to receive optimal pregnancy care. Patients were then given a list of the 5 support services available at the center and asked whether they were knowledgeable (aware) of any of the support services: substance abuse counseling, community referrals, health education, nutritional services, and social work services. Based on the anecdotal experience of the center's clinical staff, transportation was thought to be a priority need among pregnant women. Therefore, additional questions about transportation were added to the questionnaire to elicit women's primary modes of transportation to the center.

Intent to Use Services

Patients were also asked about their intent to use any of the 5 available support services. For example, for social work services, patients were asked the following question: Do you intend to use social work support services during this pregnancy? Each individual support service was used as a dichotomous variable. Also, a composite variable, one or more support services, was generated and defined as the intent to use any one of the 5 support services. This variable

was modeled as a dichotomous variable (intent to use one or more services vs no intent to use services).

Analysis of Participant Responses

Because one of our a priori hypotheses was that parity would be an important predictor of intent to use support services, patient characteristics were compared by parity using chi-square statistics for categorical variables and the *t* test for continuous variables (age, number of visits, years of education). In a separate analysis, the demographic characteristics of the study participants were compared to non-participants attending the center during the same study period.

The association between a patient's need for services, knowledge of services, and intent to use support services was examined in bivariate analysis using the chi-square statistic. Each priority service need was linked to the appropriate on-site support service. For example, we examined the relationship between knowledge and intent to use on-site health educational services among patients who had identified information on what to expect during pregnancy, as a priority need. Each priority need and corresponding on-site support service is listed below:

Transportation assistance, child care (community referral);
Health and nutritional information (health education);
Pregnancy information (health education);
Information on other clinical services available at the center (health education);
Parenting skills, family/relationship and physical abuse counseling (social work);
Substance abuse counseling (substance abuse counselors).

The association between sociodemographics and the intent to use each of the 5 available support services was examined using bivariate analysis in

which unadjusted odds ratios were estimated. Sociodemographic variables were re-categorized into dummy variables: payment source (private vs Medicaid); educational level (more than 12 years vs 12 years or less); marital status (married vs single); adequacy of prenatal care (adequate vs inadequate); and knowledge of each on-site service (knowledge vs no knowledge). Age, parity, and number of visits were analyzed as continuous variables. Priority needs (eg, need for transportation) were modeled as dichotomous variables. *P* values ≤0.1 were considered significant in the bivariate analysis.

In multivariate analysis, logistic regression was used to determine the independent effect of parity and knowledge of services on women's intent to use one or more support services.[15] Separate logistic regression models were also derived for each individual support service. The results of the bivariate analysis guided the selection of factors included in the multivariate models. Variables in the logistic regression models that were significant in the bivariate analysis at a *P* value of .1 were included. An individual regression model for substance abuse was not constructed because knowledge of substance abuse counseling was the only factor found to be associated with this service in the bivariate results.

For use of any support services, the model was adjusted for education, parity, need for transportation, need for other clinical services, and knowledge of any support services. For community referrals, the model was adjusted for parity, need for transportation, and knowledge of services. The model for health education included educational level, need for information on general health, pregnancy, clinical services available at the center, and knowledge of health education services. The model for nutritional services was adjusted for educational level, parity, need for nutritional information, and knowledge of nutritional services. The model for social work was adjusted for educational level,

Table 1. Characteristics of prenatal respondents in needs assessment study

Characteristics	Total Sample N = 102	Multiparous N = 75 (74%)	Nulliparous N = 27 (26%)	Statistic	P value*
Age, yrs. (mean ± SD)	22 ± 5.8	25 ± 0.7	18 ± 0.6	−6.025	<.001
Payment source (%)					
Medicaid	70	72	63	5.2	.08
Private/commercial	30	18	37		
Education, yrs (mean ± SD)	10 ± 1.2	12 ± 0.2	11 ± 0.3	0.5	.6
Single status (%)	92	90	96	0.9	.3
Gestational age, wks. (mean ± SD)	24 ± 9.8	26 ± 9	24 ± 10	0.7	.5
Number prenatal visits, days (mean ± SD)	4 ± 3.4	4 ± 0.4	5 ± 0.6	1.0	.3
Inadequate visits† (%)	70	70	71	0.0057	.9
Physical abuse (%)	11	10	3	0.003	.5
Substance abuse (%)	3	3	‡	‡	‡

* P values are based on chi-square statistic for categorical variables and *t* test for continuous variables (age, education, number of prenatal visits).
† Inadequate visits based on modified version of Kessner Index which incorporates the current gestational age and number of prenatal visits.
‡ No percentage of nulliparous women reported substance abuse, so no *P* value was calculated.

parity, the number of prenatal visits, and knowledge of social work. *P* values less than .05 were considered significant in the multivariate analysis. Statistical analysis was performed using STATA 7.0 (Stata Corp, Texas).

RESULTS

Response Rate and Participant Characteristics

A total of 105 women were asked to participate in the study. A sample of 102 (97% response rate) patients completed the interview. The demographics of the study participants were not demographically different (race, payment source, marital status, number of visits) from non-participants who presented for care during the same study period.

Table 1 summarizes the characteristics of the study sample and shows the distribution of characteristics between multiparous and nulliparous prenatal patients. The average age of the patients surveyed was 22 years (SD=±5.8). Multiparous women were older than nulliparous women (*P*<.001). While 70% of the patients were Medicaid recipients, 30% of the patients were covered by private insurance. No difference in educational level or marital status existed between the 2 patient groups. At the time the questionnaire was admin-

istered, multiparous women were at a higher gestational age compared to nulliparous women (26 ± 9 wks vs 24 ± 10 wks). The average number of prenatal visits was similar between mulitparous and nulliparous women (4 ± 0.4 visits vs 5 ± 0.6 visits). Both groups had a high proportion of women with an inadequate number of visits according to the Kessner Index. Few patients reported current physical or substance abuse.

Priority Support Services

Table 2 shows the relationship between priority service needs and the knowledge and intent to use available support services. As shown in Table 2, transportation assistance was reported by 40% of the patients as a priority support service. Nutritional information, general healthcare information (31%), child-care (28%), and information on what to expect during pregnancy (27%) were also identified as priority support services. Approximately 18% and 12% of patients reported parenting skills and family/relationship, respectively, as priority services. Few patients identified substance abuse (8%) or physical abuse (3%) as priority services.

When respondents were questioned further about their modes of transportation, the majority of patients reported that they used public transportation

(bus, subway) (39%) to get to the center. Over a quarter of the patients walked, traveled by cab, or requested rides from family or friends. Only one-fifth of the patients reported that they had access to their own personal car (data not shown).

Descriptive Comparison of Knowledge and Intent to Use Services

Table 2 also shows the association between priority service needs and knowledge and intent to use support services from the bivariate analysis. Only a small difference was noted between the percentage of patients that reported the need for a specific service and the proportion of patients that were knowledgeable about the on-site support services that were available to address their needs. For example, 40% of patients identified transportation as a priority need. Thirty-five percent of those same patients were aware of community resources that could address their need for transportation. While 27% of patients needed information about pregnancy, all 27% were aware of health education services.

Nevertheless, among those reporting a need for a service, some differences were noted in knowledge of services vs intent to utilize these services. Although 40% of patients identified transporta-

Table 2. Comparisons between knowledge and intent to use support services among patients reporting needs

Priority Services	Need* %	On-site Support Service	Knowledge of Support Service		Intent to Use Support Service	
			%	λ_2 (*P* value)†	%	λ_2 (*P* value)‡
Transporation	40	Community referrals	35	2.1 (.3)	24	6.9 (.03)
Nutrition information	32	Nutritionist	58	0.7 (.4)	50	4.2 (.1)
General health information	31	Health education	36	3 (.5)	11	5 (.09)
Child care	28	Community referrals	17	0.4 (.8)	25	2.5 (.2)
Information on pregnancy	27	Health education	27	0.3 (.9)	44	5.5 (.08)
Information on other clinical services	23	Health education	29	0.7 (.6)	41	5.4 (.08)
Parenting skills	18	Social work	21	0.004 (.9)	—	§
Family/relationship counseling	12	Social work	2	6.1 (.03)	3	0.7 (.4)
Substance abuse	8	Drug counseling	6	1.8 (.4)	—	§
Physical abuse	3	Social work	4	1.7 (.2)	3	0.4 (.8)

* Percentage of patients in the sample that identified the service as one of 3 priority needs.
† *P* values compare the patient's priority need with the knowledge of the appropriate on-site service that addresses the need.
‡ *P* values represent the comparison between patient knowledge of the service and intent to use the service among those reporting a priority need. *P* values are based on the chi-square statistic and values ≤.1 are considered significant.
§ No chi-square statistic since no patients reported the intent to use these services.

tion as a priority need and 35% were aware of community referrals for transportation, only 24% of patients intended to use community referrals for transportation. While 36% of patients reported knowledge of health education services for general health information, only 11% reported that they intended to use the service.

Conversely, a higher proportion of patients reported the intent to use community referrals for childcare and health education for information on pregnancy and other clinical services than the proportion that were knowledgeable of these services. For example, 27% of women reported that they were knowledgeable of health education services pertaining to pregnancy information, but a much higher percentage of women (44%) reported the intent to use those services. Also, 17% of patients were knowledgeable of community referrals for childcare, yet 25% of patients reported the intent to use this service. Regarding information on clinical services, only 29% of patients were aware of the gamut of health education information provided; yet, 41% of patients reported that they intended to use the health education resources at the center.

Relationship of Patient Characteristics and Intent to Use Services

A variety of sociodemographic and clinical factors were related to the intent to use support services. Table 3 shows the unadjusted odds ratios for the association of patient characteristics and the intent to use individual support services from the bivariate analysis. For each one-unit increase in age, there was a 10% lower odds of the intent to use substance abuse counseling, community referrals, health education, and nutritional services. For respondents with private insurance, there was a 1.2 to 1.4 times greater odds of the intent to use nutritional services and community referrals. Private insurance was associated with a 40%–50% reduction in the intent to use substance abuse counseling or health education services. Compared to women with 12 years or less of education, women with more than 12 years of education had 20%–50% less odds of using substance abuse counseling, community referrals, health education, nutritional, or social work services. Married women had a 2.2 and 1.3 times greater odds of using substance abuse counseling and health education compared to single women, but these findings were not statistically significant.

Parity was significantly associated with the use of community referrals and nutritional services. With each one-unit increase in parity, there is a 30% less odds of using community referrals and nutritional services. Surprisingly, women with adequate prenatal care had 20% to 30% less odds of using substance abuse counseling, community referrals, health education, and nutritional services. Adequate care was associated with a 1.6 times higher odds of the intent to use social work services, but this finding was not significant. As expected, knowledge of services was associated with a 1.5 to 1.6 higher odds of the intent to use social work services, health education, and substance abuse counseling. However, knowledge was associated with a 30% less odds of the intent to use community referrals. The number of prenatal visits was associated with the intent to use social work services. Knowledge of service and parity were associated with the intent to use one or more services.

Independent Factors Associated with the Intent to Use Services

In multivariate analysis, the independent effect of patient knowledge of support services on the intent to use one

Table 3. Unadjusted relation between demographic factors, clinical factors and intent to use support services

Patient Characteristics	One or More Support Services Odds Ratio* (95% CI)†	Substance Abuse Odds Ratio (95% CI)	Community Referrals Odds Ratio (95% CI)	Health Education Odds Ratio (95% CI)	Nutrition Services Odds Ratio (95% CI)	Social Work Odds Ratio (95% CI)
Age	0.9 (0.8–1.0)	0.9 (0.8–1.1)	0.9 (0.8–1.04)	0.9 (0.8–1.03)	0.9 (0.8–1.02)	1.0 (0.9–1.1)
Private vs Medicaid	1.2 (0.4–3.5)	0.5 (0.1–2.5)	1.4 (0.5–4)	0.6 (0.2–2.1)	1.2 (0.4–4.4)	1.0 (0.3–2.8)
>12 yrs vs ≤12 yrs	0.5‡ (0.2–1.0)	0.8 (0.2–2.3)	0.7 (0.3–1.6)	0.5‡ (0.2–1.3)	0.5‡ (0.2–1.2)	0.5‡ (0.2–1.2)
Married vs single	0.9 (0.2–4.2)	2.2 (0.3–13)	0.9 (0.2–5.5)	1.3 (0.3–6.4)	0.4 (0.1–2.1)	0.5 (0.1–2.9)
Parity	0.7‡ (0.5–0.9)	0.8 (0.6–1.3)	0.7‡ (0.6–1.0)	0.8 (0.6–1.1)	0.7‡ (0.5–0.9)	0.8‡ (0.6–1.1)
Adequate vs inadequate care	0.8 (0.3–2.1)	0.7 (0.2–2.5)	0.8 (0.3–2.2)	0.6 (0.2–1.8)	0.8 (0.3–2.1)	1.6 (0.6–4.0)
Number of visits	1.0 (0.9–1.1)	1.1 (0.9–1.2)	0.9 (0.8–1.1)	0.9 (0.8–1.1)	1.0 (0.9–1.2)	1.1‡ (0.9–1.3)
Knowledge of service	3.6‡ (1.4–9.3)	1.5‡ (1.2–1.9)	0.7‡ (0.3–2.1)	1.6‡ (1.0–2.6)	1.1‡ (0.5–2.5)	1.5‡ (0.6–3.6)

 * Odds ratios are unadjusted estimates from the bivariate analysis. An odds ratio that is greater than one indicates patients with the characteristic have the intent to use on-site support services. An odds ratio that is less than one indicates that patients with the characteristic have less intent to use on-site support services.

 † 95% CI = 95% confidence interval.

 ‡ Denotes a significant odds ratio at a level of *P*≤.1.

or more of the 5 on-site support services was determined, after adjustment for socio-demographic and clinical factors. Knowledge of services was associated with a 3.6 times greater odds of the intent to use one or more support services compared to no knowledge of services. Parity was associated with 30% less odds of the intent to use any services. The need for information on other clinical services was also associated with intent

to use one or more services. Higher educational level and the need for transportation was associated with a 20%–30% less odds of using support services, but these findings were not significant.

Several factors were independently associated with the intent to use individual support services. The need for information on pregnancy and other clinical services available at the center was associated with a 3.0 to 3.3 times great-

er odds of the intent to use health education services. The need for general health information was associated with less intent to use health education services, but the finding was not significant. Parity was associated with 30% lower odds of the intent to use nutritional services.

Although not statistically related, patterns of association emerged between certain patient factors and the intent to

Table 4. Relation between demographic factors, clinical factors, and intent to use prenatal support services

Demographic Factors	One or More Services‡ Odds Ratio* (95% CI)†	Community Referrals§ Odds Ratio (95% CI)	Health Education‖ Odds Ratio‖ (95% CI)	Nutrition Services¶ Odds Ratio¶ (95% CI)	Social Work Odds Ratio# (95% CI)
>12 yrs vs ≤12 yrs	0.8 (0.5–1.3)	—	0.7 (0.2–1.3)	0.6 (0.2–1.4)	0.8 (0.3–2.1)
Parity	0.7†† (0.4–0.9)	0.7 (0.5–1.1)	—	0.7†† (0.5–0.9)	0.8 (0.6–1.1)
Number of visits	—	—	—	—	1.1 (0.9–1.2)
Need for transportation	0.7 (0.3–1.8)	0.4 (0.1–1.2)	—	—	—
Health information	—	—	0.8 (0.6–1.1)	—	—
Information on pregnancy	—	—	3.3†† (1.2–8.7)	—	—
Information on nutrition	—	—	—	1.8 (0.7–4.3)	—
Information on other clinical services	3 (1.0–9.0)	—	3.0†† (1.1–8.0)	—	—
Knowledge of service	3.6†† (1.4–9.4)	0.7 (0.2–2.1)	1.3 (0.5–3.3)	1.2 (0.5–2.9)	1.0 (0.4–2.1)

 * An odds ratio greater than one indicates that patients with the characteristic compared to those without the characteristic have a higher odds of the intent to use onsite support services. An odds ratio less than one indicates that patients with the characteristic compared to patients without the characteristic have a lesser odds of the intent to use onsite support services.

 † 95% CI = 95% confidence interval.

 ‡ Adjusted for knowledge of one or more services, education, parity, need for transportation, and need for information on other services.

 § Adjusted for parity, knowledge of community referral services, and need for transportation.

 ‖ Adjusted for maternal education level, knowledge of health education services, need for information on health, pregnancy, and other services.

 ¶ Adjusted for maternal education, parity, need for information on nutrition, and knowledge of nutritional services.

 # Adjusted for age, parity, number of visits, and knowledge of service.

 †† Denotes a significant odds ratio because the confidence interval does not include one.

use specific services. Increasing parity, for example, was associated with a 20% to 30% reduction in the intent to use support services. Similarly, higher educational levels were associated with a reduction in the intent to use services. Knowledge of services was associated with greater odds of the intent to use health education and nutritional services. Multiparity, need for transportation, and knowledge of services were associated with a 30% to 60% less odds of the intent to use community referrals.

DISCUSSION

The purpose of this study was to use a patient-centered approach to identify priority service needs and factors associated with low-income, urban women's intent to use on-site support services. While debate continues regarding the effectiveness of prenatal care, timely access and use of prenatal care services among high-risk women remains an important focus of healthcare providers. The results of the current analysis parallel those of previous studies that found an association between knowledge and use of services. Korenbrot and colleagues[6] found a higher utilization of comprehensive prenatal services among Hispanic women who were knowledgeable of providers that offered additional prenatal services as a part of their overall healthcare services to patients. Similarly, Alexander and associates[9] found higher utilization of prenatal services among low-income women attending clinics staffed with dedicated nurse educators and among clinics offering support services.

In the current analysis, little correlation was found between women's priority service needs, knowledge of services that addressed the need, and intent to use services. From the bivariate analysis, inverse relationships between knowledge and intent to use services were found for most on-site support services. Specifically, the inverse relation-

The results of the current analysis parallel those of previous studies that found an association between knowledge and use of services.

ship between knowledge of community referrals for transportation, knowledge of health education for general health information and the intent to use these services was surprising. These results suggest that other psychosocial or personal factors, in addition to knowledge, affect urban women's decisions to use prenatal support services. For example, women may feel embarrassed about their need to use transportation services. Because the center is located in a small community, women may be reluctant for relatives or neighbors to know that they are in need of transportation. Another possible explanation is that low-income women with unintended pregnancies may not use available services regardless of their needs. Also, low-income women may be reluctant to admit the need for additional education or may not be comfortable requesting information. In a study of 297 African-American women, York and colleagues[16] found that the lack of desire for pregnancy and drug use were the 2 most important personal factors associated with poor prenatal support service use. A qualitative study[17] of low-income prenatal patients found that patients' perceptions of negative attitudes from healthcare providers helped to explain some of the variation in use of prenatal services. Racial differences in urban patients' perceptions of healthcare providers have been previously documented. Cooper and colleagues[18] studied over 1,000 adults attending primary care clinics in an urban setting. African-

American patients reported their visits with physicians as overall less participatory compared to White patients. Future analyses of urban prenatal patients should include data on both healthcare provider characteristics (eg, race, age) and women's desire for pregnancy.

Some patients, who were not previously aware of specific services, reported that they intended to use the service. Although only a small proportion of women were previously aware of health education sources of information and community referrals for childcare (17% and 27%, respectively), a higher proportion of respondents reported the intent to use these services. These women most likely became aware of these services while completing the survey and made the decision at that time to use the services during the current pregnancy. Previous studies have shown that the provision of information during patient surveys can change patient behaviors.

From the multivariate analysis, knowledge of service was the strongest factor associated with the intent to use one or more services, emphasizing the role of patient knowledge in healthcare behaviors. The relation between need for information on other clinical services at the center and intent to use health education services may reflect the role of women in healthcare decision-making. Previous studies have shown that women make most healthcare decisions for their children and other family members.[19] By seeking information on available services, women can make recommendations about where their spouses and children should receive care. The relationship between parity and intent to use support services deserves further comment. The lack of intent to use services among multiparous women may be due, in part, to their own perception that they are already very knowledgeable and do not need additional services. Alternatively, multiparous women may have childcare commitments that prevent them from utilizing the services. If the intent to use prenatal support ser-

vices decreases with parity, there may be fewer opportunities for physicians to provide supportive interventions to patients, particularly to those who are known to be high-risk based on complications in previous pregnancies. Therefore, healthcare providers may be limited in their ability to improve subsequent pregnancy outcomes through targeted support services. Additional studies addressing the relationship between women's social and clinical characteristics and their decision-making process are necessary to fully explain variations in use of services.

Our study was not without limitations. Our patient sample represented high-risk, urban, African-American women and is therefore not generalizable to all pregnant women. Our goal was to identify priority needs in low-income, high-risk women; therefore, the results are generalizable to patients at other urban, university-based centers. Although the needs assessment questionnaire used in our analysis has been validated in multiple populations of pregnant women enrolled in drug treatment programs, only 3% of our patient sample reported substance abuse. Nevertheless, our study population had demographic (ie, race, insurance status, parity) similarities to the participants in the study in which the questionnaire was originally validated.

While the current analysis and other published studies have identified several key factors to explain the variation in support services use, the persistently poor use of services, particularly among urban African-American women, suggests that other, as yet unmeasured, factors affect women's decisions to use ad-

ditional services. While these results represent a first step toward the use of a patient-centered approach to ascertain patient's views on prenatal services, continued efforts are necessary to improve women's use of services and ultimately improve birth outcomes among African-American women.

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AUTHOR CONTRIBUTIONS