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Impact of Psychosocial Risk Factors on Prenatal Care Delivery: A National Provider Survey

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Abstract

Objective—To evaluate providers' perspectives regarding the delivery of prenatal care to women with psychosocial risk factors.

Methods—A random, national sample of 2095 prenatal care providers (853 obstetricians and gynecologists (Ob/Gyns), 270 family medicine (FM) physicians and 972 midwives) completed a mailed survey. We measured respondents' practice and referral patterns regarding six psychosocial risk factors: adolescence (age < 19), unstable housing, lack of paternal involvement and social support, late prenatal care (> 13 weeks gestation), domestic violence and drug or alcohol use. Chi-square and logistic regression analyses assessed the association between prenatal care provider characteristics and prenatal care utilization patterns.

Results—Approximately 60% of Ob/Gyns, 48.4% of midwives and 32.2% of FM physicians referred patients with psychosocial risk factors to clinicians outside of their practice. In all three specialties, providers were more likely to increase prenatal care visits with alternative clinicians (social workers, nurses, psychologists/psychiatrists) compared to themselves for all six psychosocial risk factors. Drug or alcohol use and intimate partner violence were the risk factors that most often prompted an increase in utilization. In multivariate analyses, Ob/Gyns who recently completed clinical training were significantly more likely to increase prenatal care utilization with either themselves (OR=2.15; 95% CI 1.14–4.05) or an alternative clinician (2.27; 1.00–4.67) for women with high psychosocial risk pregnancies.

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Conclusions—Prenatal care providers frequently involve alternative clinicians such as social workers, nurses and psychologists or psychiatrists in the delivery of prenatal care to women with psychosocial risk factors.

Keywords

health care utilization; prenatal care; psychosocial

INTRODUCTION

Pregnancies complicated by psychosocial risk factors have been significantly associated with an increased risk of adverse birth outcomes such as preterm birth and low birth weight (LBW).[1–5] In particular, psychosocial stress, often preceded by a lack of social support, poor self-esteem or poor coping ability, has been correlated with maladaptive health behaviors and is more prevalent among women who deliver preterm or LBW infants.[6, 7] Consequently, in 2006, the American College of Obstetricians and Gynecologists (ACOG) called for the incorporation of routine psychosocial risk factor screening into prenatal care, noting that “the biomedical risks of pregnancy were estimated to account for only half of the incidence of LBW while the remaining cases may be attributable to psychosocial risk factors.”[8]

Psychosocial risk factors such as stress, lack of social support and intimate partner violence (IPV) have been successfully reduced in pilot interventions providing intensive, risk-appropriate prenatal care services.[9–11] In a population-based analysis of over 3,000 Medicaid-eligible women with psychosocial risk factors, mothers who attended at least 10 enhanced prenatal care visits, which included case management and psychosocial counseling, were more likely to resolve their risk factors than women who had fewer visits. In addition, women who resolved all of their risks had a LBW rate of 7.0% compared to 13.2% among women who resolved no risks.[9]

Despite evidence that enhanced prenatal care services may reduce the impact of psychosocial risk factors on adverse birth outcomes, evaluations of women with high psychosocial risk pregnancies indicate that they often do not receive intensive prenatal care services.[12, 13] In an evaluation of the prenatal care utilization patterns of women with high psychosocial risk pregnancies, only 11% of women with psychosocial risk factors received intensive or “adequate plus” prenatal care services.[14] Moreover, evaluations of prenatal records demonstrate significantly lower rates of provider compliance with psychosocial risk factor assessment and counseling during prenatal care visits compared to compliance with laboratory tests and physical evaluations.[15–17] This lack of intensive, risk-appropriate prenatal care services for many women with high psychosocial risk pregnancies may be due to provider level factors such as an underestimation of the prevalence of psychosocial risk factors, inadequate training, time constraints and a belief by providers that many interventions are ineffective.[18] Variation in approach towards psychosocial risk factors such as alcohol, tobacco and substance abuse during pregnancy has also been demonstrated among different types of prenatal care providers.[18]

The delivery of prenatal care to patients with psychosocial risk factors has not been evaluated from the perspective of the prenatal care provider. As a result, we conducted a national survey of obstetricians and gynecologists, midwives and family medicine physicians to evaluate their perspectives regarding the delivery of prenatal care to women with high psychosocial risk pregnancies. The aim of our study was to determine prenatal care providers' practice and referral patterns for patients with at least one of six psychosocial risk factors associated with psychosocial stress and adverse birth outcomes: adolescence (age < 19), unstable housing, lack of paternal involvement and social support, late prenatal care (> 13 weeks gestation), domestic violence and drug or alcohol use. This evaluation of provider practice and referral patterns can identify ways to improve the prenatal care delivery process for women with high psychosocial risk pregnancies.

METHODS

Data Source

From October 2010 to May 2011, a mailed survey was sent to a random, national sample of prenatal care providers including obstetricians and gynecologists (Ob/Gyns), family medicine (FM) physicians and midwives. Ob/Gyns and FM physicians were identified through the American Medical Association Masterfile database. Midwives were identified through the American College of Nurse-Midwives (ACNM) membership database.

A total of 7792 surveys were sent to a random sample of 2292 Ob/Gyns, 3500 FM physicians and 2000 midwives. In addition to the survey, a cover letter explaining the study, a self-addressed stamped envelope and a \$2 bill were included in the survey packet. Because we were unable to determine which providers provided obstetric services, a self-addressed, stamped postcard was also included for providers to return if they had not provided prenatal care during the year prior to completing the survey. The first mailing was followed by two additional mailings to non-respondents according to the Dillman method.[19]

Survey data was validated through a double entry process. Two researchers experienced in data extraction individually and separately extracted each response from each survey and entered the responses into two separate databases. These two datasets were then merged and analyzed for discrepancies between the entered data. Each discrepancy was reviewed and resolved by the primary author through a third review of the survey. IRB approval was obtained through the University of Michigan Medical School Institutional Review Board for Human Subjects Research.

Survey Instrument

The mailed survey consisted of 25 questions focused on describing the practice patterns of prenatal care providers. Out of 25 survey questions, 14 were designed to address providers' perceptions regarding prenatal care delivery to women with psychosocial risk factors. The remaining 11 questions were designed to address providers' perceptions regarding prenatal care delivery to low-risk women without medical or psychosocial risk factors and were not included in this analysis. The survey instrument was pretested by conducting cognitive

interviews with 3 Ob/Gyns, 2 FM physicians and 1 midwife.[20] Survey questions and answer choices were modified after reviewing the results of the cognitive interviews.

Six psychosocial risk factors were evaluated: adolescence (age < 19), unstable housing, lack of paternal involvement and social support, late prenatal care (> 13 weeks gestation), domestic violence and drug or alcohol use. Prior to the questions, prenatal care providers were given a clinical vignette involving a hypothetical pregnant patient presenting for her first prenatal care visit and who denied any prepregnancy medical, surgical or obstetric risk factors that could necessitate an increase in prenatal care utilization beyond the psychosocial risk factors we evaluated. Providers were asked to describe the percentage of patients in their clinical practice who have at least one psychosocial risk factor. Providers were then asked how they managed patients with psychosocial risk factors by indicating that they either a) referred patients to a clinician or facility outside of their clinical practice or b) managed patients within their clinical practice. Finally, providers were asked to indicate if they would change the frequency of prenatal care visits (increase, decrease or no change) with a) a prenatal care provider or b) an alternative clinician for each of the six psychosocial risk factors evaluated. For example, providers were asked, “For the following conditions, indicate if you would change the frequency of follow-up prenatal care visits with a physician or midwife?” and “For the following conditions, indicate if you would change the frequency of follow-up prenatal care visits with a clinician such as a social worker or nurse who counsels patients with psychosocial risk factors?” Providers were instructed to consider each psychosocial risk factor separately.

Provider and Prenatal Care Utilization Variables

Our primary outcome was an increase in prenatal care utilization for high psychosocial risk pregnancies. High psychosocial risk pregnancies were defined as pregnancies complicated by at least one of the six psychosocial risk factors evaluated. Prenatal care utilization was dichotomized into an increase or not an increase (derived from survey responses “decrease” and “no change”) in prenatal care visits with a prenatal care provider or alternative clinician. An alternative clinician was defined as a social worker, nurse [licensed practical nurse (LPN), registered nurse (RN), physician assistant (PA), nurse practitioner (NP)] or psychologist/psychiatrist. Secondary outcomes included differences in prenatal care utilization and referral patterns among different types of prenatal care providers (Ob/Gyns, FM physicians and midwives).

Covariates included prenatal care providers’ demographic and psychosocial characteristics (Table 1 and Table 2). Due to small sample sizes, providers’ demographic characteristic, “years since completing clinical training” was collapsed into three categories (< 10 years, 11–20 years and >20 years) from the original survey categorization [a) less than 5 years, b) 5–10 years, c) 11–15 years, d) 16–20 years and e) greater than 20 years] for the purposes of analysis. Likewise, providers’ demographic characteristic “percent time spent in direct contact with patients” was collapsed into two categories (< 75% and >75%) from the original survey categorization [a) less than 25%, b) 26–50%, c) 51–75% and d) > than 75%] for the purposes of analysis. Practice regions were derived from the providers’ mailing address. Each region was composed of the following states: Northeast (Maine, New Hampshire,

Vermont, New York, Pennsylvania, New Jersey, Connecticut, Rhode Island, Massachusetts), South (Maryland, Delaware, District of Columbia, West Virginia, Virginia, Kentucky, North Carolina, Tennessee, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Oklahoma, Arkansas, Puerto Rico), Midwest (North Dakota, South Dakota, Nebraska, Kansas, Missouri, Iowa, Minnesota, Wisconsin, Illinois, Indiana, Michigan, Ohio) and West (Washington, Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Idaho, Nevada, Oregon, California, Alaska, Hawaii, Guam).

Data Analysis

Each survey question was individually analyzed. Chi-square analyses were conducted to compare demographic and psychosocial characteristics among Ob/Gyns, FM physicians and midwives. Chi-square analyses were also conducted to compare provider preferences regarding prenatal care utilization patterns for each of the six psychosocial risk factors evaluated. Finally, multivariable logistic regression analyses were conducted to determine which provider characteristics were significantly associated with increasing prenatal care utilization for high psychosocial risk pregnancies. Due to small cell size, region was excluded from the FM physician multivariable models. All analyses were conducted with Stata® 12 (StataCorp, College Station, TX). Missing values were excluded from the analysis. A p-value of <0.05 was considered statistically significant.

RESULTS

Out of 7792 providers initially sampled, 405 had a non-working address which resulted in an eligible sample size of 7387 prenatal care providers. Of 7387, 4123 providers [1269 (61.2%) Ob/Gyns, 1543 (46.3%) FM physicians and 1311 (66.0%) midwives] responded to our survey, leading to an overall response rate of 55.8%. Of responding providers, 2111 (51.2%) delivered prenatal care in the year prior to completion of the survey. The remaining 2012 (48.8%) providers responded that they did not deliver prenatal care in the year prior to completion of the survey and were excluded from the analyses. In addition, 7 providers did not indicate a specialty and 9 providers had an address in either Canada or Mexico and these providers were also excluded from our analysis. Therefore, our final sample consisted of 2,095 prenatal care providers (853 Ob/Gyns, 270 FM physicians and 972 midwives). All survey questions had less than 5% missing responses. Variations in the sample sizes listed in the tables compared to the overall response rate is due to missing values for those particular questions.

Table 1 describes the sample of providers who delivered prenatal care services in the year prior to completion of the survey. Among Ob/Gyns, the majority were female, from the South, in private practice and had been in practice for more than 20 years. Among midwives, the overwhelming majority were female, from the Northeast, in private practice and had been in practice for 11–20 years. Finally, among FM physicians, the majority were male, from the Midwest, a faculty member of a university teaching hospital and had been in clinical practice for less than 10 years. Over 65% of providers in all three specialties spent greater than 75% of their time in direct contact with patients in contrast to other responsibilities. The most common activity not related to patient care for providers in all

three specialties was teaching fellows, residents and medical students. Finally, providers were asked to determine which information sources were important for staying informed about prenatal care guidelines. Over 80% of Ob/Gyns and midwives responded that their professional organization (ACOG, ACNM) publications were “very important” sources of prenatal care information. In contrast, the majority of FM physicians responded that on-line websites were a “very important” source of prenatal care information.

The majority of Ob/Gyns did not deliver care to patients with psychosocial risk factors. Approximately 69% reported that less than 25% of their patients had at least one psychosocial risk factor (Table 2). Although FM physicians and midwives delivered care to a greater percentage of patients with psychosocial risk factors, approximately half had a clinical practice where less than 25% of their patients had at least one psychosocial risk factor. Likewise, only 14.6% of Ob/Gyns responded that the majority of patients in their clinical practice had at least one psychosocial risk factor in contrast to 32.0% of FM physicians and 31.8% of midwives ($p<0.01$). Approximately 60% of Ob/Gyns responded that they referred patients with psychosocial risk factors to clinicians or facilities outside of their clinical practice. In contrast, only 48.4% of nurse midwives and only 32.2% of family medicine physicians referred patients with psychosocial risk factors to clinicians or facilities outside of their clinical practice ($p<0.01$).

Table 3 describes the proportion of prenatal care providers’ who responded they would increase the number of prenatal care visits with a) prenatal care providers only, b) alternative clinicians only, c) both prenatal care providers and alternative clinicians or d) neither prenatal care providers nor alternative clinicians for each of the six psychosocial risk factors evaluated. Midwives and FM physicians were more likely to increase prenatal care visits with both alternative clinicians and themselves for all six psychosocial risk factors. Ob/Gyns were more likely increase prenatal care visits with alternative clinicians only for patients with unstable housing or lack of paternal involvement and social support. Drug or alcohol use [95.8% (Ob/Gyns) vs. 96% (midwives) vs. 97.4% (FM physician)] and intimate partner violence [94.8% (Ob/Gyns) vs. 96.5% (midwives) vs. 98.1% (FM physician)] were the risk factors that most frequently prompted an increase in prenatal care utilization with either a prenatal care provider, an alternative clinician or both. Late prenatal care was the risk factor that was least likely to prompt an increase in prenatal care utilization [38.5% (Ob/Gyns) vs. 45.2% (midwives) vs. 33.1% (FM physician)] with any provider.

The relationship between provider characteristics and prenatal care utilization patterns is shown in Table 4. The adjusted odds (controlling for all variables in the logistic model) of prenatal care providers increasing prenatal care utilization with either themselves (OR=2.15; 95% CI 1.14–4.05) or an alternative clinician (2.27; 1.00–4.67) were significantly greater for Ob/Gyns who completed clinical training less than 10 years prior to completion of the survey. In addition, the adjusted odds of increasing prenatal care utilization with a prenatal care provider was significantly less for Ob/Gyns (0.55; 0.32–0.94) and midwives (0.21; 0.08–0.59) who spent greater than 75% of their time in direct contact with patients. Finally, female FM physicians and midwives in HMO or hospital based practices were significantly more likely to increase prenatal care utilization with an alternative clinician for women with psychosocial risk factors. There was no significant relationship found between prenatal care

utilization patterns and the percentage of patients with psychosocial risk factors in the clinical practice of providers or provider region for all three specialties.

DISCUSSION

Our results indicate that the majority of Ob/Gyns refer patients with psychosocial risk factors to providers and facilities outside of their clinical practice instead of choosing to address these issues within their clinical practice. In contrast, only 30% of family medicine physicians chose to refer patients with psychosocial risk factors to providers and facilities outside of their clinical practice. This difference in referral patterns between Ob/Gyns and FM physicians may be due to a difference in training and comfort regarding psychosocial risk factor counseling. In a qualitative study of prenatal care providers' approaches to psychosocial risk factors, obstetricians felt "ill equipped" to manage issues related to domestic violence and other forms of abuse and "needed additional advice, tips and resources" to manage these patients.[18] In contrast, family medicine providers have a wider breadth of clinical training and may feel more equipped to handle a variety of psychosocial issues. In addition, almost 70% of obstetricians surveyed reported that less than 25% of their patients had at least one of the listed psychosocial risk factors. The failure to routinely deliver prenatal care to high psychosocial risk patients may also have contributed to obstetricians' higher referral rate.

Prenatal care providers from all three disciplines preferred to involve alternative clinicians such as social workers, nurses and psychologist/psychiatrists in the delivery of prenatal care services to patients with psychosocial risk factors. FM physicians and midwives preferred a co-managed approach as they preferred to increase prenatal care visits with both an alternative clinician and themselves for all of the six psychosocial risk factors evaluated. In contrast, Ob/Gyns preferred to increase prenatal care visits with only alternative clinicians for patients with unstable housing and lack of paternal involvement and social support. Unstable housing and lack of paternal involvement and social support are risk factors that social workers are trained to manage and which often fall outside of the parameters of obstetric training programs. Prenatal care providers' preference to involving alternative clinicians, such as a social worker, in the delivery of prenatal care to patients with these particular psychosocial risk factors has also been previously reported.[18] Likewise, in a survey of family medicine physicians, providers were asked which psychosocial risk factors were important for them to know during pregnancy. Maternal drug and alcohol abuse, IPV and acceptance of the pregnancy were rated "very important or essential" while mother's education, financial stress and attendance at prenatal care classes were considered less important.[21]

In adjusted analysis of whether provider characteristics were predictive of an increase in prenatal care utilization for patients with psychosocial risk factors, our results indicate that Ob/Gyn providers who had been in practice for less than 10 years were significantly more likely to increase prenatal care utilization with themselves or an alternative clinician. This finding suggests that an emphasis on prenatal care delivery to patients with psychosocial risk factors may have recently gained more importance in Ob/Gyn clinical training programs since the release of the 2006 ACOG guidelines.[8] In contrast, Ob/Gyns and midwives who

spent greater than 75% of their time with patients were significantly less likely to increase the number of prenatal care visits with themselves. An inverse relationship between clinical time and practice patterns suggests that providers who have busy clinical practices may not have additional time available to devote to addressing psychosocial risk factors.

This is the largest national survey to our knowledge that has assessed provider practice patterns regarding prenatal care delivery to high psychosocial risk populations. However, our study must be interpreted in light of certain limitations. Our response rate of 55.8% is consistent with the response rates of other postal surveys of healthcare professionals reported in the literature. In an analysis of 350 postal surveys, the average response rate of doctors was 57.5% (95% CI: 55.2%–59.8%).^[22] However, a proportion of prenatal care providers were not represented in our data sources and our data sources had minimal information regarding survey non-responders. Consequently, although we obtained a random sample of prenatal care providers, our findings may be subject to selection and response bias. Our study also reflects a sample of prenatal care providers who were predominantly private practice clinicians who did not often deliver care to patients with psychosocial risk factors. Therefore, our results may not be generalizable to other prenatal care providers, in other practice structures who frequently deliver care to patients with psychosocial risk factors. In addition, we did not evaluate psychosocial risk factor assessment or screening nor did we evaluate prenatal care content that may address psychosocial risk factors without the need to increase the frequency of prenatal care visits. Provider comfort with addressing psychosocial risk factors, while a factor in referral behavior, does not determine the adequacy of prenatal care as alternative providers may provide more effective prenatal care to patients with psychosocial risk factors. Finally, questions from our survey may have been interpreted differently and not all providers may have been honest in their responses.

The US Public Health Service Expert Panel on the Content of Prenatal Care noted that a “risk-responsive” approach to prenatal care delivery should result in an increase in the number of prenatal care visits and contacts during pregnancy to “identify needs and initiate interventions.”^[23] However, our study suggests that many prenatal care providers may not be comfortable addressing psychosocial risk factors during pregnancy alone and either refer patients to clinicians or facilities outside of their practice or enlist the assistance of an alternative clinician such as a social worker, nurse or psychologist/psychiatrist. These findings suggest that efforts to enhance prenatal care providers’ experience and training with psychosocial risk factors need to be linked to broader efforts to establish coordinated systems of prenatal care delivery that involves multiple providers. Integrating the expertise of social workers, nurses and psychologists with the obstetric expertise of prenatal care providers may improve the efficiency and effectiveness prenatal care delivery to high psychosocial risk patient populations.

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Table 1Prenatal care provider characteristics^{*}

n=2,095	Ob/Gyn n=853	Midwife n=972	Family Medicine n=270	p-value^b
Female	438 (52.0)	957 (99.1)	127 (47.2)	< 0.01
Practice structure				
Private practice	610 (72.2)	523 (54.7)	105 (39.8)	< 0.01
University/Teaching hospital faculty	154 (18.2)	187 (19.5)	109 (41.3)	
Other ^a	81 (9.6)	247 (25.8)	50 (18.9)	
Practice region				
Northeast	184 (21.6)	281 (28.9)	19 (7.0)	< 0.01
Midwest	179 (21.0)	192 (19.8)	110 (40.8)	
South	307 (36.0)	240 (24.7)	56 (20.7)	
West	183 (21.5)	259 (26.7)	85 (31.5)	
# of years since completing clinical training				
< 10	249 (29.5)	303 (31.2)	156 (58.7)	< 0.01
11–20	271 (32.2)	404 (41.7)	62 (23.3)	
> 20	323 (38.3)	263 (27.1)	48 (18.1)	
Time spent in direct contact with patients				
75 %	235 (27.7)	244 (25.4)	93 (34.8)	< 0.01
> 75 %	614 (72.3)	717 (74.6)	174 (65.2)	
Involvement in activities not related to patient care				
Research	78 (9.1)	49 (5.0)	22 (8.2)	< 0.01
Administrative or leadership roles	300 (35.2)	281 (28.9)	119 (44.1)	< 0.01
Teaching fellows, residents or medical students	310 (36.3)	441 (45.4)	145 (53.7)	< 0.01
Other ^a	27 (3.2)	56 (5.8)	9 (3.3)	0.02
Information source regarded as a “very important” way to stay informed about prenatal care guidelines				
Professional organization publications (ACOG, ACNM, AAFP)	705 (83.1)	804 (83.2)	168 (62.9)	<0.01
Continuing education (CME)	591 (70.0)	793 (82.1)	159 (59.8)	<0.01
Print or on-line journals	552 (65.2)	693 (72.0)	152 (57.1)	<0.01
On-line websites	417 (49.8)	570 (59.9)	186 (69.7)	<0.01
Professional meetings	332 (39.9)	548 (57.0)	90 (34.2)	<0.01

^{*} n (% of specialty) unless otherwise specified^a HMO, hospital based practices, government and nonprofit organizations^b chi-square analyses used to determine p-values

Table 2Prenatal care provider psychosocial characteristics^{*}

n=2,095	Ob/Gyn n=853	Midwife n=972	Family Medicine n=270	p-value ^b
% of patients in clinical practice with at least one psychosocial risk factor ^a				
< 25	580 (69.0)	455 (47.3)	129 (48.0)	< 0.01
26–50	138 (16.4)	202 (21.0)	54 (20.1)	
51–75	86 (10.2)	165 (17.2)	54 (20.1)	
> 75	37 (4.4)	140 (14.6)	32 (11.9)	
Provider refers patients with psychosocial risk factors to a clinician/facility outside of clinical practice	505 (59.9)	467 (48.4)	87 (32.2)	< 0.01

^{*} n (% of specialty) unless otherwise specified

^a Psychosocial risk factors listed included: age < 19, unstable housing, lack of paternal involvement/social support, late prenatal care (> 13 weeks at first visit), intimate partner violence, drug or alcohol use during pregnancy

^b chi-square analyses used to determine p-values

Table 3

Proportion of prenatal care providers who would increase prenatal care utilization with aprenatal care provider compared to an alternative clinician by psychosocial risk factor*

N=2,095	Ob/Gyn				p-value ^e
	Prenatal care provider only ^a	Alternative clinician only ^b	Both ^c	Neither ^d	
Drug or alcohol use	27 (3.4)	100 (12.4)	643 (80.0)	34 (4.2)	<0.01
Intimate partner violence	18 (2.2)	129 (16.1)	614 (76.5)	42 (5.2)	<0.01
Age 19	32 (4.0)	297 (36.9)	321 (39.9)	155 (19.3)	<0.01
Unstable housing	12 (1.5)	373 (46.5)	333 (41.5)	84 (10.5)	<0.01
Lack of paternal involvement/social support	16 (2.0)	355 (44.3)	316 (39.5)	114 (14.2)	<0.01
Late prenatal care (> 13 weeks at first visit)	74 (9.2)	174 (21.7)	246 (30.6)	309 (38.5)	<0.01
Midwife					
	Prenatal care provider only ^a	Alternative clinician only ^b	Both ^c	Neither ^d	p-value ^e
Drug or alcohol use	36 (4.0)	90 (9.9)	749 (82.2)	36 (4.0)	<0.01
Intimate partner violence	38 (4.2)	120 (13.1)	723 (79.2)	32 (3.5)	<0.01
Age 19	60 (6.6)	285 (31.4)	419 (46.1)	145 (16.0)	<0.01
Unstable housing	27 (3.0)	396 (43.6)	412 (45.3)	74 (8.1)	<0.01
Lack of paternal involvement/social support	41 (4.5)	320 (35.3)	447 (49.3)	98 (10.8)	<0.01
Late prenatal care (> 13 weeks at first visit)	110 (12.2)	150 (16.6)	236 (26.1)	409 (45.2)	<0.01
Family Practice					
	Prenatal care provider only ^a	Alternative clinician only ^b	Both ^c	Neither ^d	p-value ^e
Drug or alcohol use	10 (3.8)	21 (7.9)	228 (85.7)	7 (2.6)	<0.01
Intimate partner violence	10 (1.9)	26 (9.8)	225 (84.6)	5 (1.9)	<0.01
Age 19	12 (4.5)	67 (25.3)	154 (58.1)	32 (12.1)	<0.01
Unstable housing	10 (3.8)	82 (30.8)	158 (59.4)	16 (6.0)	<0.01
Lack of paternal involvement/social support	12 (4.5)	81 (30.3)	144 (53.9)	30 (11.2)	<0.01
Late prenatal care (> 13 weeks at first visit)	33 (12.3)	46 (17.1)	101 (37.5)	89 (33.1)	<0.01

*
n (%) unless otherwise specified
a Prenatal care provider defined as a physician or midwife
b Alternative clinician defined as social worker, nurse (LPN, RN, PA, NP) or psychologist/psychiatrist
c Providers responded that they would increase utilization with both themselves and an alternative clinician
d Providers responded that they would not increase utilization with either themselves or an alternative clinician
e chi-square analyses used to determine p-values

Table 4
Adjusted odds of increasing prenatal care utilization for high psychosocial risk pregnancies by specialty

Characteristic	Ob/Gyn OR (95% CI) ^e		Midwife OR (95% CI) ^e		Family Medicine OR (95% CI) ^e	
	Prenatal care provider ^a	Alternative clinician ^b	Prenatal care provider ^a	Alternative clinician ^b	Prenatal care provider ^a	Alternative clinician ^b
Female	1.13 (0.71–1.79)	1.31 (0.79–2.19)	1.78 (0.21–15.49)	1.07 (0.13–8.95)	2.53 (0.64–9.99)	8.26 (1.74–39.30)^c
Practice structure						
Private practice	ref	ref	ref	ref	ref	ref
University/Teaching hospital faculty	0.73 (0.39–1.35)	1.41 (0.65–3.07)	1.82 (0.77–4.30)	1.25 (0.71–2.20)	0.50 (0.09–2.56)	1.41 (0.36–5.54)
HMO/hospital based/Govt/other	1.03 (0.48–2.24)	2.07 (0.71–6.00)	1.11 (0.58–2.11)	1.94 (1.09–3.45)^c	1.39 (0.13–14.4)	1.76 (0.32–9.67)
Practice region						
Northeast	0.88 (0.46–1.67)	1.95 (0.89–4.27)	1.12 (0.49–2.56)	0.89 (0.48–1.64)	<i>d</i>	<i>d</i>
Midwest	ref	ref	ref	ref	<i>d</i>	<i>d</i>
South	1.09 (0.60–1.98)	0.86 (0.48–1.55)	0.74 (0.34–1.63)	0.86 (0.46–1.62)	<i>d</i>	<i>d</i>
West	0.86 (0.45–1.65)	1.39 (0.68–2.87)	0.83 (0.38–1.81)	0.93 (0.50–1.74)	<i>d</i>	<i>d</i>
# of years since clinical training						
< 10	2.15 (1.14–4.05)^c	2.27 (1.00–4.67)^c	1.40 (0.76–2.58)	1.02 (0.63–1.67)	0.34 (0.04–3.00)	0.44 (0.09–2.28)
11–20	ref	ref	ref	ref	ref	ref
> 20	0.98 (0.60–1.60)	0.99 (0.59–1.69)	1.61 (0.80–3.21)	0.92 (0.55–1.52)	0.86 (0.05–14.59)	0.39 (0.07–2.25)
% time spent in direct contact with patients						
> 75	0.55 (0.32–0.94)^c	1.07 (0.63–1.81)	0.21 (0.08–0.59)^c	0.96 (0.59–1.56)	0.89 (0.21–3.73)	1.41 (0.39–4.97)
% of patients in clinical practice with at least one psychosocial risk factor ^d						
< 25	ref	ref	ref	ref	ref	ref
26–50	0.78 (0.44–1.38)	0.92 (0.48–1.74)	1.87 (0.80–4.39)	1.35 (0.75–2.41)	1.68 (0.17–16.19)	0.64 (0.17–2.51)
51–75	0.83 (0.39–1.74)	1.62 (0.61–4.30)	1.12 (0.52–2.39)	1.13 (0.62–2.07)	0.40 (0.09–1.79)	0.45 (0.11–1.80)
> 75	1.61 (0.36–7.19)	1.30 (0.29–5.91)	0.63 (0.31–1.32)	0.78 (0.42–1.46)	0.48 (0.07–3.26)	0.34 (0.54–2.13)

^a Prenatal care provider defined as a physician or midwife

^b Alternative clinician defined as social worker, nurse (LPN, RN, PA, NP) or psychologist/psychiatrist

c $p < 0.05$

d Unable to calculate due to small cell size

e Logistic regression analyses used to determine odds ratios and confidence intervals