

Assessing Perception of Prenatal Care Quality Among Black Women in the United States

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Introduction: There has been little attention to measuring quality of prenatal care from a Black person's perspective. We examined validity and reliability of the Quality of Prenatal Care Questionnaire (QPCQ) and perceptions of the quality of prenatal care among pregnant Black women.

Methods: A total of 190 women had complete data on the postpartum questionnaire containing the QPCQ within 8 weeks after birth. Internal consistency reliability was assessed using Cronbach's α . Construct validity was assessed through hypothesis testing using select questions from the Pregnancy Risk Assessment Monitoring System (PRAMS) and Pearson's r correlation.

Results: The mean (SD) maternal age was 26.5 (5.5) years, and 85.3% of births were term (>37 weeks' 0 days' gestation). The total mean (SD) QPCQ score was 191.3 (27.9) points (range 46–230), and the mean (SD) item score for the subscales ranged from 3.88 (0.80) points to 4.27 (0.64). The Cronbach's α for the overall QPCQ score was .97 and ranged from .72 to .96 for the 6 subscale scores, which indicated acceptable internal consistency reliability. All but one subscale had a Cronbach's α higher than .80. The Approachability subscale had a Cronbach's α of .72. Construct validity demonstrated a moderate and significant positive correlation between the PRAMS items and the QPCQ ($r = .273, P < .001$).

Discussion: To our knowledge, this is the first study to examine the validity and reliability of the QPCQ and perceptions of quality of prenatal care among Black women from the United States. The results indicate that participants rate the quality of their prenatal care highly and that the QPCQ is a reliable and valid measure of the quality of prenatal care. Use of a convenient and reliable instrument to measure the quality of prenatal care rather than prenatal care satisfaction or utilization may help to elucidate the factors of prenatal care that are protective specifically among Black women.

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INTRODUCTION

In the United States, Black women are 1.5 times more likely than non-Hispanic white women to have preterm birth (<37 completed weeks' gestation) (14.1% and 9.1%, respectively)¹ and 3 to 4 times more likely than non-Hispanic white women to die during pregnancy and within the first year postpartum.²

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Inadequate prenatal care, defined as all prenatal care that begins after the fourth month of pregnancy as well as prenatal care that includes less than 50% of the recommended number of visits,³ is associated with an increased risk of preterm birth and maternal mortality.^{4,5} Receipt of prenatal care has long been known to be associated with lower rates of preterm births in all racial and ethnic groups⁴ and may be a factor in racial disparities in pregnancy outcomes.^{6–8}

Efforts over the past 40 years to expand access to and early initiation of prenatal care⁹ have been successful in increasing the number of visits, yet they have failed to create equity in pregnancy and maternal health outcomes.^{6–8} Black women are more likely to initiate prenatal care later (after the first trimester, or >13 weeks' gestation) compared with non-Hispanic white women.^{4,10,11} Racial and cultural differences with regard to values, attitudes, preferences, and experiences may affect care that is accepted or received.¹² Underuse of prenatal care among Black women has been associated with health care mistrust and beliefs,¹³ perceived discrimination,^{14–17} and unsatisfactory clinical experiences.^{13,15,17} This article presents the results of a psychometric evaluation of the Quality of Prenatal Care Questionnaire (QPCQ) to determine validity and reliability for use by Black women.

Measurement of the quality of prenatal care has relied heavily on assessment of the timing of initiation and the total number of prenatal visits.¹⁸ Beyond timing of utilization and counting visits, there has been little attention to



Quick Points

- ◆ This is the first study to report the validity and reliability of the Quality of Prenatal Care Questionnaire (QPCQ) among Black postpartum women, as well as women's perceptions of the quality of prenatal care.
- ◆ The QPCQ is a quick, convenient, valid, and reliable instrument that can be used to measure the quality of prenatal care in the outpatient setting.
- ◆ Health care provider use of the QPCQ may help clarify the factors of prenatal care that are protective among Black women and can lead to targeted interventions.

the quality of prenatal care from the perspective of persons who receive such care. More recent research has emphasized the importance of high-quality health care as an important component to reducing racial disparities in other areas of health.^{6,19} Assessment of quality has also been based primarily on women's satisfaction, which is a distinctly different construct from quality of care.^{20,21} Quality of prenatal care has been evaluated using focus groups,^{22–24} audit indicators,²⁵ checklists, observations, and exit interviews,²⁶ or one-dimensional instruments.²⁷ However, these measures do not assess women's perceptions of quality, an important and overlooked component, and there has been no instrument that directly measures their perceptions until recently.

Heaman and colleagues,²⁸ a group of Canadian nurse researchers, saw a need to develop a theoretically grounded measure of prenatal care quality that was distinct from satisfaction measures in order to better evaluate the relationship between the quality of prenatal care and pregnancy outcomes. The QPCQ is based on Donabedian's model of quality care, which considers the influence of the health care system structure and the prenatal care provider's technical and interpersonal performances as indicators of quality on pregnancy outcomes.²⁹ Final question items of the instrument specifically include questions that address provider–patient communication, patient autonomy and respect, and information sharing: factors that all women, including Black women, consider important during the patient encounter.¹⁵ The QPCQ was developed, tested, and validated in a sample of 80 health care providers, 80 pregnant women, and 844 postpartum women from Canada,²⁸ and was later validated with 299 postpartum women from Australia.³⁰ Recently, it was used to assess pregnant and postpartum women's perceptions of access and quality of prenatal care in the United Kingdom.³¹ However, to date, there are no publications about the utility and reliability of the QPCQ among US pregnant women, much less in Black women. The purpose of this study was to determine the internal consistency reliability and the validity of the QPCQ and to explore women's perceptions of quality of prenatal care in a subsample of participants enrolled in an ongoing longitudinal mixed-methods study among pregnant Black women who reside in the United States.

METHODS

Study Overview and Participants

The data reported here were collected as part of the Biosocial Impact on Black Births (BIBB) study. BIBB is a prospective study that examines the association of social stressors with

preterm birth among pregnant Black women. The BIBB study research design has been reported elsewhere.³² In brief, this is a mixed-methods, longitudinal cohort study of Black pregnant women receiving care at prenatal clinic sites in Detroit, MI, and Columbus, OH. The clinics are staffed by obstetrics and gynecology residents and certified nurse-midwives. The study was approved by the institutional review board of the participating universities and clinical sites. Women were included in the study if they self-identified as being African American or Black, were 18 to 45 years of age, between 8 to 29 weeks' gestation, had singleton pregnancies, and could read or write in English. Eligible women were approached by the research staff about the study and were invited to participate. Women who agreed to participate completed an informed consent process. Participants were required to complete 2 or 3 electronic prenatal questionnaires during their pregnancy and optionally complete an electronic postpartum questionnaire that contained the QPCQ. The participants received a gift card to a major retail store for each completed questionnaire (\$30 each prenatal, \$25 postpartum) in appreciation of their time.

The questionnaires were created and distributed using Qualtrics XM Survey Software, a web-based data platform for creating online surveys. Password-protected, customer-controlled survey data were captured in real time and stored in Qualtrics' secure and Transport Layer Security–encrypted servers. Sociodemographic characteristics of the subsample were obtained from self-reported survey data, and birth data were obtained from health record abstractions.

QPCQ Instrument

The details of the developmental phase and initial testing of the QPCQ on the Canadian sample are described by Heaman et al,²⁸ and the methods are summarized here. The preliminary, 100-item QPCQ was reduced to a final 46 items by exploratory factor analysis.²⁸ Example items include the following: "I was always given honest answers to my questions," "My prenatal care provider respected me," and "My concerns were taken seriously." Each item has a 5-point Likert scale (1 = "strongly disagree" to 5 = "strongly agree"), with 5 negatively phrased items such as, "I was afraid to ask my prenatal provider(s) questions," reverse scored. The total score range is 46 to 230 with a higher score indicating higher quality of prenatal care. The instrument includes 6 subscales: *Information Sharing* (9 items, score range 9–45), *Anticipatory Guidance* (11 items, score range 11–55), *Sufficient Time* (5 items, score range 5–25), *Approachability* (4 items, score range 4–20), *Availability*

(5 items, score range 5-25), and *Support and Respect* (12 items, score range 12-60). The 46 items were administered to women postpartum and analyzed to evaluate construct validity, internal consistency, and test-retest reliability.²⁸ Construct validity was assessed by Heamen et al²⁸ using a hypothesis-testing approach with the Patient Expectations and Satisfaction with Prenatal Care (PESPC) instrument. It was hypothesized that women who rated their quality of prenatal care higher would have higher rating of satisfaction. Quality of prenatal care scores were positively related to women's ratings of satisfaction with care (PESPC; $r = 0.81$). The overall QPCQ and its subscales had acceptable internal consistency reliabilities (Cronbach's $\alpha = .96$ for total scale and .73-.93 for subscales, respectively). The test-retest reliability on repeat administration approximately one week later was stable (intraclass correlation coefficient = 0.88).

Pregnancy Risk Assessment Monitoring System Instrument

The Pregnancy Risk Assessment Monitoring System (PRAMS) is a surveillance project developed by the US Centers for Disease Control and Prevention to provide data for state, territorial, or local health officials to improve the health of women and their infants.³³ PRAMS collects questions 2 to 3 months postpartum from a sample of women drawn from the jurisdiction's birth certificate file who recently had a live birth. The PRAMS uses a standardized approach to data collection, consisting of mandatory "Core" questions and optional "Standard" questions. Each data collection site has the choice to use the optional standard questions to tailor the needs of the jurisdiction. The questionnaire addresses topics such as barriers to and content of prenatal care, prenatal and birth history, maternal use of alcohol and cigarettes, physical abuse, contraception, economic status, maternal stress, and early infant development and health status. Investigators have used birth certificate data to validate selected PRAMS questions on health history.^{34,35} We used a subset of 10 questions from the PRAMS Phase 8 Standard Questions,³⁶ specifically item R22, Phase 7 Core #19 (Appendix 1) in our postpartum questionnaire to measure communication and information sharing during the prenatal period. The selected questions assess if the health care provider discussed smoking, breastfeeding, drinking alcohol, seatbelt use, safe medicines, illegal drug use, screening tests for birth defects, preterm labor signs and symptoms, and actions to take for depression and physical abuse during any of the participants' prenatal visits. Although the Core #19 question set has not yet been validated by other investigators, it was chosen because women value positive patient-provider communication during the prenatal visit,^{17,22,37} an indicator of prenatal care quality,²⁹ and it complements questions related to patient-provider communication in the QPCQ. PRAMS survey participants are asked to count only discussions in answering the question stem, "During any of your prenatal care visits, did a doctor, nurse, or other health care worker talk with you about any of the things listed below?" Participants are asked only to count discussions and not reading materials or videos. Example items include "Breastfeeding my baby," "The signs and symptoms of preterm labor," and "What to do if I feel depressed during my

pregnancy or after my baby is born." Participants answered "No" if no one talked to them about it or "Yes" if someone did. The number of "yes" answers are summed, and the total score can range from 0 to 10. A score of 0 indicates that none of the topics were discussed with the health care provider prenatally, and a score of 10 indicates that all topics were discussed.

Reliability

Both the reliability and validity of the QPCQ were assessed. Reliability is a measurement of consistency, or the ability of a measure or instrument to consistently reflect the construct that it is supposed to measure.³⁸ A construct is a group of interrelated variables being studied. Reliability is determined either using a test-retest approach (test-retest reliability), with the expectation that a person's overall score on an instrument would be similar if the instrument were taken at another time for constructs expected to be stable, or it is determined based on the average correlation among items within a test (internal consistency reliability). Cronbach's alpha coefficient (α) is the most common measure of reliability and is used to measure the overall reliability of a total scale and its subscale items. Reliability analysis consists of results that determine the reliability, interitem correlation, and items to drop to improve the overall reliability. Cronbach's α values range from 0 to 1, and values greater than .70 indicate acceptable scale reliability.³⁹ Item-total correlation results, or how well each item correlates with the total scale, with values less than 0.3 indicate that a particular item does not correlate with the overall score from the scale. Listwise deletion results of Cronbach's α indicate whether removing an item will improve or increase the overall reliability.³⁸

Validity

Validity, or accuracy, is defined as whether an instrument is measuring what it is designed to measure. There are many types of validity; however, we focused on construct validity for this study. Construct validity is the extent to which an instrument measures the theoretical construct it is intended to measure. A type of construct validity is convergent validity, which tests the strength of the statistical relationship of whether 2 measurements are testing the same concept (or construct) under different instruments.^{40,41} Pearson's correlation coefficient (r) is a standardized measure used to check for model validity by finding the strength and linear relationship between 2 continuous variables (total scores for both instruments). It has a range of -1 to 1 . A coefficient of 1 indicates a perfect positive correlation, meaning that as one variable increases, the other increases by a proportionate amount. A coefficient of -1 indicates a perfect negative correlation, meaning that if one variable increases, the other decreases by a proportionate amount. A coefficient of 0 indicates no correlation. Pearson's r is commonly used to measure the size of an observed effect, or the effect size. Values of 0.1 or greater represent a small effect, 0.2 or greater a medium effect, and 0.3 or greater a large effect.⁴²

Linear regression analysis estimates parameters in a linear equation that can be used to predict values of one variable (independent variable) based on another (dependent variable).

A linear regression analysis includes a Pearson's correlation coefficient analysis.^{38,43} Pearson's *r* squared (the coefficient of determination, *R*²) is a measure of the amount of variability in one variable that is shared by the others.³⁸ For example, survey scores vary among participants because of a variety of factors, including the relevance of the questions to the participant, timing of the questionnaire, and the mood of the person.

Statistical Analysis

BIBB study survey data were transferred into the SPSS 25 software (IBM Corporation) for statistical analysis. Descriptive statistics (mean, SD, frequency) were used to analyze the sociodemographic characteristics and the QPCQ subscales. The subscale mean scores were calculated by reverse-scoring the required items, adding the total for each item, and dividing by the total sum by the number of items in the subscale.

Internal consistency reliability of the QPCQ and each of its 6 subscales was determined using Cronbach's α with listwise deletion. Cronbach's α greater than .70 and interitem correlation coefficients above 0.30 were considered acceptable.^{38,39,44} Construct validity was assessed using a hypothesis-testing approach. We hypothesized that women who rated their quality of the prenatal care higher had more discussions with their provider about the PRAMS topics than women who did not rate their prenatal care higher, and that a higher PRAMS score is associated with a higher QPCQ score. A scatterplot analysis to demonstrate the relationship between the total QPCQ score and the 10-question PRAMS score was performed. A linear relationship is required to use the Pearson's *r* correlation coefficient. To measure construct validity, a simple linear regression analysis to determine Pearson's *r* was performed, with the total QPCQ score as the dependent variable and the total 10-question PRAMS score as the independent variable. Bias corrected and accelerated bootstrap 95% CIs were computed within the linear regression analysis to derive intervals from the actual data and to ensure accuracy even when the sampling distribution of *r* was not normal.³⁸

RESULTS

Between June 2018 and May 2020, 426 participants gave birth. Of those, 333 participants agreed to be contacted about taking the postpartum survey after giving birth and were emailed a survey link 4 weeks after birth, with the instructions to complete the postpartum questionnaire within 8 weeks after birth. A total of 203 completed the postpartum survey, and a subsample of 190 women had complete data on the QPCQ and were included in these analyses.

Demographic characteristics of the 190 participants are presented in Table 1. The mean maternal age was 26.6 years, and the majority of births were term (*n* = 151, 85.3%). Most of the participants were multiparous (*n* = 137, 72%), reported Medicaid as their primary insurance (132, 71%), had a high school or less education (107, 57%), and lived in Michigan (107, 56%). Approximately 45% had a household annual income of less than \$10,000.

The mean (SD) total score for the full 46-item QPCQ was 191.3 (27), indicating that women rated their care as good (total scores >70%); the mean (SD) item score was 4.16 (0.3),

Table 1. Demographic Characteristics of Women Who Completed the Quality of Prenatal Care Questionnaire (N = 190)

Characteristics	Value
Maternal age at enrollment, mean (SD), y	26.5 (5.5)
Location, n (%)	
Michigan	107 (56.3)
Ohio	83 (43.7)
Highest level of education, n (%)^a	
Less than high school	31 (16.5)
High school to GED	76 (40.4)
Technical or vocational training	21 (11.2)
Some college or higher	60 (31.9)
Relationship status, n (%)^b	
Married to FOB	19 (10.2)
Living with FOB	60 (32.1)
Involved with FOB	68 (36.4)
Separated	1 (0.5)
Never married, not involved with FOB	39 (20.9)
Insurance, n (%)^c	
Medicaid	132 (71.4)
Medicare	17 (9.2)
Medicare and Medicaid	10 (5.4)
Private or employee	11 (5.9)
Private and Medicaid	6 (3.2)
Self-pay	1 (0.5)
Don't know or other	5 (2.7)
Employment status, n (%)^a	
Employed	88 (46.8)
Unemployed, laid off, or looking for work	62 (33.0)
Not looking for work or homemaker	29 (15.4)
Full time student	4 (2.1)
Medical leave	5 (2.7)
Household income/y, n (%)^c	
<\$10,000	84 (45.4)
\$10,000-\$19,999	28 (15.1)
\$20,000-\$29,999	34 (18.4)
\$30,000-\$39,999	25 (13.5)
>\$40,000	14 (7.5)
Gestational age at birth, mean (SD),^d wk	38.2 (2.1)
Parity	
Primiparous	53 (27.9)
Multiparous	137 (72.1)
Birth outcome	
Term ^e	151 (85.3)
Preterm ^f	26 (14.7)

Abbreviations: FOB, father of the baby; GED, General Educational Development.

^a*n* = 188 because of missing data.

^b*n* = 187 because of missing data.

^c*n* = 185 because of missing data.

^d*n* = 177 because of missing data.

^eTerm = greater than 37 weeks' 0 days' gestation.

^fPreterm = less than 36 weeks' 6 days' gestation.

Table 2. Reliability: QPCQ Descriptive Statistics, Mean, and Cronbach's α (N = 190)

Subscale ²⁵	Items	Score Range	Total Score Mean (SD) ^a	Item Score Mean (SD)	Cronbach's α	Description
Information Sharing	9	9-45	38.40 (5.73)	4.27 (0.64)	.92	How prenatal care providers answer questions, keep information confidential, and ensure women understand reasons for tests and their results
Anticipatory Guidance	11	11-55	44.49 (7.85)	4.05 (0.71)	.90	How prenatal care providers provide women enough information to make decisions about their prenatal care and give women options for their birth experience
Sufficient Time	5	5-25	20.73 (3.34)	4.15 (0.67)	.81	How prenatal care providers spend time addressing women's questions and the time spent in an appointment
Approachability	4	4-20	15.53 (3.19)	3.88 (0.80)	.72	How approachable the health care provider is (eg, woman was afraid to ask questions, felt like she was wasting the prenatal care providers' time)
Availability	5	5-25	21.00 (3.52)	4.20 (0.70)	.89	How to contact the prenatal care providers and how available the clinic/office staff or prenatal care providers are to respond to questions, concerns, or needs
Support and Respect	12	12-60	51.19 (7.73)	4.27 (0.64)	.96	How prenatal care providers respect and support women in regard to their concerns and decisions
Total QPCQ	46	46-230	191.3 (27.9)	4.16 (0.32)	.97	

Abbreviation: QPCQ, Quality of Prenatal Care Questionnaire.
Source: Heaman et al.²⁸

indicating that the majority of participants answered “agree” or “strongly agree” to most items (frequencies not shown). Details of each of the subscales are found in Table 2. The mean (SD) item score for the subscales ranged from 3.88 (0.80) to 4.27 (0.64) points with very little intrafactor mean variation. The Information Sharing and Support and Respect subscales had the highest mean (SD) item score, 4.27 (0.64) points, and the Approachability subscale had the lowest mean (SD) item score, 3.88 (0.80) points (Table 2). The mean (SD) total score

of the PRAMS was 8.1 (2.4) points (range, 0-10), with 69% of the participants with a score of 8 or higher, indicating that 8 of the 10 items were discussed by their health care provider during the prenatal visits.

Overall, the QPCQ (Cronbach's α = .97) and the 6 subscales (Cronbach's α ranging from .72 to .96) had acceptable internal consistency reliability. Cronbach's α exceeded .80 except for the Approachability subscale with an α of .72 (Table 2). The corrected item–total correlations were above 0.3,

indicating good correlations among items and that all items correlated to the total score (not shown). The item “My prenatal care provider(s) was abrupt with me” of the Approachability subscale had a low item–total correlation of 0.28, indicating that it does not correlate well with the subscale because it was below the value of 0.3. The Cronbach’s α would increase from .72 to .80 if the item were removed, indicating that deletion will improve the reliability of the Approachability subscale.

Results of the construct validity analysis using a simple linear regression showed a positive linear relationship through the scatter plot analysis and a medium but significant correlation between the total 10-item PRAMS score and the total 46-item QPCQ total score ($r = 0.273$; 95% CI, 0.085–0.428; $P < .001$). Although Pearson’s correlation of 0.273 indicated a medium correlation, it provided adequate support for construct, or more specifically, convergent validity. The confidence intervals did not cross 0, indicating that there is 95% chance that there is a genuine positive effect; as the PRAMS score increases, the QPCQ score increases. The results further illustrate that for every one-point increase (representing the equivalent of an additional topic discussed in care) in the PRAMS score, the participant’s QPCQ score increased 3.11 points. The coefficient of determination, R^2 , was 0.075, meaning that the PRAMS score shares 7.5% of the variability in the QPCQ score. This indicates that 92.5% of the variability can be accounted for by other variables in the postpartum survey or other unmeasured factors that affect score performance.

DISCUSSION

This is the first study to report the psychometric evaluation of the QPCQ to determine its the reliability and validity, as well as perceptions of prenatal care quality among Black women living in the United States. Our results indicate that quality of prenatal care was rated highly (mean 191.3) and that the QPCQ (Cronbach’s $\alpha = .97$) and its subscales (Cronbach’s $\alpha = .72$ –.96) had acceptable internal consistency reliability and support construct validity ($r = 0.273$) among postpartum, Black women with low income.

Our results had some similarities and differences to the published findings by Heaman et al and Sword et al in samples of pregnant and postpartum women from Canada and Australia, respectively.^{28,30} The Cronbach’s α in our sample for the overall QPCQ of .97 was very high and similar to that demonstrated in the Canadian (Cronbach’s $\alpha = .96$) and Australian (Cronbach’s $\alpha = .97$) samples. The 6 subscales also showed satisfactory internal consistency reliability ($\alpha = .72$ –.96), similar to that of the Canadian (Cronbach’s $\alpha = .73$ –.93) and the Australian (Cronbach’s $\alpha = .74$ –.95) samples. The Cronbach’s α that exceeds .90 suggests that there may be redundant items and that the scale could successfully be shortened and still represent the constructs.^{39,44} Identifying the redundant items is beyond the scope of this article; however, shortening this 46-item scale is important to consider regarding participant’s burden in quality improvement projects and research studies.

In this study, the Approachability subscale had the lowest Cronbach’s α of .72 of all 6 subscales and the only one below .80. This may be due, in part, to the very small number of items (4) in this scale. However, Cronbach’s α values in the range of .70 to .80 indicate acceptable scale reliability.³⁸ The Approach-

ability subscale also had the lowest average mean (SD) score, 3.88 (0.80). There was a low item–total correlation of 0.28 with the subscale item, “My prenatal care provider was abrupt with me,” and removing it would increase the Cronbach’s α from .72 to .80. A low corrected item–total correlation was also seen in the results of the Australian (0.46)³⁰ sample, but potentially removing the item did not estimate an increase in the Cronbach’s α , indicating this question correlated well with the scale tested on their participants.

The lower Cronbach’s α for the Approachability subscale could be reflective of cultural and/or social economic experiences with health care. All our participants were Black women, and the majority had annual incomes of less than \$30,000, a high school or less level of education, and were insured by Medicaid. The majority of women from the Canadian samples were white, and a very small percentage were Black women (3.1%, 0.9%, and 1.3%).²⁸ Racial or ethnic demographic characteristics of the participant were not presented in the Australian sample.³⁰ Additionally, the participants in both the Canadian and the Australian samples had public health insurance but also had higher incomes and a higher level of educational achievement than the women in our study.^{28,30} All Canadian and Australian citizens and permanent residents are covered by government-backed health care, regardless of income.^{45,46} This is in contrast to Medicaid, the government-funded health care program in the United States, which insures eligible low-income pregnant women within 200% and 205% of the federal poverty level in Michigan and Ohio, respectively, during the time of enrollment.⁴⁷ Therefore, the expectations and perceptions of what it means to be rushed, abrupt, or wasting time may be different between participants in our study and the participants from Canada and Australia depending on cultural norms and experiences of discrimination due to income and race.^{17,37,48} The differences in reliability might also be influenced by the type and level of experience of the health care provider. Our participants received care in obstetrics and gynecology outpatient clinics, in which the providers consisted of nurse-midwives and mostly of resident physicians in training overseen by experienced attending physicians. In this academic setting, prenatal visits are designed to be longer because of meetings with nurses and other clinic staff during visits, but patient interactions with physicians may be perceived as being more abrupt. In the 2 other studies,^{28,30} prenatal care was provided by obstetricians, family physicians, general practitioners, nurse-midwives, or nurse practitioners, who may have been perceived as less hurried and more approachable.

Unlike Heaman and Sword, who used PESPC, a valid and reliable instrument, to access construct validity for the QPCQ,^{28,30} we used the 10-item PRAMS Phase 8 questions³⁶ for validation. Although investigators have used birth certificate data to validate selected PRAMS questions on health history,^{34,35} there are no published studies about the use of these questions for a validation analysis. The PRAMS questions, however, measure the constructs of health care provider communication and information sharing, similar to some questions (or constructs) in the QPCQ. Pearson’s r showed a positive correlation between the total PRAMS score and the total QPCQ score ($r = 0.273$, $P < .001$), indicating a medium effect size. A low R^2 value (0.075) indicating the PRAMS score

shared 7.5% of the variation in the QPCQ score is to be expected given that the incongruity between the 2 instruments and other questions in the postpartum questionnaire as well as unmeasured factors (time of the day, mood of the participant) could account for the remainder 92.5% variation.

Implications

The QPCQ has broad implications for outpatient settings. Quality improvement projects could use the QPCQ to identify unmet patient needs and to improve communication practices between health care providers and their patients.¹⁷ The QPCQ can also be used to identify disparities in perceptions of prenatal care quality among patients of various races or ethnicities, socioeconomic backgrounds, and health statuses. The tool may help health care providers develop tailored, patient-centered prenatal care to enhance the visit experience and improve maternal health.

Use of a convenient, valid, and reliable instrument like the QPCQ to measure the quality of prenatal care rather than prenatal care satisfaction or utilization has the potential to elucidate the factors of prenatal care that are protective specifically among Black women, the population at highest risk for adverse maternal (eg, morbidity and mortality) and neonatal (eg, preterm birth) health outcomes. Other perinatal outcomes may be influenced by prenatal quality and could be measured, such as perceived prenatal care provider bias and racism, maternal mental health, connections to social services, maternal self-esteem, and the health of the postpartum woman and her infant. These perinatal outcomes are universal to pregnant women regardless of country of residence. For example, Brislane et al³¹ conducted a mixed-methods study in the United Kingdom during the coronavirus 2019 (COVID-19) pandemic and determined that a low QPCQ score was associated with disruption of prenatal care services and changes to delivery mode and that a high QPCQ score was associated with higher self-rated health. The study revealed that women would benefit from guidance on birth options, COVID-19 risks and safety, general pregnancy-related information, and coping with postpartum loneliness.³¹

More knowledge about the quality of prenatal care could lead to targeted interventions and resources to ultimately improve maternal and child health among Black families. The investment in ensuring access to prenatal care in the United States may need to pivot to embrace assurance of quality alongside quantity. Utilization of high-quality prenatal care may produce the long expected, but not realized, reductions in maternal and infant morbidity and mortality.

Limitations

This study has a few limitations. Our sample included 190 women from Detroit, MI, and Columbus, OH, metropolitan areas. Future research could examine the reliability of QPCQ among a large and more sociodemographically diverse sample of Black women. The results of our study cannot be generalized for women of other races or ethnicities, women from rural areas, women from other countries, or women receiving prenatal care in different health care settings. Future research about quality of prenatal care measures should include women

who receive care from a diverse group of providers including advanced practice nurses (eg, certified nurse-midwives, nurse practitioners), maternal-fetal medicine physicians, and family medicine physicians. This instrument was convenient to administer, especially when other models of assessing quality of care in clinical settings, such as group visits and focus groups, are not feasible and may not fit neatly in clinical settings designed for individual care.^{49,50} The high Cronbach's α values for some subscales also suggest that we may be able to shorten some of these subscales. Although there was a significant correlation between the PRAMS questions and QPCQ, the R^2 value was low. Further assessment of construct validity may be warranted in future studies that use a repeated measures design to assess the QPCQ.

CONCLUSION

The QPCQ is a reliable and valid measure that can be used to assess patients' perceptions of quality of prenatal care. The use of this instrument, together with other assessments, will aid health care providers and researchers in obtaining a comprehensive assessment of prenatal care and in the improvement of prenatal care delivery. We recommend that the future assessment of the reliability and validity in target populations consider the removal of one item in the Approachability subscale to improve its reliability and consider shortening the subscales by reducing the total number of instrument items, specifically in subscales with high Cronbach α values, to reduce participant burden.

CONFLICT OF INTEREST

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Appendix 1: Pregnancy Risk Assessment Monitoring System Questions

During any of your prenatal care visits, did a doctor, nurse, or other health care worker talk with you about any of the things listed below? Please count only discussions, not reading materials or videos. For each item, check No if no one talked with you about it or Yes if someone did.

	No	Yes
a. How smoking during pregnancy could affect my baby	☐	☐
b. Breastfeeding my baby	☐	☐
c. How drinking alcohol during pregnancy could affect my baby	☐	☐
d. Using a seat belt during my pregnancy	☐	☐
e. Medicines that are safe to take during my pregnancy	☐	☐
f. How using illegal drugs could affect my baby	☐	☐
g. Doing tests to screen for birth defects or diseases that run in my family	☐	☐
h. The signs and symptoms of preterm labor (labor more than 3 weeks before the baby is due)	☐	☐
i. What to do if I feel depressed during my pregnancy or after my baby is born	☐	☐
j. Physical abuse to women by their husbands or partners	☐	☐

Source: Pregnancy Risk Assessment Monitoring System Phase 8, item R22 (Phase 7 Core #19).³⁶