



Maternal Health

Adaptation of the Person-Centered Maternity Care Scale in the United States: Prioritizing the Experiences of Black Women and Birthing People



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ABSTRACT

Introduction: Mistreatment by health care providers disproportionately affects Black, Indigenous, and other people of color in the United States. The goal of this study is to adapt the global Person-Centered Maternity Care (PCMC) scale for use in the United States, with particular attention to the experiences of Black women and birthing people.

Methods: We used a community-engaged approach including expert reviews and cognitive interviews to assess content validity, relevance, comprehension, and comprehensiveness of the PCMC items. Surveys of 297 postpartum people, 82% of whom identified as Black, were used for psychometric analysis in which we assessed construct and criterion validity and reliability. The University of California, San Francisco California Preterm Birth Initiative's Community Advisory Board, which consists of community members, community-based health workers, and social service providers in Northern California, provided input during all stages of the project.

Results: Through an iterative process of factor analysis, discussions with the Community Advisory Board, and a prioritization survey, we eliminated items that performed poorly in psychometric analysis, yielding a 35-item PCMC-U.S. scale with subscales for dignity and respect, communication and autonomy, and responsive and supportive care. The Cronbach's alpha for the full scale is 0.95 and for the subscales is 0.87. Standardized summative scores range from 0 to 100, with higher scores indicating more PCMC. Correlations with related measures indicated high criterion validity.

Conclusions: The 35-item PCMC-U.S. scale and its subscales have high validity and reliability in a sample of predominantly Black women. This scale provides a tool to support efforts to reduce the inequities in birth outcomes experienced by Black, Indigenous, and other people of color.

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Maternal mortality in the United States is among the highest in high income countries—with significant racial inequities (Hoyert, 2021; Tikkanen, Gunja, FitzGerald, & Zephyrin, 2020). Black, Indigenous, and other people of color have the worst birth outcomes. Compared with White women, Black women have a three times higher risk of maternal mortality and a two times higher risk of preterm birth (March of Dimes, 2014; Neggers, 2016). Inequities in maternal mortality exist regardless of socioeconomic status and other individual factors (Centers for

Disease Control and Prevention, 2019), suggesting broader structural factors are at play. In particular, racism and discrimination across the life course are key factors underlying these disparities (Alhusen, Bower, Epstein, & Sharps, 2016; Crear-Perry et al., 2021; Dominguez, 2011; Slaughter-Acey et al., 2019).

Disrespectful care and mistreatment by health care providers have been shown to disproportionately affect people of color in the United States, particularly Black pregnant and birthing people, and have been attributed to racism and discrimination (Alhusen et al., 2016; Altman et al., 2019; Davis, 2018; McLemore et al., 2018; Vedam, Stoll, Taiwo, et al., 2019). Hospitalizations for childbirth are often considered the apex for these experiences, not only because birth is a major life transition, but also owing to exposure to unfamiliar providers and a culture of care that may or may not be aligned with patient expectations (Lyndon, Malana, Hedli, Sherman, & Lee, 2018). Mistreatment during this period thus contributes to disparities in adverse pregnancy and birth outcomes (Alhusen et al., 2016; Crear-Perry et al., 2021; Dominguez, 2011; Slaughter-Acey et al., 2019).

Person-centered care, or care that emphasizes the wants and needs of the patient over the provider, focuses on respect, trust, dignity, support, autonomy, and communication, represents a major component of high-quality care provision (Institute of Medicine Committee on Quality of Health Care in America, 2001; World Health Organization, 2016). Various aspects of person-centered care during childbirth are affected by implicit bias and are often dependent on providers' assumptions regarding the ability of birthing people to make decisions about their care (Afulani, Ogolla, et al., 2021; Altman et al., 2019; Vedam, Stoll, McRae, et al., 2019).

Numerous qualitative studies have documented the mistreatment of Black pregnant and birthing people during childbirth, including poor communication, coercion, disrespectful and abusive care, neglect, loss of autonomy and self-determination, and powerlessness to make decisions regarding their own care (Altman et al., 2019; Davis, 2018; Ebert, Bellchambers, Ferguson, & Browne, 2014; McLemore et al., 2018). Fewer studies have quantitatively measured person-centered care during childbirth; the few studies that exist report Black women are more likely to be mistreated and to experience discrimination during childbirth (Attanasio & Kozhimannil, 2015; 2017; Vedam, Stoll, Taiwo, et al., 2019). Further, few validated scales exist for the comprehensive measurement of person-centered care during childbirth, and none at the time we started this study were focused on the unique experiences of Black pregnant and birthing people in the United States (Nilvér, Begley, & Berg, 2017). The few existing validated scales measure specific aspects of person-centered care, such as autonomy and decision-making (Vedam, Stoll, Martin, et al., 2017) and respect (Vedam, Stoll, Rubashkin, et al., 2017). To our knowledge the only other tool that centers the unique experiences of Black women is the Patient Reported Experience Measure of Obstetric Racism Scale (The PREM-OB Scale), which is a trademarked tool focused on obstetric racism and intended for hospital based quality improvement (Scott, 2019; Scott & Davis, 2021). A comprehensive non-proprietary measurement tool for person-centered care during childbirth that is tailored for the experience of Black birthing persons and other of people of color, and which has broader application, is therefore needed.

We sought to adapt and validate a scale to measure person-centered care during labor and childbirth to reflect the experiences of birthing people in the United States, emphasizing the experiences of Black birthing people. While mistreatment is

prevalent among other people of color, we center the experiences of Black birthing people owing to their unique experiences of racism, which often result in mistreatment and discrimination in health care settings. We, however, included non-Black participants in all stages of the adaptation and validation process to increase the scale's relevance to other people of color and birthing people in the United States.

Methods

The Person-Centered Maternity Care (PCMC) scale, which was initially developed for use in low-resource countries (Afulani, Diamond-Smith, Golub, & Sudhinaraset, 2017), served as the basis for this U.S.-focused version. The original PCMC scale was first validated in Kenya and subsequently in India and Ghana (Afulani, Diamond-Smith, Phillips, Singhal, & Sudhinaraset, 2018; Afulani, Phillips, Aborigo, & Moyer, 2019; Afulani, Aborigo, et al., 2019). To adapt it for use in the United States, we followed standard scale development procedures and a community-engaged approach to ensure that it is valid and reliable and fits the needs of Black birthing people and families (DeVellis, 2016; Hinkin, Tracey, & Enz, 1997). Specifically, a literature review was conducted to define the construct and identify domains and to develop the initial list of items (Afulani et al., 2017). We then adapted the scale using expert reviews, cognitive interviews, structured surveys, and psychometric analysis—engaging community members throughout the process—and named the adapted version the PCMC-U.S. scale. We used a parallel process to develop a prenatal care-oriented measure, which we refer to as the Person-Centered Prenatal Care scale (Afulani, Altman, et al., 2021).

Expert Reviews

The goal of the expert review was to optimize content validity in terms of relevance and comprehensiveness (DeVellis, 2016). Our research team, which included clinicians and researchers, first reviewed the 30 items in the original PCMC scale and removed items not applicable to the United States setting (e.g., availability of water and electricity). We then held an expert review session with 10 members of the University of California, San Francisco (UCSF) California Preterm Birth Initiative's Community Advisory Board (CAB), which includes people of color (majority Black women) who have had preterm births, community-based health workers, and social service providers. The CAB members represent community experts who understand what PCMC means to people of color because of their direct service and lived experiences in the communities of focus. A second expert review session consisted of 20 people, including 2 community health workers, 4 CAB members, and 14 faculty members from institutions in the San Francisco Bay Area, representing research and clinical expertise in nursing, midwifery, obstetrics, and neonatology. During the two sessions, the remaining questions were reviewed, and several new questions were recommended that related to existing PCMC domains (e.g., "Did you feel heard and listened to?" "Did providers encourage you to ask questions?" "Did providers knock on your room's door and wait for response before entering?"). Questions on infant feeding choices and emotional well-being were also added. In total, 16 new questions were added through the expert review process. CAB members were paid \$40/hour for their participation in these sessions.

Table 1
Person-Centered Maternity Care (PCMC) Questions

No. Question in Original PCMC Scale §	Final Question in PCMC-U.S. Scale*	Label
1. How did you feel about the amount of time you waited? Would you say it was very short, somewhat short, somewhat long, or very long?	How did you feel about the amount of time you had to wait before being examined by a health care provider (doctor or midwife)?	Wait time
2. †	How did you feel about the amount of time you had to wait in triage before being seen and assessed?	Triage time
3. During your time in the health facility did the doctors, nurses, or other health care providers introduce themselves to you when they first came to see you?	Did each new provider introduce themselves to you when they first came to see you?	Introduction
4. Did the doctors, nurses, or other health care providers call you by your name?	Did your providers call you by your preferred name?	Preferred name
5. Did the doctors, nurses, or other staff at the facility treat you with respect?	Did your providers treat you with respect?	Treated with respect
6.	Did you feel your experience and knowledge were valued?	Experience valued
7.	Did you feel your customs and culture were respected by your providers?	Customs respected
8.	Did you feel heard and listened to by your providers?	Felt heard
9.	Did providers knock on your room's door and wait for response before entering?	Privacy-knock on door
10. During examinations in the labor room, were you covered up with a cloth or blanket or screened with a curtain so that you did not feel exposed?	During examinations, were you covered up with a cloth or blanket or screened with a curtain so that you did not feel exposed?	Privacy-covered
11. Do you feel like your health information was or will be kept confidential at this facility?	Did you feel your health information was kept confidential and private by providers and staff?	Information confidential
12. Did you feel like the doctors, nurses, or other staff at the facility involved you in decisions about your care?	Did your providers involve you in decisions about your care?	Involved in decisions
13.	Did you feel coerced or pressured into a decision by providers?	Coercion
14. Did the doctors and nurses explain to you why they were doing examinations or procedures on you?	Did your providers explain to you why they were doing examinations or procedures on you?	Explain procedures
15.	Did your providers explain to you why they were doing examinations or procedures on your baby?	Explain baby procedures
16. Did the doctors and nurses explain to you why they were giving you any medicine?	Did your providers explain to you why they were giving you any medicine?	Explain medication
17. Did the doctors, nurses, or other staff at the facility ask your permission/consent before doing procedures and examinations on you?	Did providers or other staff ask your permission/consent before touching or doing procedures or examinations on you?	Consent
18.	Did you feel your birth plan or preferences were respected? (e.g., moving during labor, pain management, music, birthing position)	Birth preferences respected
19. During the delivery, do you feel like you were able to be in the position of your choice?	Were you able to give birth in the position of your choice?	Birth position of choice
20. Were you allowed to eat or drink when you were hungry/thirsty?	Were you able to eat and drink if desired?	Eat
21. Did the doctors, nurses, or other staff at the facility speak to you in a language you could understand?	Did your providers speak to you using language or words you could understand?	Language understood
22.	Did you feel informed about what was happening to you during your childbirth?	Felt informed
23. Did the doctors and nurses at the facility talk to you about how you were feeling?	Did your providers ask about your emotional well-being?	Emotional well-being
24.	Did your providers provide you with resources to help with your emotional well-being if you needed it?	Resources for emotional well-being
25. Did you feel you could ask the doctors, nurses or other staff at the facility any questions you had?	Did you feel you could ask your providers any questions you had?	Could ask questions
26.	Did you hold back on asking questions for any reason?	Hold back on asking questions
27.	Did providers encourage you to ask questions?	Encourage you to ask questions
28.	Did providers check that you understood information that was given to you?	Checked understanding
29.	Do you feel your questions were answered when you did ask?	Questions were answered
30. Did the doctors, nurses, and other staff at the facility show they cared for you?	Did providers give you information in a way that showed they cared about you?	Information showed they cared
31.	Did providers respect your family or companions who were with you?	Family respected
32. Were you allowed to have someone you wanted to stay with you during delivery?	Were you allowed to have everyone you wanted (e.g., doula, elder, friends, or family) stay with you during your childbirth?	Companionship
33. When you needed help, did you feel the doctors, nurses, or other staff at the facility paid attention?	Did you feel your providers responded in a timely manner when you requested assistance?	Timely response
34. Did the doctors and nurses ask how much pain you were in?	Did you feel your providers believed you when you said you were in pain?	Believed about pain
35. Do you feel the doctors or nurses did everything they could to help control your pain?	Do you feel your providers did everything they could to help you manage your pain?	Pain management
36.	Did you feel your providers avoided, ignored, or otherwise neglected you?	Neglected

Table 1 (continued)

No. Question in Original PCMC Scale [§]	Final Question in PCMC-U.S. Scale*	Label
37. Did you feel the doctors, nurses, or other health providers shouted at you, scolded, insulted, threatened, or talked to you rudely?	Did you feel your providers shouted at you, scolded, insulted, threatened, or talked to you rudely?	Verbal abuse
38. Did you feel like you were treated roughly... like pushed, beaten, slapped, pinched, physically restrained, or gagged?	Did you feel like your providers handled you roughly, held you down, or physically restrained you?	Physical abuse
39. Did you feel the doctors, nurses, or other staff at the facility took the best care of you?	Did you feel your providers took the best care of you?	Took best care
40. Did you feel you could completely trust the doctors, nurses, or other staff at the facility with regards to your care?	Did you feel you could completely trust your providers with regards to your care?	Trust
41. During your time in the health facility, would you say you were treated differently because of any personal attribute... like your race, ethnicity, culture, sex, gender, sexual orientation, language, immigration status, religion, income, education, age, marital status, number of children, insurance status, or other attribute?	Would you say you were discriminated against because of your race, ethnicity, culture, sex, gender, sexual orientation, language, immigration status, religion, income, education, age, marital status, number of children, insurance status, or other attribute?	Discrimination
42.	Were you separated from your baby at any time after the birth?	Separated from baby
43.	Was your feeding choice for your baby (e.g., breastfeeding, bottle feeding, both) respected by providers?	Baby feeding choice respected
44.	Did you receive the support you needed to reach your baby's feeding goals? (e.g., lactation support)	Support for baby feeding
45.	Were you supported in creating a birth environment that made you feel comfortable?	Comfortable birth environment
46.	Do you think the place you gave birth met your needs?	Needs met
47. Thinking about the wards, washrooms, and the general environment of the health facility, will you say the facility was very clean, clean, dirty, or very dirty?	Thinking about the place where you gave birth, did you feel that the rooms and facilities were clean?	Clean rooms
48. Thinking about the labor and postnatal wards, did you feel the health facility was crowded?	Did you feel the place you gave birth was crowded during your birth stay? (e.g., not enough beds, moved from room to room, being in triage a long time)	Crowded
49. In general, did you feel safe in the health facility?	In general, did you feel physically safe in or around your place of birth?	Felt safe
50.	Did you feel you had access to your preferred place of birth?	Preferred clinic

[§] Questions in original PCMC scale excluded from PCMC-U.S. scale include: Was there water in the facility? Was there electricity in the facility? Did the doctors, nurses, and other staff at the facility treat you in a friendly manner? Did the doctors, nurses, or other staff at the facility support your anxieties and fears? Do you think there was enough health staff in the facility to care for you? "Were you allowed to have someone you wanted to stay with you during labor?" and "[w]ere you allowed to have someone you wanted to stay with you during the delivery?" were combined into one question.

* All questions have responses options 0. No, never; 1. Yes, a few times; 2. Yes, most of the time; 3. Yes, all the time. Except the following: Wait time and triage time options: 0. It was just right; 1. It was somewhat long; 2. It was very long; 3. It was extremely long. Introduction options: 0. No, none of them; 1. Yes, a few of them; 2. Yes, most of them; 3. Yes, all of them. Neglect, verbal, and physical abuse options: 0. No, never; 1. Yes, once; 2. Yes, a few times; 3. Yes, many times.

† Blank indicates not part of original scale and added as part of adaptation process.

‡ Fell out after factor analysis of original scale.

Cognitive Interviews

We next conducted cognitive interviews to assess and improve comprehensibility, relevance, and comprehensiveness of the questions (Collins, 2003; Nápoles-Springer, Santoyo-Olsson, O'Brien, & Stewart, 2006), using an interview guide that addressed item wording, possible sources of confusion, and appropriateness of items, as well as whether questions were missing. We conducted cognitive interviews with 15 participants who were more than 28 weeks pregnant or had given birth within the past year. Cognitive interview participants identified as Black (n = 11), Latina (n = 2), Asian (n = 1), or White (n = 2) (includes multiracial). Participants were recruited from partner organizations and from a UCSF database of patients who had previously participated in studies and were interested in being contacted for future studies. Participants received a \$50 gift card for participation. Feedback from the cognitive interviews was used to revise the items, primarily by rephrasing questions or adding examples for clarity, and to add four questions. At the end of this process, we had 50 candidate items for the PCMC-U.S. scale (Table 1), which were then integrated into the study questionnaire that included items on sociodemographic characteristics, a prenatal version of this scale (Afulani, Altman, et al., 2021), and additional questions and scales to support the validation process. The questionnaire was piloted with eight people meeting the eligibility criteria for the planned survey to ensure acceptability and ease of completion.

Survey

Participants for the survey were recruited through community-based organizations and targeted social media advertisements. Individuals aged 15 years or older who had given birth in the past year were eligible to participate, and recruitment materials indicated that the study was focused on the experiences of people of color. We conducted the survey between January and September 2020 using the Research Electronic Database Capture online survey platform (Harris et al., 2009). Individuals who were interested in joining the study emailed the study team, answered eligibility questions, and once confirmed as eligible, were emailed a personalized link to complete the survey. Study information was provided on the landing page and respondents clicked a button to indicate informed consent before the survey. Participants received a \$40 electronic gift card upon completing the survey. Ethical approval was obtained from UCSF's Institutional Review Board.

Psychometric Analyses

The goal of the psychometric analyses was to assess and improve the scale's construct and criterion validity and internal reliability (DeVellis, 2016; Hinkin et al., 1997). We first examined the distributions of the items and recoded some response options to obtain a uniform scale, which for most questions was

0 (no, never), 1 (yes, a few times), 2 (yes, most of the time), and 3 (yes, all the time). To ensure that all response options ranged from 0 to 3, we recoded items that had a not applicable category (4) to the upper middle category (2 [yes, most of the time]), because there is no middle category because of the even number of response options. This approach to avoid dropping respondents for whom a few of the questions were not applicable is conservative. We also reverse-coded negative items so that all responses reflected a scale ranging from 0 as the lowest level of person-centered care to 3 as the highest level of person-centered care. We then constructed a correlation matrix to examine the correlations among the items.

Construct validity was assessed via exploratory factor analysis (DeVellis, 2016; Hinkin et al., 1997). We used the Kaiser–Meyer–Olkin measure to test the suitability of the items for factor analysis. The decision on how many factors to retain was made using Kaiser's rule of retaining only factors with eigenvalues of 1 or higher and examining the “elbow” of the scree plot (plot of eigenvalues) (Afifi, Clark, & May, 2004; DeVellis, 2016; Hinkin et al., 1997). Oblique rotation, which allows for correlation between the rotated factors, was used because the person-centered care domains are theoretically related (Afifi et al., 2004; Hinkin et al., 1997). We used initial criteria of factor loadings of 0.3 or greater and uniqueness of 0.8 or less in iterative factor analysis, combined with feedback from the CAB to determine which items to retain or exclude (Afifi et al., 2004). Subscales were generated using the loading of the items on the extracted factors and conceptual groupings, and the items were summed to generate the PCMC-U.S. scale and subscale scores.

Internal consistency reliability was assessed using Cronbach's alpha (DeVellis, 2016; Hinkin et al., 1997). To assess criterion validity, we examined whether scales and subscales were associated with theoretically related constructs (DeVellis, 2016), such as satisfaction with intrapartum care, perceived quality of intrapartum care, and intention to use the same service in the future (Afulani et al., 2017; Sheferaw, Mengesha, & Wase, 2016). These were single item measures included in the survey. Additionally, we examined the association between scores on the PCMC-U.S. scale and scores on two other composite measures that assess autonomy and respectful care during pregnancy and childbirth: the Mothers Autonomy in Decision Making scale (MADM) and the Mothers on Respect Index (MORI) (Vedam, Stoll, Martin, et al., 2017; Vedam, Stoll, Rubashkin, et al., 2017). We tested our hypotheses through correlations and bivariate linear and logistic regression analysis, using STATA version 15 (StataCorp, College Station, TX).

Results

In total, 312 participants completed the study. Fifteen participants who did not respond to all the PCMC-U.S. items were excluded, resulting in an analytic sample of 297. Most respondents identified as Black (82%). Their average age was 29 years ($SD = 3.6$), and most were married (89%), primiparous (76%), and college graduates (52%) (Table 2).

The distributions of the 50 individual PCMC-U.S. items are in Appendix A. With few exceptions, the responses ranged between 0 and 3. The proportion of N/A responses on items that generated N/A responses ranged from 1% to 13%, except for the questions regarding whether providers explained medications and respected their customs, for which 54% responded that they did not receive any medicine and 24% responded they had no particular customs. There was good correlation between most

Table 2
Characteristics of Respondents ($N = 297$)

	No.	%
Race/ethnicity		
Black/African American	242	81.5
White	33	11.1
Asian	5	1.7
Hawaiian/Pacific Islander	3	1.0
Latina/Hispanic	18	6.1
American Indian/Alaska Native	3	1.0
Multiracial	2	0.7
Other	5	1.7
Prefer not to answer	3	1.0
Partner's race/ethnicity		
Black/African American	240	80.8
White	35	11.8
Asian	4	1.3
Hawaiian/Pacific Islander	1	0.3
Latinx/Hispanic	18	6.1
American Indian/Alaska Native	2	0.7
Multiracial	1	0.3
Other	3	1.0
Prefer not to answer	2	0.7
No partner	2	0.7
Age, years		
17–28	102	34.3
29–32	125	42.1
33–45	70	23.6
Married	263	88.6
Primiparous	225	75.8
Time since delivery, months		
<3	103	34.7
3–4	106	35.7
5–12	88	29.6
Educational attainment		
High school or less	38	12.8
Some college	106	35.7
College graduate	153	51.5
Average yearly income		
<\$50,000	62	20.9
\$50,0001–\$100,000	185	62.3
>\$100,000	50	16.8
Employment status		
Not employed	104	35.0
Employed full time	152	51.2
Employed part time	37	12.5
Prefer not to answer	4	1.3
Insurance type		
No insurance	7	2.4
Private/employer-provided insurance	243	81.8
Medicaid/MediCal	16	5.4
Medicare	22	7.4
Tricare/government	2	0.7
Prefer not to answer	7	2.4

items, which generally ranged from 0.2 to 0.7. Items that had correlations of less than 2 or negative correlations with other items were flagged. These included the questions on preferred name, preferred language, position of choice, being separated from the baby, support for feeding goals, cleanliness, coercion, holding back from asking questions, and crowding.

The Kaiser–Meyer–Olkin measures of sampling adequacy for all items ranged from 0.69 to 0.97, with an overall Kaiser–Meyer–Olkin of 0.94, indicating suitability for factor analysis. The initial factor analysis with all 50 items yielded 6 factors with eigenvalues of 1 or higher, accounting for 84% of the cumulative variance. However, there was one dominant factor (Figure 1) with an eigenvalue of 16.8, which accounted for 60% of cumulative variance. The eigenvalues for the other factors were less than 2 (range, 1.0–1.6). All items had a factor loading of 0.3 or

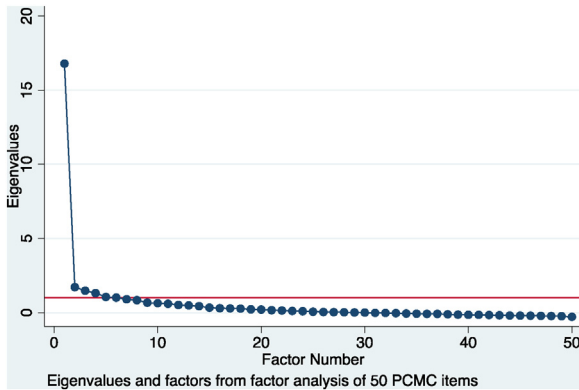


Figure 1. Scree plot from factor analysis of 50 PCMC items.

greater on at least one of the six factors, except the questions on introduction, language, informed about what was happening, and support for feeding goals, which had loadings of between 0.2 and 0.3. Uniqueness for all items was less than 0.8, except for introduction, separation, language, holding back from asking questions, and crowding, which had uniqueness between 0.8 and 0.9. When the analysis was restricted to the single factor structure, all items had loadings of greater than 0.3 except the items on name, separation, explained medications, coercion, holding back from asking questions, and crowding, which had loadings of

less than 0.2 and a uniqueness of more than 0.9. We conducted an iterative factor analysis dropping different items and examining the results. Given the need for a parsimonious scale, we also identified items that were conceptually similar for possible elimination.

We presented the initial findings to the CAB and suggested dropping the items that had low loadings, high uniqueness, or conceptual difference/similarity. Although some CAB members acknowledged 50 items were too many for a scale, many strongly felt that all questions were important and should be included; consensus on items to drop was therefore not achieved. Thus, to enable us to get to a smaller subset of questions, we used the results of the factor analysis, as well as conceptual domains based on the World Health Organization experience of care domains (Tunçalp et al., 2015), to group the 50 items into three domains for dignity and respect (DR) (11 items), communication and autonomy (CA) (19 items), and responsive and supportive care (RS) (20 items). We then created a survey, grouping conceptually similar items together, and asked CAB members and research team members to select their top 8 to 10 questions from each domain.

The results of this survey (completed by 14 people and shown in Appendix B) were combined with the factor analysis to select items for the scale. We first decided to drop all items selected by less than one-third of respondents (<5), because this suggested low priority, resulting in the elimination of 13 items (4 from CA, 1 from DR, and 8 from RS). We then reran the factor analysis on the

Table 3
Results of Exploratory Factor Analysis for 35-Item Person-Centered Maternity Care-U.S. Scale (N = 297)

	Single Factor		Three-Factor Structure				Loading on Individual Subscales			
	F1	Uniqueness	F1	F2	F3	Uniqueness	CA	DR	RS	Uniqueness
1. Introduction	0.36	0.87		0.23		0.86	0.36			0.87
2. Felt heard	0.72	0.49	0.33	0.47		0.47	0.75			0.44
3. Involved in decisions	0.77	0.41	0.45	0.42		0.39	0.79			0.37
4. Explain procedures	0.68	0.54		0.59		0.47	0.72			0.49
5. Consent	0.59	0.66		0.69		0.55	0.62			0.62
6. Language understood	0.40	0.84	0.28			0.82	0.48			0.77
7. Felt informed	0.55	0.70		0.44		0.68	0.60			0.64
8. Could ask questions	0.63	0.61		0.42		0.57	0.64			0.59
9. Checked understanding	0.71	0.49	0.57			0.44	0.72			0.48
10. Birth position of choice	0.53	0.72	0.44			0.67	0.48			0.77
11. Explain baby procedures	0.63	0.60	0.30	0.41		0.58	0.70			0.51
12. Birth preferences respected	0.52	0.73	0.36			0.72	0.54			0.71
13. Baby feeding choice respected	0.58	0.66		0.32		0.66	0.56			0.69
14. Coercion	0.13	0.98			0.47	0.78	0.10			0.99
15. Treated with respect	0.76	0.42		0.63		0.38		0.75		0.44
16. Family respected	0.79	0.38	0.70			0.33		0.80		0.36
17. Information confidential	0.50	0.75		0.81		0.54		0.43		0.81
18. Privacy-covered	0.46	0.79		0.41		0.71		0.44		0.80
19. Verbal abuse	0.52	0.73	0.55		0.32	0.60		0.54		0.71
20. Physical abuse	0.54	0.71	0.56			0.66		0.56		0.69
21. Discrimination	0.74	0.45	0.74			0.37		0.81		0.34
22. Neglected	0.61	0.63	0.59		0.35	0.49		0.62		0.61
23. Experience valued	0.78	0.39	0.40	0.47		0.37		0.73		0.47
24. Customs respected	0.60	0.64	0.71			0.53		0.63		0.60
25. Emotional well-being	0.56	0.69	0.52			0.61			0.52	0.73
26. Pain management	0.45	0.80		0.32		0.77			0.47	0.78
27. Took best care	0.73	0.46		0.58	0.37	0.35			0.79	0.38
28. Trust	0.73	0.46		0.75		0.33			0.78	0.40
29. Felt safe	0.58	0.66		0.54	0.34	0.55			0.59	0.65
30. Companionship	0.51	0.74	0.68			0.63			0.52	0.73
31. Timely response	0.62	0.62	0.54			0.58			0.65	0.58
32. Believed about pain	0.63	0.60	0.49			0.58			0.66	0.56
33. Support for baby feeding	0.52	0.73		0.46		0.70			0.49	0.76
34. Comfortable birth environment	0.75	0.43	0.72			0.38			0.73	0.47
35. Wait time	0.50	0.75	0.35			0.73			0.50	0.75

Abbreviations: CA, communication and autonomy; DR, dignity and respect; F, factor; RS, responsive and supportive.

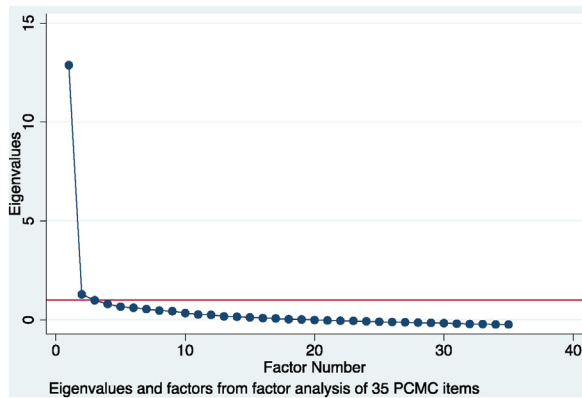


Figure 2. Scree plot from factor analysis of 35 PCMC items.

remaining 37 items. All but three items had loadings of more than 0.3 on the single factor for each domain and on the full scale (coercion, called by preferred name, and being separated from baby). Because the items on preferred name and being separated from baby were not highly ranked in the survey (selected by only five people), we decided to drop these two items next, but retained the coercion item despite its low loading because it was recommended by most respondents ($n = 9$) and was one of the items CAB members felt strongly about retaining. Of note, despite reporting a generally good experience, approximately 30% of participants in this sample reported being pressured into a decision by their providers, pointing to the importance of this item. This yielded a 35-item scale with 3 factors (Figure 2). All items had loadings of more than 0.3 on the full scale and on the single factor for each domain, except the item on coercion (Table 3). Dropping the coercion item yielded a 34-item version in which all had loadings of greater than 0.3 on the full scale and on the single factor for each domain. Inclusion of the coercion item, however, did not significantly change the loadings of the other items or the Cronbach's alpha (which was 0.95 in both cases). So the 35-item version was maintained with 14, 10, and 11 items, respectively, for the CA, DR, and RS subscales. The Cronbach's alpha for all the subscales is 0.87 (Table 4).

To create summative scores for the full scale and subscales, the item responses are summed and then standardized by dividing the mean score by the maximum possible scores (e.g., 105 [35×3] for full scale, 42 [14×3] for CA, 30 [10×3] for DR, and 33 [11×3] for RS) and multiplying by 100. The standardized scores thus range from 0 to 100 for all the scores, where 0 is the worst PCMC and 100 is the best PCMC one can receive. This (see Table 4) yielded an average standardized PCMC score of 89 for the sample. The highest subscale score is for DR (92) and the lowest score is for CA (87).

The associations between the full PCMC-U.S. scale and subscales and the related measures provided support for criterion validity. The regression of each of the subscales and the full scale on participants' ratings of satisfaction with services, general

quality ratings, and whether they would give birth in the same facility if they were to become pregnant again shows higher PCMC is associated with higher odds of satisfaction with care, perceived quality of care, and intent to give birth in the same facility in the future (Table 5). The correlation coefficients between the PCMC-U.S. scale and subscale scores and the MORi and MADM scale scores are all greater than 0.5, with a correlation coefficient of 0.69 for CA and MADM and 0.63 for DR and MORi.

Discussion

We used a rigorous, community-engaged approach to adapt the PCMC scale for use in the United States—prioritizing the experiences of Black women and birthing people. Through expert reviews and cognitive interviews, we developed 50 candidate items for the PCMC-U.S. scale. We then used psychometric analysis and feedback from the CAB to reduce the items to a 35-item PCMC-U.S. scale, which has 3 subscales measuring DR, CA, and RS. The full scale and the subscales have good content, construct, and criterion validity, with Cronbach's alphas of 0.95 for the main scale and greater than 0.8 for the subscales.

The final version of the PCMC-U.S. scale ended up being similar to the original version (Afulani et al., 2017, 2018), with some subtle differences. Both versions have similar subscales, given the similar set of items and conceptual groupings using the WHO experience of care domains (Tunçalp et al., 2015). Although the questions have similar wording, the adaption process ensured that the exact wording of items in the new version is appropriate for the United States context. The response options used in the original PCMC scale were maintained, because participants in the cognitive interviews found the frequency response format to be easy to respond to and did not think it should be changed. This response format leads to greater variability in responses than binary yes/no responses. Acquiescence bias is also less of a concern than it is with the agree/disagree format used in other scales (Holbrook, 2008).

The original PCMC scale has 30 items, compared with 35 items in the PCMC-U.S. scale. This is due to several questions that were added during the adaptation process, leading to a set of 50 potential items, all of which were felt to be highly relevant by the cognitive interview participants and the CAB. The 35 items included in the PCMC-U.S. scale are the result of our attempt to produce a parsimonious but comprehensive scale that incorporates feedback from the CAB and has high validity and reliability. Thus, although we excluded 15 items from the scale, these items should be included in surveys that are able to include a longer list of questions to further examine their relationships. In addition, we included the question on coercion despite its poor performance in factor analysis because of its importance to the experiences of Black women and birthing people (Davis, 2018; Grace & Anderson, 2018). The performance of this item should be reassessed in future studies, including a reevaluation of the wording.

The PCMC-U.S. scale is different from other scales for measuring birthing people's experiences. First, to our knowledge

Table 4
Scale and Subscale Properties and Distribution of Scores ($N = 297$)

	No. of Items	Cronbach's Alpha	Raw Scores				Standardized Score			
			M	SD	Min	Max	M	SD	Min	Max
Full PCMC-U.S. scale	35	0.95	93.6	12.9	22.0	105.0	89.2	12.3	21.0	100.0
Communication and autonomy	14	0.87	37.1	5.2	11.0	42.0	88.4	12.3	26.2	100.0
Dignity and respect	10	0.87	27.7	3.6	7.0	30.0	92.4	12.1	23.3	100.0
Responsive and supportive care	11	0.87	28.8	4.8	4.0	33.0	87.2	14.6	12.1	100.0

Table 5
Bivariate Logistic and Linear Regression of Scale Scores on Related Measures to Assess Criterion Validity (N = 297)

	Satisfied with Care		Will Birth in Same Place Again		Rated Quality of Care as Very Good		MADM Score		MORi Score	
	OR	95% CI	OR	95% CI	OR	95% CI	β	95% CI	β	95% CI
Full PCMC-U.S. scale	1.14*	1.09–1.18	1.09*	1.06–1.11	1.11*	1.07–1.14	0.35*	0.32–0.39	0.20*	0.17–0.22
Communication and autonomy	1.13*	1.09–1.17	1.08*	1.05–1.11	1.10*	1.07–1.13	0.34*	0.30–0.38	0.18*	0.15–0.21
Dignity and respect	1.10*	1.07–1.14	1.07*	1.04–1.09	1.10*	1.06–1.13	0.33*	0.28–0.37	0.20*	0.17–0.23
Responsive and supportive care	1.13*	1.09–1.17	1.08*	1.05–1.10	1.09*	1.06–1.12	0.28*	0.25–0.32	0.16*	0.13–0.18

Abbreviations: CI, confidence interval; OR, odds ratio; MADM, Mothers Autonomy in Decision Making scale; MORi, Mothers on Respect index; PCMC, Person-Centered Maternity Care. N = 296 for MADM model.

Note: Each row is a different bivariate model.

* $p < .001$.

it is the first available, validated person-centered care scale that centers the childbirth experiences of Black people. Continuous engagement with members of the priority community ensured that the items in the scale capture their unique experiences (Altman et al., 2019; 2020; McLemore et al., 2018). The scale items were intentionally developed to include a mix of subjective questions (e.g., feeling respected) to capture people's subjective perceptions, as well as more objective and actionable items (e.g., allowed a companion) that can inform quality improvement (Afulani, Aborigo, et al., 2019; Montagu et al., 2020). The PCMC-U.S. scale is also among the few tools that measure experiences of person-centered care during childbirth in a comprehensive manner (Nilvér et al., 2017).

Strengths and Limitations

A key strength of this study is the use of a community-based participatory approach embedded in standard instrument development methods. This practice helped to ensure that the PCMC-U.S. scale is relevant to people of color—particularly the Black community. Starting with a validated tool also provided a rigorous, theory-based foundation for the adaptation. A potential limitation is generalizability, given the relatively highly educated validation sample. This, however, is also a strength of the study, as it represents the views of a group of Black people usually overlooked.

The PCMC scores for this sample were quite high, which may be due to the demographics of the sample. This highlights a need for additional validation in a more diverse sample to assess its performance among communities experiencing a variety of intersectional identities and socioeconomic conditions. Another limitation is the low representation of non-Black persons of color, which is likely because of demographics of our recruitment sites, our recruitment strategies, and the survey having been administered in only English. Plans for validation in a Spanish-speaking population are in place, and future validation efforts in other languages should be undertaken. The similarities between the original PCMC scale and the U.S. version suggest that the scale may be applicable across different populations.

The items highly ranked in the prioritization process to reduce the length of the scale may have been influenced by the lived experiences of the CAB and study team members who participated. This was necessary to reduce respondent burden, which may still be a concern to some even with the 35-item version. However, given the multidimensional nature of person-centered maternity care, the assessment of the relevance of the items included, and their psychometric performance, this is the most parsimonious version of the scale we are able to recommend at this time. The

subscales can be used individually where necessary, but we recommend measuring all three domains to assess PCMC in a holistic manner. It takes about 10 minutes to answer all the questions. Shorter versions will be developed in future studies when data from more diverse samples are available, as was done for the international version (Afulani, Feeser, et al., 2019).

Implications for Practice and/or Policy

Given the growing literature on the poor experiences of people of color in health care settings, it is important that these experiences are documented in a systematic manner. In addition, there is the need to develop and evaluate interventions to improve the experiences of people of color in health care settings including during childbirth. These efforts require measures that center the experiences of the affected communities (Scott, 2019). The PCMC-U.S. scale, together with ongoing efforts to measure obstetric racism (Scott & Davis, 2021), provide tools for these purposes.

Conclusions

Using a community-engaged process, we adapted the PCMC scale that was initially developed in Kenya and India to make it relevant to the United States. The PCMC-U.S. scale has high validity and reliability in a sample of predominantly Black persons. The scale will help drive efforts as well as serve as an accountability tool by quality improvement teams, person-centered care advocates, health insurance agencies, health care system leaders, patients, and researchers, in efforts to reduce inequities in pregnancy and birth outcomes.

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Supplementary Data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.whi.2022.01.006>.

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