Original Research Article

Reduction of the Quality of Contraceptive Counseling (QCC) scale to a short version (QCC-10) in Ethiopia, India, and Mexico

Kelsey Holt\textsuperscript{a,}\textsuperscript{a}, Celia Karp\textsuperscript{b}, Bella V. Uttekar\textsuperscript{c}, Ximena Quintero\textsuperscript{d}, Ewenat Gebrehanna\textsuperscript{e}, Lakshwani Kanchan\textsuperscript{f}, Icela Zavala\textsuperscript{f}

\textsuperscript{a} Department of Family & Community Medicine, University of California, San Francisco, CA, United States
\textsuperscript{b} Department of Population Family and Reproductive Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, United States
\textsuperscript{c} Centre for Operations Research and Training, Vadodara, India
\textsuperscript{d} Department of Latinamerican Studies, National Autonomous University of Mexico, Mexico City, Mexico
\textsuperscript{e} School of Public Health, St. Paul’s Hospital Millennium Medical College, Addis Ababa, Ethiopia
\textsuperscript{f} Department of Collective Health Sciences, Metropolitan Autonomous University-Xochimilco, Mexico City, Mexico

Abstract

Objective: To reduce the Quality of Contraceptive Counseling (QCC) scale to a shortened version, coined the QCC-10, for use in measuring client-reported quality of counseling across varied settings.

Study design: Secondary psychometric analysis of data collected for validating full versions of the QCC scale (QCC-Mexico, QCC-Ethiopia, QCC-India) and expert voting to reduce the original 26 QCC items to a 10-item set.

Results: Exploratory factor analysis revealed a clear one-factor solution for the QCC-10 in each country. Factor loadings were consistently >0.4 for all but two items; both were retained due to their importance to content validity. Internal consistency reliability of the QCC-10 was α=0.8 in Mexico and Ethiopia, and α=0.5 in India. QCC-10 scores were highly and positively correlated with a dichotomous overall measure of client experience and intention to initiate selected method, indicating convergent validity.

Conclusion: The QCC-10 offers an innovative, cross-cultural approach to measuring quality in contraceptive counseling. Future efforts should examine its validity and reliability for use globally, with additional exploration of how to best measure negative aspects of care, particularly in India where such items were problematic. Thoughtful, nuanced measurement of client perspectives on their counseling experiences, available via the QCC-10, is critical to monitoring and improving quality of person-centered care and the fulfillment of human rights in contraceptive services worldwide.

Implications: Cross-cultural, person-centered measures of quality in contraceptive counseling, such as the QCC-10, can help inform efforts to improve quality of family planning services and fulfillment of human rights. Future work will continue to explore the validity of this 10-item measure for use in various settings.

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1. Introduction

The provision of high-quality contraceptive services is necessary to protecting individuals' reproductive autonomy, health, and human rights [1,2]. Despite rising clinical and public health focus on quality and patient-centeredness [3–5], measurement of client experience has proved challenging given the range of both clinical and interpersonal elements required for high-quality counseling and the context-specific nature of what individuals value in clinical encounters [6,7]. Further, integration of human rights principles into conceptualizations of quality and related measures is relatively recent [8].

The Quality of Contraceptive Counseling (QCC) scale addresses these gaps by examining the extent to which contraception clients perceive services as delivered according to their informational and interpersonal needs and in accordance with their human rights. QCC scale domains include client report of decisional support around method options (information exchange); interpersonal relationship with the provider, including protection of privacy and time for decision-making (interpersonal relations); and fulfillment of
human rights, including respect for client autonomy (disrespect and abuse). The QCC scale was originally developed in Mexico [9] and then adapted and validated for use in Ethiopia and India [10]. Extensive formative research was conducted in these countries to ensure items were grounded in women’s preferences for counseling [11–13].

The three validated QCC scale versions (QCC-Mexico, QCC-Ethiopia, QCC-India) have 22 to 26 items, depending on the context [9,10]. These original versions of the scale are useful tools for research that aims to explore nuances in quality of contraceptive counseling. At the same time, a shorter version of the scale is needed for wider use, especially for integration with data collection mechanisms that are unlikely to accommodate the full scale. A shortened version of the QCC scale may prove particularly beneficial for use within routine data systems in health facilities as part of continuous quality improvement processes and for efforts to compare counseling experiences across different geographies.

This paper describes the process used to reduce the QCC scale to a shortened version, coined the QCC-10, for application in contraception programs that seek to assess and monitor client-reported quality of counseling.

2. Material and methods

2.1. Data source

We conducted psychometric analysis of client survey data collected previously for purposes of validating the original QCC scales (QCC-Mexico, QCC-Ethiopia, QCC-India) and triangulated findings across countries to reduce the QCC scale to 10 items. The study in Mexico (N = 499) was conducted in public clinics and hospitals in two states (San Luis Potosí and Mexico City), including 129 different providers, and was approved by the Harvard T.H. Chan School of Public Health Institutional Review Board (IRB) [9]. The study in Ethiopia (N = 599) was conducted in Addis Ababa in public health centers and franchise clinics of a large non-governmental organization providing reproductive health services (number of providers included was not documented) and was approved by the University of California, San Francisco (UCSF) and St. Paul’s Hospital Millennium Medical College IRBs [10]. The study in India (N = 313) was conducted in government public health centers in Gujarat state (number of providers included was not documented) and was approved by the Centre for Operations Research and Training (CORT) IRB and deemed exempt by the UCSF IRB due to the lack of identifying information provided to UCSF researchers from the CORT team [10]. All surveys were administered to clients by study staff.

Eligibility criteria included being female and having spoken with a provider about starting, changing, or discontinuing contraception either on the day of recruitment (Ethiopia and Mexico) or within the past 2 weeks (India). Recognizing that client report of counseling quality is likely clustered by provider, we recruited from a convenience sample within multiple health care settings in each country to encourage variability in client experiences. Demographics of study participants are available in the original validation study manuscripts [9,10]. In summary, participants across all settings were on average in their late 20s and dedicating themselves primarily to household work or childcare. In Mexico and Ethiopia only, the majority had finished secondary school.

2.2. QCC scale overview

The QCC scale was developed in Spanish in Mexico [9] and later adapted for Ethiopia (Amharic language) and India (Gujarati language) [10], drawing on qualitative research on women’s experiences with and preferences for contraceptive counseling conducted in each setting [11–13]. The country-specific number of QCC scale items ranged from 22 to 26 (Table 1). Most items were consistent across settings (n = 18); four were unique to India and Ethiopia, four unique to Mexico and Ethiopia, and one unique to India. Items mapped to one of three QCC constructs, including (1) information exchange, or assessment of client needs and provision of information essential for decision-making; (2) interpersonal relations, or relationship-building aspects of counseling (e.g., privacy, confidentiality, trust); or (3) disrespect and abuse, defined as coercion, pressure, or mistreatment by providers. This dimensionality held across all three settings.

The scale was administered with a four-point response scale with response categories for positively worded items ranging from completely agree to completely disagree, and for negatively worded items “yes,” “yes with doubts,” “no with doubts,” and “no.” Composite scores and subscale scores were calculated using a mean of all item responses. The study team chose mean scoring given the clinical utility of the QCC scale and the need to prioritize ease of calculation of scores in quality improvement contexts.

2.3. Item reduction process

Our item reduction process consisted of triangulating quantitative psychometric findings with qualitative consideration of item interpretability (as assessed by expert opinions of study team members representing the three countries) and coverage of the full QCC measurement construct [6]. Our first step was to tally votes among the five co-investigators from the three QCC teams in Mexico, Ethiopia, and India (QX, IZ, BU, KL, EG) who were asked to vote for 10 priority items from the perspective of item interpretability and content validity, drawing on their knowledge of cultural contexts, participant understanding during piloting and data collection, and alignment with the measurement framework. We then added items in order of number of votes received into a spreadsheet, along with information on factor loadings from prior studies and labels for domain of the QCC construct (information exchange, interpersonal relationship, or disrespect and abuse) covered.

We decided a priori to select a total of no more than 10 items for the short scale to ensure scale length could feasibility be integrated with larger surveys and existing data collection tools, and to retain at least two items for each of the three domains of the QCC construct to ensure coverage of the entire construct. Our second step was to generate an initial list of potential items to retain, including those that either had four or five votes from the five co-investigators or high (>0.4) factor loadings from prior studies, and excluding those with zero co-Investigator votes. Given our desire to develop a scale that could measure clients’ counseling experiences regardless of whether an individual decides to use a method, we also excluded items that focus exclusively on information about discontinuation and switching as those are less relevant for people who have not initiated method use. In our final step, we sought to remove additional items that were similar in content to other retained items or in order to reach our target number of 10 items.

2.4. Descriptive and psychometric analysis of reduced scale

We examined scale and item properties of the QCC-10 by country to examine validity and reliability across settings. We calculated mean item and scale scores to describe score distributions. We conducted exploratory factor analysis (EFA) to identify the factor structure of the reduced scale, identifying factors with an adjusted eigenvalue of at least one through parallel analysis. We assessed factor loadings once factor structure was determined. We calculated item-rest correlations to examine each item’s association with the score of the other items, and Cronbach’s alpha to examine internal consistency reliability of the scale. Because four
| Item abbreviation | Item* | Item consistent across countries (Y/N) | # votes (max = 5)$^b$ | Factor loading: QCC-Mexico (22 items total) | Factor loading: QCC-Ethiopia (26 items total) | Factor loading: QCC-India (23 items total) | Key reason selected or not selected for QCC-10 |
|-------------------|-------|----------------------------------------|------------------------|---------------------------------------------|-------------------------------------------------|---------------------------------------------|----------------------------------------------|
| QCC Construct: Information Exchange | opinion | During the contraception consultation, I was able to give my opinion about what I needed. | Y | 4 | 0.4–0.6 | 0.51 | 0.72 | Selected: High number of votes |
| personal | The provider asked me questions in order to provide counseling that fit my personal experience. I received complete information about my options for contraceptive methods. | N$^d$ | 3 | N/A | 0.63 | 0.63 | Selected: Concept of personalized counseling key component of QCC construct |
| info | | | Y | 2 | 0.6–0.7 | 0.51 | 0.42 | Selected: Concept of information receipt key component of QCC construct |
| explain | The provider knew how to explain contraception clearly. | N$^e$ | 0 | 0.6–0.8 | 0.64 | N/A | Not selected: Performed poorly in India, no votes |
| opportunity | I had the opportunity to participate in the selection of a method. | Y | 2 | 0.6–0.7 | 0.56 | 0.18 | Not selected: Performed poorly in India |
| sti_info | I received information about how to protect myself from sexually transmitted infections. | Y | 2 | 0.6–0.7 | 0.49 | 0.62 | Not selected: STI information receipt not central to QCC construct |
| method_fail | I received information about what to do if a method fails (e.g., broken condom, forget a pill, forgot injection appointment, feel an IUD is poorly placed) | Y | 3 | 0.6–0.7 | 0.73 | 0.60 | Not selected: item less relevant for clients who do not select a method |
| body_react | I could understand how my body might react to using contraception. | Y | 2 | 0.6–0.7 | 0.76 | 0.60 | Selected: Concept of side effect understanding central to QCC construct |
| method_use | I could understand how to use the method(s) we talked about during the consultation. | Y | 2 | 0.6–0.7 | 0.74 | 0.49 | Selected: Concept of understanding method use central to QCC construct |
| method_react | The provider explained to me what to do if I had a reaction to a method (e.g., allergies, nausea, pains, menstrual changes). | Y | 3 | 0.7 | 0.74 | 0.65 | Not selected: item less relevant for clients who do not select a method |
| method_stop | I received information about what to do if I wanted to stop using a method. | Y | 1 | 0.6–0.7 | 0.74 | 0.47 | Not selected: item less relevant for clients who do not select a method |

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Table 1 (continued)

| Item abbrev-iation | Item | Item consistent across countries (Y/N) | # votes (max = 5) | Factor loading: QCC-Mexico\(^b\) (22 items total) | Factor loading: QCC-Ethiopia (26 items total) | Factor loading: QCC-India (23 items total) | Key reason selected or not selected for QCC-10 |
|--------------------|------|---------------------------------------|------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| QCC Construct: Interpersonal Relations | | | | | | | |
| 12 info_private | I felt the information I shared with the provider was going to stay between us. | Y | 3 | 0.6–0.7 | 0.56 | 0.14 | Not selected: Performed poorly in India |
| 13 enough_time | The provider gave me the time I needed to consider the contraceptive options we discussed. | Y | 3 | 0.5–0.8 | 0.68 | 0.58 | Selected: Concept of informed decision-making central to QCC construct |
| 14 prov_friendly | The provider was friendly during the contraception consultation. | N\(^a\) | 2 | 0.8 | 0.65 | N/A | Not selected: Performed poorly in India |
| 15 prov_knows | I felt the health care provider had sufficient knowledge about contraceptive methods. | N\(^a\) | 0 | 0.8 | 0.70 | N/A | Not selected: Performed poorly in India, no votes |
| 16 prov_health | The provider showed interest in my health while we talked about contraception. | Y | 1 | 0.8 | 0.66 | 0.56 | Not selected: items 1 and 18 are similar and received more votes |
| 17 prov_opinion | The provider was interested in my opinions. | Y | 1 | 0.8 | 0.73 | 0.62 | Not selected: items 1 and 18 are similar and received more votes |
| 18 express_self | I felt encouraged to ask questions and express my concerns. | N\(^a\) | 4 | N/A | 0.75 | 0.68 | Selected: High number of votes |
| 19 prov_listens | I felt listened to by the provider. | Y | 1 | 0.7–0.8 | 0.70 | 0.59 | Not selected: items 1 and 18 are similar and received more votes |
| 20 no_interrupt | The provider made efforts to ensure there were no interruptions during our session. | N\(^a\) | 1 | N/A | 0.50 | 0.64 | Selected: Concept of privacy is central to the QCC construct |
| QCC Construct: Disrespect and Abuse | | | | | | | |
| 21 prov_insist | The health care provider pressured me to use the method they wanted me to use. | Y | 5 | 0.6 | 0.02 | 0.14 | Selected: high number of votes; despite low loadings in Ethiopia and India, absence of coercion is central to QCC construct |
| 22 prov_judge | I felt the provider treated me poorly because they tend to judge people. (Clothing, age, living condition, marital status, etc.) | Y | 0 | 0.7–0.8 | 0.46 | 0.43 | Not selected: No votes |
| 23 scold_age (or scold_use, in India) | I felt scolded because of my age. | N\(^a\) | 0 | 0.5 | 0.60 | 0.54 | Not selected: No votes |

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of the items selected for the final scale were not fielded in Mexico, our ability to examine psychometric properties of the scale in Mexico is limited; nonetheless we report on findings using the six available items from the QCC-10 that were fielded in Mexico. All analyses were conducted by country and using Stata version 15.

2.5. Convergent validity assessment

We assessed convergent validity (i.e., the degree to which QCC-10 scores correlate with other, similar measures, as expected) using an overall measure of client experience with the provider (dichotomized to highest rating vs all else) and a measure of whether the client planned to use or continue using the selected contraceptive method, among women who reported selecting or already using contraception on the day of interview. Analyses were conducted using bivariate logistic regression models, accounting for clustering (by provider in Mexico and site in India and Ethiopia where provider identifiers were unavailable) with robust standard errors.

3. Results

3.1. Item reduction

Table 1 displays all 26 QCC items, with investigator votes, factor loadings from prior validation studies, and descriptions of the rationale for selecting or excluding each item for the QCC-10 final item set. Items received between 0 and 5 votes (mean = 1.9, standard deviation = 1.3); only one item received five votes (prov_insist: “The health care provider pressured me to use the method they wanted me to use”).

Eighteen items were considered for retention either because they had four or five votes from the five co-investigators (n = 3) or high (>0.4) factor loadings from prior studies in combination with at least one vote from a co-investigator (n = 15). We excluded three items from the latter category that focus exclusively on information for individuals who select a method during counseling (method_fail, method_react, and method_stop). From the 15 remaining items, we excluded five deemed not essential for coverage of the QCC construct (STI_info because of the focus on STIs; prov_health, prov_opinion, and prov_listens due to their similarity to other items; and prov_sexlife due to its length). The final 10 QCC-10 items are presented in Table 2.

3.2. Descriptive and psychometric analysis of reduced scale

Table 3 presents item and scale properties of the QCC-10. As previously reported, item means ranged from 3.3-3.9 (out of 4) in Mexico, 2.4 to 4.0 in Ethiopia, and 3.0 to 3.9 in India. Overall QCC-10 scores ranged from 3.1 in Ethiopia to 3.5 in Mexico (six items only). Cronbach’s alpha was 0.8 in Mexico and Ethiopia, indicating high reliability for a short scale [14], while the alpha was only 0.5 in India. Missing data ranged from 10 per item in Mexico to 21 in Ethiopia; no data were missing in India.
### Table 2
Final Quality of Contraceptive Counseling short scale (QCC-10)²

| Please think about the interaction you just had with a health care provider about contraceptive options. According to this specific experience, answer the following series of questions. | Strongly disagree | Disagree | Agree | Strongly agree |
|---|---|---|---|---|
| 1. During the contraception consultation, I was able to give my opinion about what I needed. (opinion) *Spanish: Durante la consulta sobre métodos anticonceptivos, pude opinar sobre mis necesidades.* *Amharic: ከቼንንታት ደጋቤ ያስከ ያለው የሚከሸው በወርጊት ላይ ከርር እርጊት ይችላል።* *Gujarati: માણસેના બેગતા અનુભાવને અંદાજેટલી પરાભવ આપવા માટે કર્યાતાં મને બેગતા માટે પૂછ્યું.* | 1 | 2 | 3 | 4 |
| 2. The provider asked me questions in order to provide counseling that fit my personal experience. (personal) *Spanish: Ella la prestadora de servicios de salud me hizo preguntas para darme una orientación personalizada.* *Amharic: የተጋቢት ዓይነት የተጋቢት የሚገኝ ያስከ ያለው የሚከሸው የሚገኝ ላይ ከርር እርጊት ይችላል።* *Gujarati: માણસેના બેગતા અનુભાવને અંદાજેટલી પરાભવ આપવા માટે કર્યાતાં મને બેગતા માટે પૂછ્યું.* | 1 | 2 | 3 | 4 |
| 3. I received complete information about my options for contraceptive methods. (info) *Spanish: Recibí información completa sobre mis opciones para el uso de métodos anticonceptivos.* *Amharic: ከቼንንታት ደጋቤ ያስከ ያለው የሚከሸው በወርጊት ላይ ከርር እርጊት ይችላል።* *Gujarati: માણસેના બેગતા પ્લાનિંગ માટે વિચારો વિચાર મને સમૂહો માટે મળ્યો.* | 1 | 2 | 3 | 4 |
| 4. I could understand how my body might react to using contraception. (body_react) *Spanish: Pude entender las reacciones que podría tener mi cuerpo al usar un método anticonceptivo.* *Amharic: ከቼንንታት ደጋቤ ያስከ ያለው የሚከሸው በወርጊት ላይ ከርር እርጊት ይችላል።* *Gujarati: માણસેના બેગતા ઉપયોગ કરવાથી માણૂ દરીર કેવી પ્રભાવિતા આપી શકે છે તે કે સમૂહે જાતી હતી.* | 1 | 2 | 3 | 4 |
| 5. I could understand how to use the method(s) we talked about during the consultation. (method_use) *Spanish: Pude entender cómo usar el método o los métodos anticonceptivos de los que hablamos.* *Amharic: ከቼንንታት ደጋቤ ያስከ ያለው የሚከሸው በወርጊት ላይ ከርር እርጊት ይችላል።* *Gujarati: માણસેના બેગતા અને જે પહેલા વિચારે જાતી હતી, તેની ઉપયોગ કેવી રીતે કરવો તે કે સમૂહે જાતી હતી.* | 1 | 2 | 3 | 4 |

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|   | The provider gave me the time I needed to consider the contraceptive options we discussed. (enough_time) | 1 | 2 | 3 | 4 |
|---|------------------------------------------------------------------------------------------------------|---|---|---|---|
|   | Spanish: Senti que el/la prestadora de servicios de salud me daba el tiempo necesario para explorar mis opciones sobre métodos anticonceptivos. | 1 | 2 | 3 | 4 |
|   | Amharic: ከወላይ ንጉራ ከምትርክር በሚንገር በተለይ ወቅት መካከል ከሚስት እንደ የሆነ የካል። |   |   |   |   |
|   | Gujarati: जल्दी अभी यहाँ करी हती ते गर्मिनिशेष विकल्पोंचा गुगुरडीच्या बातची कर्याच्या म्हणे हजरी समय आपल्यो कि. |   |   |   |   |
|   | 7. I felt encouraged to ask questions and express my concerns. (express_self) |   |   |   |   |
|   | Spanish: Senti que el/la prestadora de servicios de salud me animó a hacer preguntas y expresar mis inquietudes. |   |   |   |   |
|   | Amharic: ከወላይ ከወራ ከምትርክር በሚንገር በተለይ ወቅት መካከል ከሚስት እንደ የሆነ የካል። |   |   |   |   |
|   | Gujarati: माझं प्रश्न घर अभियंता विकल्पोंचा घर ध्येय करु घरे म्हणे प्रश्नातिकरी करी हती जेवं म्हणे लोकांना घरां घरां. |   |   |   |   |
|   | 8. The provider made efforts to ensure there were no interruptions during our session. (no_interrupt) |   |   |   |   |
|   | Spanish: El/la prestadora de servicios de salud se aseguró de que no hubiera interrupciones durante la consulta. |   |   |   |   |
|   | Amharic: ከወላይ ከወራ ከምትርክር በሚንገር በተለይ ወቅት መካከል ከሚስት እንደ የሆነ የካል። |   |   |   |   |
|   | Gujarati: अभी विकल्पोंचा घर ध्येय करु घरे आमंत्रित न बादे ते म्हणे कर्याच्या प्रश्नांना करावा मागतांना घरा. |   |   |   |   |
|   | 9. The health care provider pressured me to use the method they wanted me to use. (prov_insist) |   |   |   |   |
|   | Spanish: El/la prestadora de servicios de salud me insistió para usar el método anticonceptivo que él/ella quería. |   |   |   |   |
|   | Amharic: ከወላይ ከወራ ከምትርክር በሚንገር በተለይ ወቅት መካከል ከሚስት እንደ የሆነ የካል። |   |   |   |   |
|   | Gujarati: आमंत्रित विकल्पोंचा घर ध्येय करू घरे तेज पद्धतिनी उपयोग करू घरे तेज विकल्पोंचा घर ध्येय करावा मागतांना घरा. |   |   |   |   |
|   | 10. I felt scolded because of my marital status. (scold_marital) | 1 | 2 | 3 | 4 |
|   | Spanish: Me senti regañada por mi estado civil. |   |   |   |   |
|   | Amharic: ከወላይ ከወራ ከምትርክር በሚንገር በተለይ ወቅት መካከል ከሚስት እንደ የሆነ የካል። |   |   |   |   |
|   | Gujarati: माझं विवाहित विवेक जतने घर ध्येय म्हणे घरांच्या घरां. |   |   |   |   |

* In India, where clients were surveyed within 2 weeks of their visit, this was phrased “the most recent interaction.”
EFA revealed a clear one-factor solution in each country, as only one factor in each country had an adjusted eigenvalue greater than one in parallel analysis (Appendix). Factor loadings were consistently above 0.4 for all but two items: prov_insist and scold_marital. The prov_insist item, examining provider pressure to use a specific method, loaded 0.2 in Mexico, 0.1 in Ethiopia, and met the 0.4 threshold in India. Similarly, the scold_marital item, reflecting biased counseling against client's pursuit of contraceptive methods based on their marital status, loaded 0.3 in Ethiopia and 0.1 in India; the item was not fielded in Mexico. Item-rest correlations were also low (< 0.4) for these two items. Because these two items capture key dimensions of negative counseling experiences, we retained them to preserve content validity of the scale in line with the original measurement framework [6]. However, due to the low alpha in India, we conducted a sensitivity analysis removing both scold_marital and prov_insist; this improved the alpha in India to be comparable to Ethiopia and Mexico (0.8) and increased the info factor loading to 0.5. We also conducted a sensitivity analysis to evaluate if item and scale properties would improve if just scold_marital was removed; results indicated that item loadings and Cronbach's alpha did not substantially change (Table 3).

3.3. Convergent validity

Table 4 displays results from convergent validity analyses. QCC-10 scores were highly correlated with a dichotomous overall measure of client experience in all countries (Mexico: OR = 10.6, 95% CI = 5.7–19.6; Ethiopia: OR = 45.5, 95% CI = 23.6–87.7; India: OR = 4.4, 95% CI = 1.8–11.0). Note that the confidence intervals for these analyses are large likely due to clustering of standard errors, particularly in Ethiopia and India where data were collected at the site rather than provider level. We conducted a sensitivity analysis to examine the relationship of an 8-item version of the scale, removing the two negatively worded items that capture disrespect and abuse (prov_insist and scold_marital) and that were less commonly endorsed among participants, and found scores remained highly correlated with the client experience measure (Mexico: OR = 7.0, 95% CI = 4.2–11.8; Ethiopia: OR = 30.7, 95% CI = 15.4–60.9; India: OR = 3.2, 95% CI = 1.5–6.7).

Among participants who selected a method after their contraceptive counseling visit, there was also correlation between QCC-10 scores and clients' reported intention to initiate the method (Mexico: OR = 3.3, 95% CI = 1.7–6.4; Ethiopia: OR = 3.5, 95% CI = 2.5–4.9). A sensitivity analysis removing prov_insist and scold_marital did not meaningfully change the finding (Mexico: OR = 2.4, 95% CI = 1.3–4.2; Ethiopia: OR = 2.3, 95% CI = 1.6–3.2). We did not conduct this analysis for India, as participants initiated a method by the interview given our recruitment approach, conducting interviews within 2 weeks after the consultation.

4. Discussion

This study describes the process used to reduce 26 items of the multidimensional Quality of Contraceptive Counseling (QCC) scale, measuring client experience of contraceptive counseling, to a unidimensional 10-item scale using data from contraception clients in Mexico, Ethiopia, and India. The QCC-10 offers a new approach to measuring client experience and fulfillment of human rights in medicine.
contraceptive counseling that is appropriate for multiple cultural contexts, including geographies in Latin America, South Asia, and sub-Saharan Africa. The scale's strength lies in the robust formative research conducted to develop the original items [11–13] and the three-continent survey data leveraged for the scale reduction. The original QCC-Mexico, QCC-Ethiopia, and QCC-India scales are multidimensional, comprising three subscales: information exchange, interpersonal relationship, and disrespect and abuse. The QCC-10 is a shorter, unidimensional scale that retains items from these three subscales (five, three, and two items for each subscale, respectively) and includes content coverage of the original measurement framework [6].

The QCC-10 retained the high internal consistency reliability observed in the QCC-Mexico and QCC-Ethiopia validation studies, even with the lack of data for four items in Mexico. However, Cronbach's alpha was notably lower among women in India (alpha = 0.5, not typically considered acceptable) [14]. Despite clear evidence from EFA that the QCC-10 in India was unidimensional, this low alpha likely indicates heterogeneity in what individual scale items measure. The two items reflecting disrespect and abuse (prov_insist and scold_marital) had the lowest factor loadings in India. We hypothesize these items are responsible for the lower alpha, possibly because they capture a different aspect of quality—focused on understudied, negative experiences—relative to the positively-worded items in the information exchange and interpersonal relationship domains, which loaded 0.4 or higher. Indeed, the removal of the two items in India increased the scale reliability (alpha = 0.8; Table 3). The poor performance of the QCC-10 in India suggests the need for further exploration of its suitability in this context. We recommend that future work examine the performance of the prov_insist and scold_marital items in a larger, more diverse sample from India. Given the importance of the provider bias and discrimination items from a content validity perspective, including positive and negative dimensions of care in measures such as the QCC-10 is central to comprehensive assessment of high-quality contraceptive services.

Convergent validity findings offer promising evidence for the QCC-10's construct validity with higher scale scores correlating with anticipated client outcomes (e.g., overall measure of client experience and intention to use/continue method use) across settings. Future research should examine the transferability and psychometric properties of the QCC-10 in other low- and middle-income countries to examine the validity and reliability of the QCC-10 in other contexts and assess if our observed measurement challenges are unique to the Indian study context or exist across geographies. We also recommend future validation studies include nonresponse analyses to examine the minimum number of items required to retain psychometric properties. Further, researchers may choose to explore other ways to score the QCC-10 in their work. Mean scoring was chosen by the QCC project team for the original long-form validation studies and for this reduction study, given the prioritization of facilitating QCC-10 score calculations in clinical contexts. In contexts where more complex score calculation is possible, however, other approaches may be valuable to explore.

The QCC-10 complements other recently developed measures of quality in contraceptive counseling, including the Interpersonal Quality in Family Planning (IQFP) scale (developed and validated in the United States and validated for use in India [15,16]) and its reduced version, the Person-Centered Contraceptive Counseling (PCCC) scale [17]; and the Method Information Index (MI) and MI-Plus, developed from existing survey items used for decades as part of the Demographic Health Surveys [18]. The IQFP is an 11-item scale similar in length to the QCC-10, focuses on person-centeredness in contraceptive counseling, yet, the QCC-10 is distinct in the scope of the construct measured; specifically the QCC-10 comprises domains of privacy, confidentiality, and non-discrimination not covered in the IQFP and includes items probing for negative experiences, such as pressure to use contraception. While the PCCC and MI are both shorter measures that can be easily integrated into surveys, compared to the IQFP and QCC-10, they also offer less nuance in measuring quality of counseling. Similarly, with simple yes/no response options and a focus on counseling content, not experience, MI/MI-Plus data result in less response variation than other available measures, which utilize Likert scales for responses; such homogeneity has proven challenging from a research perspective. An important and foundational benefit of the QCC-10 relative to these other measures is the robust, formative research and cognitive testing that was conducted in the three settings during the item refinement phase; such efforts were critical to ensuring content validity in each new setting before quantitatively testing the items [9–13].

This study was limited by the narrow geographic scopes included in each of the original QCC validation studies (two states in Mexico, the capital city of Ethiopia, and one state in India). Despite this, the QCC-10 is unique in that it was developed with data from three diverse settings. Additionally, as part of the reduction process, we prioritized information exchange items relevant to selection of a method and excluded several items that focus exclusively on information about discontinuation and switching among contraceptive method users, given our desire to develop a scale that could measure clients' counseling experiences regardless of whether they decide to use a method. Thus, the resulting QCC-10, compared to the longer, country-specific QCC scales, covers a limited scope of the entire information exchange component of the original measurement framework [6]. Finally, the data sources used for Ethiopia and India do not include provider identifiers and, thus, we are unable to account for clustering of women's experiences by provider in our Ethiopia and India analyses.

The QCC-10 offers an innovative, cross-cultural approach to measuring quality in contraceptive counseling. Future efforts should examine its validity and reliability for use globally, with additional exploration of how to best measure negative aspects of care in India where the QCC-10 Disrespect and Abuse items were problematic. Thoughtful, nuanced measurement of client perspectives on the counseling they receive, available via the QCC-10, is critical to monitoring and improving quality of care and the fulfillment of human rights in contraceptive services worldwide.

Data availability

Data will be available on Dryad.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix

India
References

[1] World Health Organization. Framework for ensuring human rights in the provision of contraceptive information and services. 2014. [https://apps.who.int/iris/bitstream/handle/10665/133327/?sequence=1] Accessed 2 November 2022.

[2] Bruce J. Fundamental elements of the quality of care: a simple framework. Stud Fam Plann 1990;21(2):61–91.

[3] Stairs AM, Ezeh AC, Barker G, Basu A, Bertrand JT, Blum R, et al. Accelerate progress—sexual and reproductive health and rights for all: report of the Guttmacher-Lancet Commission. Lancet. 2018;391(10140):2642–92.

[4] Crossing the quality chasm: a new health system for the 21st century | The BMJ [Internet]. [Available from: https://www.bmj.com/content/323/7322/1192.1.full] Accessed November 19, 2021

[5] Kruk ME, Gage AD, Arsenault C, Jordan K, Leslie HH, Roder-DeWan S, et al. High-quality health systems in the Sustainable Development Goals era: time for a revolution. Lancet Glob Health 2018;6(11):e1196–252.

[6] Holt K, Dehlendorf C, Langer A. Defining quality in contraceptive counseling to improve measurement of individuals’ experiences and enable service delivery improvement. Contraception 2017;96(3):133–7.

[7] “Measuring quality of care: A review of previously used methodologies a” by Katherine Tuminson [Internet]. Available from: https://knowledgecommons.popcouncil.org/departments_sbsr-rh/679/. Accessed August 19, 2021

[8] Jain AK, Hardee K. Revising the FP Quality of Care Framework in the context of rights-based family planning. Stud Fam Plann 2018;49(2):171–9.

[9] Holt K, Zavala I, Quintero X, Hessler D, Langer A. Development and validation of the client-reported quality of contraceptive counseling scale to measure quality and fulfillment of rights in family planning programs. Stud Fam Plann 2019;50(2):137–58.

[10] Holt K, Gebrehanna E, Sarnaik S, Lakhwani K, Reed R, Yesuf A, et al. Adaptation and validation of the quality of contraceptive counseling (QCC) scale for use in Ethiopia and India. Rev Plos One.

[11] Holt K, Zavala I, Quintero X, Mendoza D, McCormick MC, Dehlendorf C, et al. Women’s preferences for contraceptive counseling in Mexico: Results from a focus group study. Reprod Health 2018;15(1):128.

[12] Gebrehanna E, Langer A, Holt K. Women’s experiences with and preferences for contraceptive counseling in Addis Ababa, Ethiopia: Results from a qualitative study. Rev Plos One.

[13] Understanding quality of contraceptive services from women’s perspectives in Gujarat, India: a focus group study | BMJ Open [Internet]. Available from: https://bmjopen.bmj.com/content/11/10/e049260.abstract. Accessed November 19, 2021

[14] DeVellis RF. Scale development: Theory and applications. 26. Thousand Oaks, California: Sage publications; 2016.

[15] Dehlendorf C, Henderson JT, Vittinghoff E, Steinauer J, Hessler D. Development of a patient-reported measure of the interpersonal quality of family planning care. Contraception 2018;97(1):34–40.

[16] Johns NE, Dixit A, Ghule M, Begum S, Battala M, Kuly G, et al. Validation of the interpersonal quality of family planning scale in a rural indian setting. 2. Contracept X; 2020.

[17] Dehlendorf C, Fox E, Silverstein IA, Hoffman A, Campora Perez MP, Holt K, et al. Development of the person-centered contraceptive counseling scale (pccs), a short form of the interpersonal quality of family planning care scale. Contraception 2021;103(5):310–15.

[18] Jain AK. Examining progress and equity in information received by women using a modern method in 25 developing countries. Int Perspect Sex Reprod Health 2016;42(3):131–40.