Development and validation of a questionnaire (QSPC-Q) for assessment of quality and strengthening of primary care in Brazil

Desenvolvimento e validação de um questionário (QSPC-Q) para avaliação da qualidade e fortalecimento da atenção primária no Brasil

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Abstract *The performance evaluation of services through instruments is relevant, as it can support thoughts, actions and political approaches to meet a social need. The objective of the article was to develop and validate the Quality and Strengthening of Primary Care Questionnaire (QSPC-Q) for professionals and users based on Starfield attributes and Donabedian pillars. A mixed sequential study was performed to develop the QSPC-Q. The test was applied to 149 doctors and 795 users of basic health units. Psychometric properties was assessed by testing internal consistency using Cronbach's alpha and exploratory factor analysis. Reproducibility od scale was assessed using intraclass cognitive and test-retest correlation. The final version of the follow-up consisted of 45 items aimed at physicians (Cronbach's alpha = 0.921) and 33 at users (Cronbach's alpha = 0.86); the intraclass respiratory capacity was 0.88. An exploratory factor analysis identified 13 factors associated with the pattern components. A short version with 29 items for professionals was also elaborated. Professional QSPC-Q (short and braided versions) and user QSPC-Q were valid.*
Key words *Primary care, Quality of health care, Validation studies*

Resumo *A avaliação do desempenho dos serviços por meio de instrumentos é relevante, pois pode subsidiar pensamentos, ações e abordagens políticas para atender a uma necessidade social. O objetivo do artigo foi desenvolver e validar o Questionário de Qualidade e Fortalecimento da Atenção Primária (QSPC-Q) para profissionais e usuários com base nos atributos Starfield e nos pilares donabedianos. Um estudo sequencial misto foi realizado para desenvolver o QSPC-Q. O teste foi aplicado em 149 médicos e 795 usuários de unidades básicas de saúde. As propriedades psicométricas foram avaliadas testando a consistência interna usando o alfa de Cronbach e a análise fatorial exploratória. A reprodutibilidade da escala foi avaliada por meio da correlação cognitiva intraclasse e teste-reteste. A versão final do questionário foi composta por 45 itens direcionados a médicos (alfa de Cronbach = 0,921) e 33 a usuários (alfa de Cronbach = 0,86); o coeficiente de correlação intraclasse foi de 0,88. A análise fatorial exploratória identificou 13 fatores associados aos componentes do questionário. Também foi elaborada uma versão curta com 29 itens para profissionais. O QSPC-Q profissional (versões curta e estendida) e usuário foram válidos.*
Palavras-chave *Atenção primária, Qualidade da atenção à saúde, Estudos de validação*

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Background

Primary care in Brazil is a network of health promotion and prevention services that identifies the needs and coordinates care[1]. It is also the first contact of the population with the health system and attends to the most frequent and less complex grievances[2]. Considering that the evaluative process may support reflections and actions or even assume a political dimension to reach social needs, studies reinforce the need to assess the performance of health services using adequate instruments, especially because of the relevance of assessing the presence and extent of primary care attributes. However, the scope and applicability of scales are still limited to assessing the strengthening of primary care[3,4].

The Primary Care Assessment Tool (PCA-Tool), created by Barbara Starfield[5] between 1997 and 2001, identifies and monitors the quality of primary care services in Brazil and contributes to comparative studies between Primary Health Care Units[6,7]. For a period, the National Program for the Improvement of Access and Quality of Primary Care (PMAQ-AB) was used to assess the quality of primary care[8,9], a normative and self-assessment instrument applied to health managers and workers to improve primary care[8,9]. The PMAQ-AB has also been used to encourage managers and teams to improve the quality of health services offered in primary care, ensuring the equivalence of standards at the national, regional and local levels[10]. The Quality Assessment Questionnaire for Primary Care Services, QualiAB, also stands out for its online and self-administered usability by managers and health teams in the quest to develop mechanisms to encourage improvement in the quality of Primary Care[11]. However, these instruments have been criticized due to their length, lack of validation or psychometric inconsistencies.

In this sense, the evaluative process must support reflections and actions and create political conditions to change the sanitary reality[12-14]. Although studies have demonstrated the need to adequately assess health services[6,8,14-16], some challenges remain (e.g., limitations in coverage and applicability of questionnaires to assess primary care). Therefore, we aimed to create and validate a simple instrument for physicians and users to assess the strengthening of primary care based on Donabedian's model of quality assessment[17] and Starfield's attributes for primary health care[5]. Therefore at this stage was aimed to report the quantitative phase of the validation process.

Methods

This is a mixed sequential quali-quant study of the development and validation of instruments. This study was approved by the research ethics committee of the Instituto de Medicina Integral Professor Fernando Figueira (CAAE 698495517.3.0000.5201) and conducted according to the Declaration of Helsinki. All participants (users and professionals) signed the informed consent form before data collection.

The validation process started with a qualitative phase that aimed to develop the construct discussed here, in order to do it a systematic literature review and a validation of face was made. The face validation process was carried out with professionals who are experts in the Family and Community Health Strategy (ESFC), based on the consensus of the Nominal Group Technique (TGN), proposed by Jones and Hunter[18]. Based on this validated matrix (Chart 1), which left 24 indicators related to the principles and attributes of primary care and the pillars of quality, a research instrument was developed with a view to analyzing the quality and strengthening of primary care, called Quality and Strengthening of Primary Care Questionnaire (QSPC-Q). Two versions of the QSPC-Q (professionals and users) were applied to 149 physicians and 795 users of 147 BHU from 23 municipalities in the state of Pernambuco.

The validation process was conducted according to universal methodology Streiner and Norman[19] and followed recommendations to the Consensus-based Standards for the selection of health Measurements Instruments to guided work (COSMIN)[20] to quality assurance evaluation. The use of COSMIN showed that our study use a classical theory of validation therefore not all items applied for; nonetheless regarding the box F, item 7 it should take into account that we use the strategy to apply the similar scales for different socials actors such as health service user's and professionals as strategy to access convergent validity.

In the quantitative analysis, we validated the questionnaire using Cronbach's alpha coefficient, item-total correlation, and intraclass correlation coefficient. The Kaiser-Meyer-Olkin index, Bartlett Sphericity Test, the Factor Exploratory analysis and the measure of sampling adequacy were also conducted.

Chart 1. Consensus level of the nominal group.

Indicator	Consensus among responses in the first round	Consensus after in-person meeting
Attending scheduled and spontaneous demand	90%	100%
Reception, risk classification, health needs assessment, and vulnerability analysis	60%	100%
Priority attention to risk groups and patients with clinical or behavioral risk factors	60%	87.50%
Territorialization and mapping of the area where BHU teamsoperate	90%	100%
Adscription of patients, bonding, and accountability	80%	100%
Qualified listening	60%	87.50%
Follow-up of vulnerable patients or those with diseases orconditions sensitive to primary care	80%	100%
Prenatal and postpartum care	90%	100%
Consultation with identification and registration of all healthand socio-environmental vulnerability issues	40%	87.50%
Referral to specialized care	60%	100%
Home care for patients with controlled or compensated health problems and physical difficulties or impossibilities	60%	100%
Educational activities for promotion and prevention in the FHU, households, and community.	70%	87.50%
Active surveillance	50%	87.50%
Patient and family registration in the food supplementationprogram	20%	-
Articulation between the team, traditional caregivers, FHSC,and other levels of care	50%	100%
Organization of medical records and agenda in the FHU.	90%	100%
Epidemiological diagnosis of the territory with the MunicipalHealth Department to identify problems and schedule consultations	30%	75%
Monitoring and analysis of health indicators and information	50%	100%
Planning meetings with the FHS to manage and organize thework process of the team (self-assessment)	80%	100%
Requirement of medical records and previous exams frompatients	20%	100%
Permission for patients to consult their medical records	40%	37.50%
Monitoring of the written information exchanged betweenreferral and counter-referral services	50%	87.50%
Holding meetings to discuss community health issues, monitoring of indicators, social control, satisfaction, and thecommunication channel with the leaders.	60%	75%
Orientation of conduct according to community needs andprofile	90%	100%
Conduction of home visits to discuss health or family issues of the patient, discuss or question the family history, and plan the treatment	30%	87.50%
Knowledge and respect for the beliefs, customs, and traditionsof communities, rural populations, settlers, quilombolas, and indigenous people	90%	100%

BHU: Basic Health Unit; FHU: Family Health Unit; FHSC: Family Health Support Centers; FHS: Family Health Strategy.

Source: Authors.

Quantitative analysis

The responses of 149 physicians and 795 users were used in the quantitative analysis. Astratified probability sample was calculated based on the population of municipalities and healthmacroregions of the state of Pernambuco and the number of participants linked to BHU. The selection

of professionals and users was paired in these municipalities, considering all BHUs covered or not by physicians of the More Doctors Program. BHUs composed of physicians of both profiles were also searched at the same stage.

The inclusion criteria considered physicians working at least six months in the Family Health Strategy team, whereas users should have > 18 years old and at least two appointments with the selected physicians; the questionnaire should be applied on the same day of the visit. Those who refused to sign the informed consent form or did not finish the questionnaire were excluded.

The questionnaire was validated using the following psychometric analyses[21-24]: Cronbach's alpha, item-total correlation, and intraclass correlation coefficient. The multidimensionality of the questionnaire was verified and reduced using exploratory factor analysis (principal axis factoring method). The extraction of factors was performed using varimax orthogonal rotation, and items were included in factors if they presented a factorload > 0.300[22].

Construct validity

The Kaiser-Meyer-Olkin index and Bartlett's sphericity tests were also analyzed for the factor analysis[23,24]. The measure of sampling adequacy was conducted for the primary care characterization. Cronbach's alpha assessed internal consistency; values > 0.70 (or > 0.20 for corrected item-total correlation) were considered adequate. The Kolmogorov-Smirnov test assessed data normality, and statistical significance was set at 5%[25].

Convergent validity

It was calculated cores – QSPC-Q professional and user versions. Responses to the QSPC-Q items ranged between 1 and 5 (1 considered the worst situation and 5 the best situation). Scores were transformed to a scale ranging from 0 to 10 to facilitate comparisons[21].

The Bland-Altman plot analyzed the concordance[21], and Pearson's correlation coefficient analyzed correlations between the short (29 items) and extended (45 items) versions of the QSPC-Q professionals. Data were analyzed using SPSS version 28.0.1.1 (IBM Corp, USA) and Rstudio version 4.0.0.

Results

The study was carried out using the classical test theory (CTT). At the stage of face validity fourteen items were excluded from the initial QSPC-Q professionals due to a lack of association with conceptual domains. In this sense, the final questionnaire comprised 45 items distributed as follows: one in first-contact care, five in longitudinality, eight in comprehensiveness, 20 in coordination, ten in family and community orientation, and one in cultural competence.

The internal consistency and convergent validitywas assessed using COSMIN recommendation and results showed satisfactory. The standardized Cronbach's alpha was 0.943 (Table 1). The mean total score of the QSPC-Q professionals was 147.99, considering the 5-point Likert scale. The short version of the QSPC-Q professional included 29 items and presented a Cronbach's alpha of 0.898.

Regarding the QSPC-Q for users, three items were excluded due to lack of associations with conceptual domains. Thus, the questionnaire comprised 33 questions distributed in sixattributes. The standardized Cronbach's alpha was 0.86. The mean total score of the QSPC-Quser was 105.33, considering the 5-point Likert scale. Nonetheless, the user scale will be discussed in detail in a future study due to the limited number of words requested by the journal.The respective mean scores of attributes in the extended and short versions were 7.81 and 8.37 (longitudinality), 6.21 and 6.01 (comprehensiveness), 5.54 and 4.86 (coordination), and 5.18 and 5.36 (family and community orientation). The concordance was also assessed using the Bland-Altman plot and Pearson's correlation coefficient (Figure 1). Only one item was included in the first-contact care and cultural competence attributes of both versions.

Following the COSMIN recommendations was calculated test-retest reliability and intra-rater reliability, was observed adequate reliability (test-retest) in 88% of items using 10% of the sample. Value for the Kaiser-Meyer-Olkin index of the QSPC-Q professionals was 0.872, while Bartlett'ssphericity test was significant (p < 0.01) and communality (h^2) > 0.5. In addition, was analyzed the structural validity of scale by testing its the dimensionality using explanatory factor analysis. The factor load of the QSPC-Q professionals was > 0.300 (13 factors with eigenvalues > 1 and accumulated varianceof 69.53%).

**Table 1.** Reliability and internal consistency analysis of the questionnaire – professional.

Variables	Average if the item is deleted	Variance if the item is deleted	Corrected item-total correlation	Cronbach's alpha if the item is deleted
1. First-contact care				
16. Frequency of participation in the reception	202.71	802.48	0.472	0.919
2. Longitudinality				
19. Participation in mapping socio-environmental vulnerability issues of the community	203.03	805.70	0.547	0.919
24. Assessment of attendance in groups for hypertension and diabetes	202.10	812.93	0.382	0.920
26.Frequency of participation of the professional in groups for hypertension and diabetes	202.14	813.70	0.347	0.920
29. Professional participation in recognizing the importance of the BHU for the population	201.54	826.80	0.256	0.921
37. Classification of the impact of requesting medical records and previous exams on medical practice	202.07	825.88	0.220	0.921
3. Comprehensiveness				
14. Percentage of time dedicated to procedures (other than medical consultations)	203.44	806.16	0.231	0.922
21. Analysis of the card for children under five years old (vaccine and growth curves)	202.32	803.59	0.459	0.919
23. Weight and blood pressure assessment in adults	202.10	817.39	0.233	0.921
27. Frequency of prenatal care	202.10	819.71	0.257	0.921
28. Average percentage of postpartum consultations in the last six months	203.88	784.60	0.567	0.918
34. Percentage of referrals to a specialist in the last six months	203.08	825.61	0.204	0.921
35. Percentage of patients who return from the specialist for follow-up at the Basic Health Unit	203.62	811.46	0.345	0.920
41. Frequency of home visits or consultations in the last six months	202.03	820.68	0.289	0.920
4. Coordination				
20.1. Participation in the discussion of risk classification of micro areas in the last six months	202.82	789.34	0.653	0.917
20.2. Participation in team meetings to discuss community issues in the last six months	202.13	798.20	0.655	0.918
20.3. Participation in the creation of the diagnosis map in the last six months	203.18	777.58	0.743	0.916
20.4. Participation in the health situation room in the last six months	203.24	791.77	0.499	0.919
20.5. Participation in community discussions about health issues in the last six months	202.53	796.99	0.579	0.918
20.6. Participation in joint work with the secretariat to schedule specialized consultations in the last six months	202.90	800.46	0.389	0.920
20.7. Participation in the follow-up of deaths of children under one-year-old and maternal deaths in the last six months	203.54	805.20	0.316	0.921
20.8. Participation in the registration of micro areas in the last six months	204.11	792.33	0.539	0.918
20.9.Participation in the follow-up of preterm children and neonatal and maternal near-miss in the last six months	203.10	792.13	0.476	0.919
20.10. Participation in active surveillance activities in the last six months	202.62	795.33	0.545	0.918

Table 1. Reliability and internal consistency analysis of the questionnaire – professional.

Variables	Average if the itemis deleted	Variance if the item is deleted	Corrected item-total correlation	Cronbach's alpha if the item is deleted
36. Frequency of requesting medical records and previous exams in the last six months	202.27	822.92	0.244	0.921
38. Frequency of use of the form for referral to the specialist in the last six months	202.40	823.24	0.203	0.921
39. Frequency of counter-referral forms received in the last six months	204.39	823.25	0.224	0.921
44.1. Frequency of articulation activities with the team in the last six months	201.89	807.87	0.526	0.919
44.2. Frequency of articulation activities with traditional caregivers in the last six months	203.35	797.26	0.464	0.919
44.3. Frequency of articulation activities with Family Health Support Center professionals in the last six months	203.27	799.15	0.455	0.919
44.4. Frequency of articulation activities with professionals from other levels of care in the last six months	203.44	808.42	0.359	0.920
45. Frequency of epidemiological diagnosis of the territory with the Municipal Health Department in the last sixmonths	203.97	797.59	0.523	0.919
47. Frequency of participation in planning meetings with the Family Health Strategy to manage and organize the work process in the last six months	203.09	799.40	0.505	0.919
48. Frequency of participation in self-assessment meetings in the last six months	203.59	805.05	0.399	0.920
5. Family and community orientation				
32. Frequency of invitations to participate in local activities in the last six months	202.94	799.88	0.460	0.919
42. Frequency of participation in educational activities in schools, daycare centers, shelters, or churches in the last six months	203.07	823.24	0.203	0.921
43.1. Participation in external educational activities on family planning in the last six months	203.24	785.49	0.678	0.917
43.2. Participation in external educational activities on prevention of sexually transmitted diseases in the last six months	202.90	788.94	0.652	0.917
43.3. Participation in external educational activities on oral health in the last six months	203.81	791.01	0.550	0.918
43.4. Participation in external educational activities on nutrition in the last six months	203.23	786.86	0.617	0.918
49.1. Participation in meetings to discuss community health issues in the last six months	202.57	788.13	0.684	0.917
49.2. Participation in meetings for monitoring indicators in the last six months	203.10	779.42	0.739	0.916
49.3. Participation in social control activities in the last six months	203.53	779.26	0.716	0.917
49.4. Participation in dialogues with community leaders to assess satisfaction in the last six months	203.75	774.26	0.748	0.916
6. Cultural competence				
51. Classification of the importance of incorporating knowledge about community beliefs and customs in medical practice	202.60	814.97	0.276	0.921

Source: Authors.
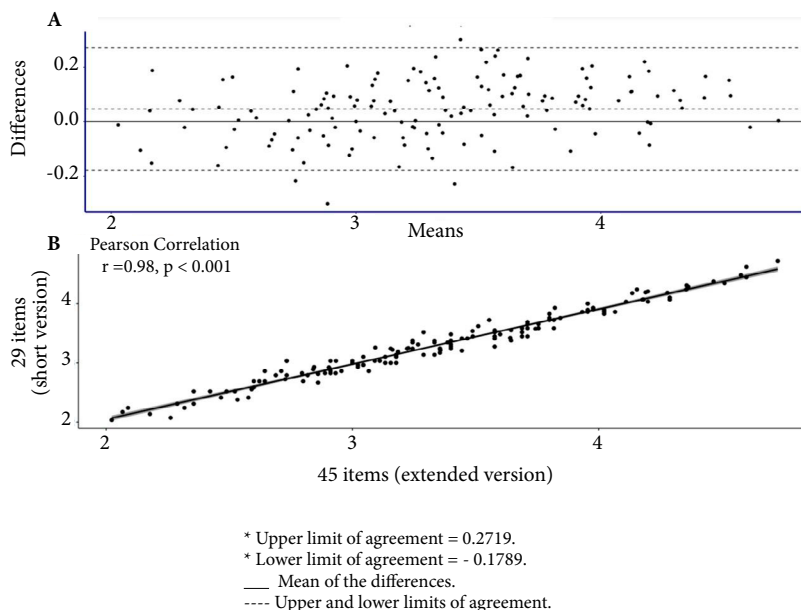
Figure 1. Concordance (Bland-Altman plot – A) and correlation (Pearson's correlation – B) between the short andextended versions of the questionnaire.

Source: Authors.

We observed that nine items of the QSPC-Q professionals demonstrated a valid factor load in factor 1, six in factor 2, four in factor 3, three in factor 4, four in factor 5, three in factor6, four in factor 7, four in factor 8, two in factor 9, one in factor 10, two in factor 11, two in factor 12, and one in factor 13 (Table 2).

Regarding the interpretability of scale it was described the percentage of items and tested to look explanatory associations and mean difference for some demographic variables such as gender, time since graduation, nature of employment and if they have a post graduate program.

Discussion

The study presented a valid and reproducible scale to assess the quality and strengthening of primary health care by professionals and users.

The instruments developed by Mackinko and Almeida[26] were used for a rapid evaluation of primary care in 2006. As of 2011, despite the wide coverage of the PMAQ-AB, the periodicity of the evaluation is criticized, in addition to the low transparency, lack of validation and inclusion of several variables for the evaluation of each team of the Family HealthStrategy[27].

The PCATool is the most used instrument, valid in many countries, sensitive to the structure and processes of primary care services, and has adequate and recognized psychometric properties. However, some difficulties were observed in the PCATool version forBrazilian adults[14-16,28]. For example, although some items did not reach the minimal factor load and the item-total correlation was below the recommended value to be included in the instrument, they were maintained due to their "extreme conceptual relevance" and concordance with the original instrument[15].

The idea to develop and validate another instrument to assess the quality and strengthening of primary care was reinforced by gaps and inadequate aspects of the instrumentsalready in use. Therefore, we created the QSPC-Q with reliable psychometric measures for adultusers and professionals.

Table 2. Factor analysis of the questionnaire applied to the professionals.

Attribute number*	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
4	20.10. Participation in active surveillance activities in the last six months	0.387												
5	49.4. Participation in dialogues with community leaders to assess satisfaction in thelast six months	0.449												
5	49.3. Participation in social control activities in the last six months	0.457												
5	49.2. Participation in meetings for monitoring indicators in the last six months	0.469												
5	42. Frequency of participation in educational activities in schools, daycare centers,shelters, or churches in the last six months	0.554												
5	43.1. Participation in external educational activities on family planning in the last sixmonths	0.753												
5	43.2. Participation in external educational activities on prevention of sexually transmitted diseases in the last six months	0.762												
5	43.4. Participation in external educational activities on nutrition in the last sixmonths	0.804												
5	43.3. Participation in external educational activities on oral health in the last sixmonths	0.807												
4	20.2. Participation in team meetings to discuss community issues in the last sixmonths		0.430											
4	20.1. Participation in the discussion of risk classification of micro areas in the last six months		0.441											
5	32. Frequency of invitations to participate in local activities in the last six months		0.444											
4	44.1. Frequency of articulation activities with the team in the last six months		0.483											
5	49.1. Participation in meetings to discuss community health issues in the last sixmonths		0.511											
1	16. Frequency of participation in the reception		0.662											
4	20.6. Participation in joint work with the secretariat to schedule specializedconsultations in the last six months			0.409										

it continues

Table 2. Factor analysis of the questionnaire applied to the professionals.

Attribute number*	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
4	45. Frequency of epidemiological diagnosis of the territory with the Municipal Health Department in the last six months			0.613										
4	47. Frequency of participation in planning meetings with the Family Health Strategyto manage and organize the work process in the last six months			0.681										
4	48. Frequency of participation in self-assessment meetings in the last six months			0.712										
4	20.8. Participation in the registration of micro areas in the last six months				0.489									
4	20.9. Participation in the follow-up of preterm children and neonatal and maternalnear-miss in the last six months				0.745									
4	20.7. Participation in the follow-up of deaths of children under one-year-old andmaternal deaths in the last six months				0.807									
3	23. Weight and blood pressure assessment in adults					0.414								
2	29. Professional participation in recognizing the importance of the BHU for thepopulation					0.501								
2	26. Frequency of participation of the professional in groups for hypertension anddiabetes					0.742								
2	24. Assessment of attendance in groups for hypertension and diabetes					0.744								
4	44.2. Frequency of articulation activities with traditional caregivers in the last sixmonths						0.685							
4	44.3. Frequency of articulation activities with Family Health Support Centerprofessionals in the last six months						0.699							
4	44.4. Frequency of articulation activities with professionals from other levels of carein the last six months						0.735							
4	38. Frequency of use of the form for referral to the specialist in the last six months							0.388						
2	19. Participation in mapping socio-environmental vulnerability issues of the community							0.467						

it continues

Table 2. Factor analysis of the questionnaire applied to the professionals.

Attribute number*	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
4	20.3. Participation in the creation of the diagnosis map in the last six months								0.546					
4	20.4. Participation in the health situation room in the last six months								0.707					
3	35. Percentage of patients who return from the specialist for follow-up at the BasicHealth Unit									0.510				
3	41. Frequency of home visits or consultations in the last six months									0.515				
2	37. Classification of the impact of requesting medical records and previous exams onmedical practice									0.677				
4	36. Frequency of requesting medical records and previous exams in the last sixmonths									0.788				
4	20.5. Participation in community discussions about health issues in the last six months										0.352			
3	34. Percentage of referrals to a specialist in the last six months										0.779			
6	51. Classification of the importance of incorporating knowledge about community beliefs and customs in medical practice										0.746			
3	28. Average percentage of postpartum consultations in the last six months											0.410		
3	14. Percentage of time dedicated to procedures (other than medical consultations)											0.824		
3	21. Analysis of the card for children under five years old (vaccine and growthcurves)												0.445	
3	27. Frequency of prenatal care												0.724	
4	39. Frequency of counter-referral forms received in the last six months													0,785

* 1. First-contact care, 2. Longitudinality, 3. omprehensiveness, 4. Coordination, 5. Family and community orientation, 6. Cultural competence.

Source: Authors.

The lowest number of items in the QSPC-Q professionals was observed in the cultural competence attribute one item), whereas the coordination attribute presented 20 validated items. The former aspect must be further explored since the professional and adult versions of the PCA-Tool-Brazil were not translated and cross-culturally adapted; therefore, it does not presentan item referring to the cultural competence attribute. Moreover, the presence of 20 items in thecoordi-

nation attribute demonstrated the strengthening of the coordination of care in the questionnaire since this attribute expresses the involvement of activities and guarantees the offer of individualized and comprehensive care[1]. The great challenges of coordination include network fragmentation, low availability of specialists, lack of qualified professionals, communication between services, interoperability, and electronic medical history. In this sense, an instrument that assesses the coordination of care may establish conditions to measure primary care from the perspective of a network, which is essential to establish lines of care integrated into health attention networks.

The structure of primary care in the reorientation of the assistance model finds support in the QSPC-Q, an instrument for vigilance and monitoring that consolidates the coordination of care as an organizational attribute to overcome iniquities and guarantee the comprehensiveness between services, levels of assistance, and continuity of care. The QSPC-Q was reliable, balanced, easy to comprehend by the studied population, and used expressions consistent with attributes of the theoretical framework of Starfield[5] and Donabedian[16].

The internal consistency and reliability suggested a balanced questionnaire with interrelated items. The exploratory factor analysis indicated 45 items extracted in 13 factors with a total accumulated variance of 69.53% and eigenvalue > 1 (Kaiser criterion). Tabachinik and Fidell[29] observed that the Kaiser criterion was better applied when the number of items was between 20 and 50, such as in the QSPC-Q professionals. As the PCATool is available only in the extended version (111 items)[30], we developed a short version of the QSPC-Q professionals.

The factor analysis[23,29] represents the constructs[24] that describe the initial set of variables and maintain the representative characteristics of the original variables. In the short version, we maintained only those items related to the six attributes of the original version. The concordance between mean scores of attributes after conversion of the Likert to a nominal scale (i.e., range between 0 and 10)[27] was also used to assess the concordance between the extended and short versions.

This study is not free of limitations. First, the conceptual complexity of grouping theories to create a construct regarding primary care may not have been sufficiently contemplated since only one question related to first-contact care was included. Additionally, some questions or items from the initial version of the QSPC-Q could have been used to reinforce this attribute and strengthen the conceptual model. However, we focused on validating and assessing the internal consistency and reliability of the extended version.

Another relevant aspect is the ideal sample size for the exploratory factor analysis, which should comprise at least 5 to 10 participants per item or question[19,22]. However, the literature is contradictory, suggesting a minimal number of participants per item or minimal sample size[21]. In this sense, we applied at least 100 questionnaires, sufficient for the factor analysis[24,29]. Moreover, the results regarding communality also indicated that a sample between 100 and 200 was adequate[22]; an adequate number of individuals participated in the QSPC-Q professional.

We highlight that the QSPC-Q user must be applied with the QSPC-Q professional in BHU to prevent intention bias[30]. Further studies are needed to investigate the validity of the QSPC-Q and its impact on health quality and strengthening of primary care.

A strong correlation coefficient was found between the results of the short and extended versions ($r = 0.98$, $p < 0.001$) (Figure 1). The attributes of longitudinality and cultural competence were the most relevant in both versions. Moreover, family and community orientation presented a higher mean value in the short (5.36) than in the extended (5.18) version (Figure 2).

Conclusions

The QSPC-Q developed for professionals and users was valid and presented internal consistency even after adjusting items, thus attending to the psychometric criteria for the development and validation of instruments. Additionally, the short version is novel in the current Brazilian context.

We believe this questionnaire will facilitate the continuing assessment and strengthen primary care based on a qualified perception of users and professionals.
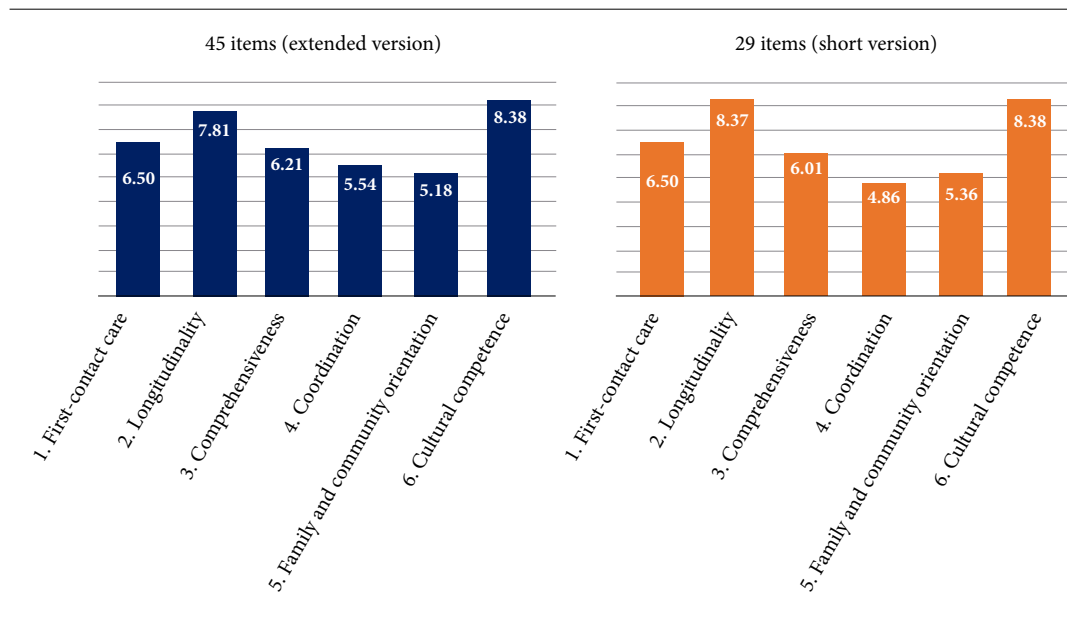
Figure 2. Mean scores of attributes from the perspective of professionals according to the extended and short versions of the questionnaire.

Source: Authors.

Collaborations

CTC Pazos: conception and data collection and analysis. APR Carvalho, CCA Silva, JR Silva Junior, and ACFC Abreu: data analysis, interpretation, and writing and review of the manuscript. Mozart Júlio Tabosa Sales, Paulo Sávio Angeiras de Goes, and Suely Arruda Vidal: conception, data collection and analysis, interpretation, and writing and review of the manuscript. All authors approved the final version and submission of the manuscript.

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