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Quality assessment of abortion care from the users' perspective: dimensional structure of the QualiAborto-Pt questionnaire

Avaliação da qualidade da atenção ao aborto na perspectiva das usuárias: estrutura dimensional do instrumento QualiAborto-Pt

Evaluación de la calidad de la atención al aborto desde la perspectiva de las usuárias: estructura dimensional del instrumento QualiAborto-Pt

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Abstract

Abortion complications are a major public health problem, and studies to assess the quality of abortion care require adequate measurement tools. This study is a continuation of such an instrument's refinement, the QualiAborto-Pt questionnaire. Using data from a survey of 2,336 women hospitalized for abortion complications in 19 hospitals in three state capitals in Northeast Brazil (Salvador – Bahia, Recife – Pernambuco, and São Luís – Maranhão), we implemented a series of exploratory and confirmatory factor analyses based on a 55-item prototype. The analyses indicate a structure with 17 items in five dimensions: reception, orientation, inputs/physical environment, technical quality, and continuity of care. All the items in the final model displayed acceptable reliability, absence of content redundancy, and factor specificity, as well as theoretical consistency with the respective dimensions. The solution also shows discriminant factor validity. Despite some persistent issues for further analysis and clarification, this version merits recommendation for use in Brazil.

Induced Abortion; Health Services Research; Surveys and Questionnaires; Reproducibility of Results; Women's Health

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Introduction

Every year there are approximately 22 million unsafe abortions in the world, 98% of which in low and middle-income countries [1]. According to the World Health Organization (WHO) [1], one-fourth of these abortions require timely medical care to avoid complications.

In Brazil, abortion is only allowed when the pregnancy results from rape or involves risk to the woman's life or fetal anencephaly. Yet the legal prohibition does not prevent abortion in practice [2]. According to a national survey in urban areas in 2016, 18% of Brazilian women 35 to 39 years of age reported having undergone an abortion [3]. Illegality contributes to unsafe abortions, and the resulting complications lead to more than 200.000 hospitalizations per year [2]. Women encounter problems in health services, ranging from difficulty in access to hospital beds to situations of discrimination during hospitalization [4]. Delays in care determine the severity of complications [5]. Still, there are few Brazilian studies on quality of post-abortion care [6,7].

The international literature features health facilities for care of obstetric emergencies, which includes abortion complications [8]. Studies on women's perceptions of such care are less common and have been conducted in jurisdictions where abortion is legal [9]. This gap motivated the GravSus-NE study on hospital abortion care in the Brazilian Unified National Health System (SUS) in three state capitals in Northeast Brazil: Salvador (Bahia State), Recife (Pernambuco State), and São Luís (Maranhão State) [10]. Quality of care was defined on the basis of the ethical and normative framework for women's comprehensive healthcare and abortion care in particular [11,12]. Four essential dimensions of care were considered: reception and orientation, technical quality of care, inputs/physical environment, and continuity of care [10].

Although a publication from 2013 [13] concluded in favor of the evaluability of the model of abortion care proposed by the Brazilian Ministry of Health [12], at the beginning of this study no instruments were identified to assess quality of care for unsafe abortion from the patients' perspective, except for a set of items in a WHO document [14]. Since these items partly covered the intended dimensions, they were used as the point of departure for developing an appropriate questionnaire for Brazil's characteristics and standards for abortion care [12] (hereinafter "QualiAborto-Pt").

A previous article [15] discussed the first stage in the development of this questionnaire, involving the formal process of translation and semantic refinement of the original set of WHO items. Questions from other studies were added, and still other questions were developed by our own team. This article continues the process, aimed at assessing the previous prototype's psychometric properties. In order to fine-tune the questionnaire and propose a more effective and efficient factor solution, the study visits the configural and metric structures of QualiAborto-Pt. We assess the dimensions originally proposed according to the theoretical frame of reference [10], reliability (discriminant validity), factor specificity, and absence of redundancy in the component items, as well as the set's discriminant factor validity (among the subscales).

Methods

Study design, sampling procedures, and data production

This cross-sectional study included women 18 years or older living in the municipalities included in the study, hospitalized for abortion or its complications, independently of the clinical severity and reported type (induced or spontaneous abortion). The sample excluded abortions permitted by Brazil's legislation, resulting from ectopic pregnancy and hydatidiform mole, and those resulting from other abnormal products of conception whose clinical and legal justifications support uterine evacuation under safe conditions.

The sample size was estimated at 2,562 women to compare prevalence of serious complications between the three cities. Based on the literature [16] and on the cities' secondary data, we assumed a 100% difference in the prevalence of serious complications in Salvador (p2 = 0.08) compared to Recife (p1 = 0.04). We interviewed the women hospitalized from August 31 to December 30, 2010, for abortion complications in all the public hospitals providing this type of care (seven in Salvador, eight in Recife, and four in São Luís) until we reached the calculated sample size.

Among the 3,071 eligible women, there were 5.9% of losses (due to hospital discharge or death before the interview) and 2.7% of refusals. The 2,804 interviewed women had a median age of 27 years, and 57% had a complete secondary education.

Face-to-face interviews were performed by female health professionals, protected by professional confidentiality, trained for 40 hours, and certified for this purpose. The interviews took place while patients were waiting for hospital discharge, although it was possible to perform the interviews partially before then. Questions on inputs/physical environment and continuity of care could only be answered after the patient had been informed of her discharge. Only 5.3% of the interviewees did not answer this section of post-discharge questions. The population actually analyzed include 2,336 patients.

Data analysis

The first stage included a series of meetings for the selection and refinement of the 55 items on the prototype questionnaire [15]. The central focus was to assess whether the items should be excluded or maintained, and whether they could be improved. Decisions were also based on preliminary exploratory factor analyses. The process led to a second prototype containing a reduced number of items (details discussed in the *Results* section).

In the second stage, dimensional scrutiny of this reduced prototype began with the investigation of the original four-dimensional structure: reception and orientation; technical quality of care; inputs/physical environment; and continuity of care [15]. Confirmatory Factor Analysis (CFA) was used for this purpose [17,18].

Anticipating problems in the original dimensionality, the prototype's configural structure was then submitted to exploratory reassessment. An interim principal components analysis was performed to obtain eigenvalues aimed at orienting the subsequent analyses [19]. These consisted of adjusting Exploratory Structural Equation Models (ESEM) with 2 to 6 factors [20]. The presence of residual item correlations (error) was also inspected, since violation of local (conditional) dependence may be indicative of item redundancies [17]. All the ESEM used the geomin oblique rotation method [18,21]. Evaluation of the configural structure followed the theoretical meaning.

Having identified the "best" ESEM, a Corresponding Confirmatory Factor Analysis (CFA) model was adjusted, freely estimating the item loadings pertaining to a given factor, but limiting the other factors to zero. In addition to reassessing the factor loading sizes and possible error correlations, this stage involved the evaluation of Fator-Based Discriminant Validity (FDV). This consisted of comparing the square root of the each factor's Average Variance Extracted (AVE) with the respective factor correlations ($\sqrt{\rho_{ve(f\bullet)}}$ *vs.* $\phi_{f\leftrightarrow\kappa}$) [17,22]. AVE relates the quantity of information in a characteristic captured by the (manifest) items to the amount of error in the measurement, that is, the portion not explained by the latent factor [23] Mathematically, it is a function of the standardized item loadings and the respective residuals [24]. Values vary from 0 to 1. A violation of FDV was defined as $\sqrt{\rho_{ve(f\bullet)}} < \phi_{f\leftrightarrow\kappa}$ in at least one of the factors, as long as statistically significant at 5%. This analysis used the bootstrap method (B = 1,000 replications) [24,25].

Completing the process, we explored the sustainability of the instrument's reduced versions, given that item anomalies could be revealed in the previously described CFA.

To increase the instrument's efficiency, the items were dichotomized according to presence or absence of quality indicators (e.g., respectful treatment, adequate waiting time, and information on the procedure, among others). All the stages thus used probit models on tetrachoric matrices and the Weighted Least Square Mean and Variance adjusted robust estimator (WLSMV) [26,27]. Three indices were used to assess the model fit [17]: Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI) [17,22,28,29,30]. RMSEA values below 0.60 suggest an admissible fit, while values above 0.10 indicate clear inadequacy and that the model should be rejected [21,31]. CFI and TLI vary from zero to one, and values above 0.95 indicate good fit [17,30]. Interim diagnoses of cross-loadings (CFA) and residual correlations (ESEM and CFA) aimed at Modification Indices (MI) and the respective Expected Parameter Changes (EPC) offered in the outputs of the Mplus 8.1 software (https://www.statmodel.com/), used in the main analyses. The descriptive analyses used the Stata 15 software (https://www.stata.com).

Ethical aspects

The ethical principles of respect for the person, beneficence, and justice were ensured and have been described in a previous article [10]. The research protocol for GravSus-NE was approved by each respective Institutional Review Board and the Brazilian National Commission on Research Ethics.

Results

First stage

Of the 55 initially proposed items [15], nine were excluded (D17 to D25), pertaining to the procedure's timing. This was because 96% of the women had undergone curettage and could not answer the questions because they were under anesthesia. Nine other items on the context of care were removed because they contributed little to optimizing the instrument's metric and scalar properties with items describing the type of procedure used in the uterine evacuation (A2); the type of professional performing the examination (A3, A4, A5, and P28) and/or furnishing information on contraceptives (P39); the type of persons present at the examination before or after the procedure (A12 and P31); or type of contraceptive prescribed (P42).

As the result of theoretical considerations (content), three derived indicators were established next, combining connected items: whether the woman received and understood information on health/physical condition (A7 and A8); whether there were persons present during the examination and whether this presence embarrassed the woman (A11 and A13); and whether the patient felt pain before the procedure, and if so, whether she was medicated (A14 and A15).

Some decisions were also made in light of the preliminary exploratory factor analyses of this set of items. Due to the high collinearity between three items pertaining to the post-procedure examination, two were excluded that qualified it – whether the treatment was respectful (P29) and whether privacy was ensured (P32), opting to maintain the examination itself (P28) as the marker of technical quality of care.

The item on supply of sanitary napkins (P47) moderately loaded the dimension on inputs/physical environment but showed an even greater connection with technical quality of care, consisting of items pertaining to pain management (P27) or blood pressure control (P50). Although the items might reflect a concern with the patient's wellbeing and serve as an indicator of prevention of infection by avoiding the accumulation of material favorable to the development of microorganisms, these cross-loadings appeared difficult to interpret, thus justifying their removal.

The item on the presence of an accompanying person during hospitalization (P48) was excluded, since it did not load any dimension in the preliminary analysis and for substantive reasons. Although the item is not included in Brazil's technical guidelines [12] since abortion is illegal and clandestine in Brazil, some women preferred to stay alone, thus preventing the item's use as an indicator of quality of care.

Two items on reproductive planning – prescription of contraceptives (P40) and orientation on where to obtain the prescribed method (P43) – proved to be highly colinear, leading to estimation problems. We opted to maintain P43 because it showed greater reliability (expressed as a higher factor loading) and for a theoretical reason, since the orientation on where to obtain the method (P43) indicates completeness of this act, as opposed to mere prescription (P40), and thus better quality of care.

During this stage, the items' dichotomization was backed by the results of the preliminary analyses, revealing maintenance of configural structure and even some improvement in the metric properties (e.g., increased reliability of the items). Details on the excluded items and respective alternative answers can be requested from the authors.

Second stage

At the end of the previous stage, there were 21 items that were then submitted to more detailed factor analyses. The initial four-factor proposal only fit moderately (Table 1). Although RMSEA revealed

Table 1

Confirmatory Factor Analysis (CFA) of the four-factor structure of the 21-item QualiAborto-Pt questionnaire.

	Item	Factor 1 $\lambda_{i(f1)}$	Factor 2 $\lambda_{i(f2)}$	Factor 3 $\lambda_{i(f3)}$	Factor 4 $\lambda_{i(f4)}$	δ_i
A1	Waiting time until first examination	0.325				0.894
D16	Waiting time until uterine evacuation procedure	0.282				0.917
A11_13	Privacy (embarrassment in presence of others)	0.268				0.924
P54	Discrimination perceived during care	0.386				0.848
A6	Respectful treatment at first examination	0.630				0.602
A7_8	Information on physical health	0.786				0.388
A9	Information on procedure	0.803				0.358
A10	Opportunity to ask questions	0.832				0.304
A14_15	Treatment of pain		0.283			0.922
P28	Post-procedure examination		0.697			0.511
P50	Blood pressure measured		0.882			0.223
P51	Temperature measured		0.834			0.302
P52	Assessment of bleeding		0.835			0.304
P44	Bedclothing changed			0.773		0.415
P45	Cleanly environment			0.634		0.601
P46	Supply of hospital clothing with right size			0.350		0.877
P33	Orientation on post-discharge care				0.755	0.439
P35	Follow-up appointment scheduled				0.552	0.713
P36	Information on reproductive planning				0.685	0.546
P43	Orientation on obtaining prescribed contraceptive method				0.783	0.466
P34	Orientation on risk of new pregnancy				0.873	0.264
RMSEA (90%CI)	0.043 (0.041; 0.046)					
CFI	0.937					
TLI	0.928					

λ_i: factor loadings; δ_i: residuals; CFI: Comparative Fit Index; 90%CI: 90% confidence interval; RMSEA: Root Mean Square Error of Approximation; TLI: Tucker-Lewis Index.

Note: in each item, the letters preceding the numbers refer to the timing of the care in relation to the uterine evacuation procedure (A = before, D = during, P = after; the letters correspond to these words in Portuguese).

admissible fit values, the CFI and TLI values were borderline (0.95 > x > 0.90). All the factor correlations were moderate to low, the highest being 0.576, between F2 and F4 (not shown in the Table). Nevertheless, four of eight item loadings postulated a priori as belonging to F1 proved to be low (A1, A16, A11_13, and P54) in this factor. The loadings were also low for item A14_15 in F2 and item P46 in F3. By contiguity, the respective residuals (δ_i) were high, all above 0.80. Many modification indices suggested poor specification of the original configural structure, and that the latter merited more detailed scrutiny.

In light of this initial result, we focused on new exploratory analyses (ESEM with 2 to 6 factors). Although the preliminary analysis of the eigenvalues indicated the possible existence of up to six factors (eigenvalues > 1.0), this sixth factor lacked interpretability in the 6-factor ESEM, including only one item with moderate expression and with a cross-loading in F4 – $\lambda_{35(f4)} = 0.412$ and $\lambda_{35(f6)} = 0.417$. At the other extreme, the 2- and 3-factor ESEM showed even more cross-loadings (data not shown).

Table 2 shows the results of the four- and five-factor ESEM. The fits improved substantially, with all three indices at acceptable levels. Factor correlations remained relatively low in both models, the largest involving F2-F4 again in the four-factor model ($\phi = 0.517$) and F3-F4 in the five-factor model ($\phi = 0.434$). Due to the free estimation of cross-loadings in ESEM, the residuals were low in both models. No residual correlation was detected.

Table 2

Exploratory Structural Equation Models (ESEM) for the four-factor structures (Model 2) and five-factor structures (Model 3) of the 21 item QualiAborto-Pt questionnaire.

Item	Model 2					Model 3					
	Factor 1 $\lambda_{i(f1)}$	Factor 2 $\lambda_{i(f2)}$	Factor 3 $\lambda_{i(f3)}$	Factor 4 $\lambda_{i(f4)}$	δ_i	Factor 1 $\lambda_{i(f1)}$	Factor 2 $\lambda_{i(f2)}$	Factor 3 $\lambda_{i(f3)}$	Factor 4 $\lambda_{i(f4)}$	Factor 5 $\lambda_{i(f5)}$	δ_i
A1	0.149	-0.109	0.511	0.040	0.687	0.695	-0.073	0.003	0.127	0.014	0.527
D16	0.238	-0.165	0.417	-0.009	0.736	0.675	0.028	-0.037	0.074	-0.105	0.548
A11_13	0.181	0.013	0.319	-0.089	0.439	0.348	0.091	0.043	-0.058	0.051	0.444
P54	0.176	-0.002	0.554	-0.069	0.847	0.446	0.109	-0.022	-0.053	0.257	0.836
A6	0.625	0.003	0.335	-0.138	0.631	0.339	0.571	0.003	-0.147	0.059	0.649
A7_8	0.642	0.161	0.034	0.089	0.451	0.022	0.666	0.140	0.032	0.020	0.444
A9	0.790	-0.006	-0.043	0.158	0.310	-0.035	0.845	-0.028	0.080	-0.030	0.284
A10	0.821	0.053	-0.018	0.084	0.266	0.029	0.835	0.050	0.021	-0.060	0.269
A14_15	0.108	0.272	0.083	-0.090	0.908	0.163	0.029	0.318	-0.058	-0.066	0.885
P28	0.080	0.605	0.105	0.033	0.548	0.033	0.072	0.582	0.031	0.102	0.549
P50	0.025	0.865	-0.030	0.028	0.223	-0.088	0.023	0.844	0.027	0.048	0.224
P51	-0.024	0.909	-0.064	-0.029	0.220	-0.071	-0.056	0.909	-0.013	-0.005	0.215
P52	0.111	0.764	0.049	0.013	0.339	0.054	0.065	0.776	0.026	0.008	0.328
P44	-0.208	0.264	0.509	0.152	0.590	0.012	-0.093	0.035	0.076	0.790	0.349
P45	-0.094	0.229	0.473	0.043	0.697	0.058	0.021	0.053	-0.025	0.580	0.622
P46	-0.017	0.101	0.338	0.000	0.869	0.182	-0.018	0.045	-0.006	0.265	0.872
P33	0.061	-0.076	0.049	0.788	0.395	-0.061	0.136	-0.084	0.723	0.186	0.376
P35	0.010	0.055	0.106	0.477	0.712	-0.079	0.099	-0.004	0.414	0.256	0.687
P36	-0.006	0.069	-0.099	0.676	0.504	-0.003	-0.028	0.155	0.652	-0.057	0.492
P43	0.011	0.112	0.068	0.714	0.403	0.062	-0.035	0.221	0.700	-0.085	0.370
P34	0.004	-0.005	0.080	0.858	0.240	0.070	0.011	0.051	0.812	0.108	0.238
RMSEA (90%CI)	0.038 (0.035; 0.041)					0.026 (0.023; 0.030)					
CFI	0.965					0.986					
TLI	0.945					0.974					

λ_i: factor loadings; δ_i: residuals; CFI: Comparative Fit Index; 90%CI: 90% confidence interval; RMSEA: Root Mean Square Error of Approximation; TLI: Tucker-Lewis Index.

Note: in each item, the letters preceding the numbers refer to the timing of the care in relation to the uterine evacuation procedure (A = before, D = during, P = after; the letters correspond to these words in Portuguese).

Table 2 clearly shows that four-factor Model 2 was unable to separate part of the manifests postulated in different dimensions, combining five items (A1, D16, A11_13, P54, and A6), purportedly related to the dimension reception and orientation, to three (P44, P45, and P46) connected to inputs/physical environment. On the contrary, there is an adequate separation in the five-factor model's configural structure, which proved to be the most parsimonious and promising. Clearly the originally conjectured 4-factor model (Table 1) does not materialize in the ESEM, and it is even different from Model 2, which also has 4 factors.

Table 3 shows the CFA for the five-factor solution suggested in Model 3, further encompassing a cross-loading in A6 manifested consistently in the ESEM. The fit was similar to that of the related exploratory model. Three items (A11_13, A14_15, and P46) continued with low loadings, and complementarily with very high residuals. Again, no residual correlation was detected.

Aimed at dealing with these problematic items, Table 4 presents two alternative reduced models. Considering the values presented in Model 4 in Table 3, Model 5 excluded the items A6 (cross-loadings) and A14_15 (residual > 0.90); in Model 6, the exclusion extends to items A11_13 and P46, both with residuals > 0.8. The fit improved slightly in both solutions. Mainly in Model 6, all the loadings

Table 3

Confirmatory Factor Analysis (CFA) of the five-factor structure of the 21 item QualiAborto-Pt questionnaire.

Item	Model 4					
	Factor 1 $\lambda_{i(f1)}$	Factor 2 $\lambda_{i(f2)}$	Factor 3 $\lambda_{i(f3)}$	Factor 4 $\lambda_{i(f4)}$	Factor 5 $\lambda_{i(f5)}$	δ_i
A1	0.638					0.592
D16	0.576					0.669
A11_13	0.441					0.806
P54	0.656					0.570
A6	0.426	0.408				0.527
A7_8		0.798				0.363
A9		0.813				0.340
A10		0.842				0.291
A14_15			0.280			0.921
P28			0.695			0.516
P50			0.883			0.220
P51			0.835			0.302
P52			0.834			0.304
P44				0.766		0.414
P45				0.633		0.600
P46				0.362		0.869
P33					0.756	0.428
P35					0.551	0.696
P36					0.686	0.529
P43					0.784	0.386
P34					0.871	0.242
RMSEA (90%CI)	0.030 (0.027; 0.033)					
CFI	0.970					
TLI	0.965					

λ_i: factor loadings; δ_i: residuals; CFI: Comparative Fit Index; 90%CI: 90% confidence interval; RMSEA: Root Mean Square Error of Approximation; TLI: Tucker-Lewis Index.

Note: in each item, the letters preceding the numbers refer to the timing of the care in relation to the uterine evacuation procedure (A = before, D = during, P = after; the letters correspond to these words in Portuguese).

exceeded $\lambda_i = 0.55$, presenting residuals below 0.7 (the majority below 0.4). In this solution, the fourth factor has only two items. The interim diagnosis based on the MI/EPC does not show any cross-loading or presence of residual correlations.

Table 5 shows the square roots of the EMVs and the factor correlations concerning the last two models shown in Table 4. The conjectured DFV in the exploratory analyses appears to be sustained in the two alternative 5-factor models. All the $\sqrt{\rho_{ve(f\bullet)}}$ proved to be consistently higher than their respective correlations $\phi_{f\leftrightarrow\kappa}$. Focusing on F5 in Model 5, for example, $\sqrt{\rho_{ve(f5)}}$ widely outstrips the four correlations involving this factor ($\phi_{1\leftrightarrow5} = 0{,}11$, $\phi_{2\leftrightarrow5} = 0{,}45$, $\phi_{3\leftrightarrow5} = \phi_{4\leftrightarrow5} = 0{,}35$). The same pattern extends to the other contrasts between the $\sqrt{\rho_{ve(f\bullet)}}$ and respective $\phi_{f\leftrightarrow\kappa}$, and all the differences were statistically significant ($p < 0.001$). Importantly, the FDV is exacerbated from Model 5 to Model 6, with $\sqrt{\rho_{ve(f4)}}$ increasing substantially from 0.61 to 0.71.

The final 17-item instrument and the respective options for answers are shown in an Annex.

Table 4

Confirmatory Factor Analysis (CFA) of the reduced five-factor structures of the QualiAborto-Pt questionnaire with 19 items (Model 5) and 17 items (Model 6).

Item	Model 5						Model 6					
	Factor 1 $\lambda_{i(f1)}$	Factor 2 $\lambda_{i(f2)}$	Factor 3 $\lambda_{i(f3)}$	Factor 4 $\lambda_{i(f4)}$	Factor 5 $\lambda_{i(f5)}$	δ_i	Factor 1 $\lambda_{i(f1)}$	Factor 2 $\lambda_{i(f2)}$	Factor 3 $\lambda_{i(f3)}$	Factor 4 $\lambda_{i(f4)}$	Factor 5 $\lambda_{i(f5)}$	δ_i
A1	0.680					0.538	0.707					0.500
D16	0.594					0.647	0.603					0.637
A11_13	0.450					0.798	-					-
P54	0.577					0.667	0.556					0.691
A7_8		0.795				0.368		0.793				0.371
A9		0.814				0.337		0.816				0.334
A10		0.833				0.307		0.833				0.307
P28			0.698			0.513			0.697			0.514
P50			0.886			0.215			0.886			0.215
P51			0.834			0.305			0.835			0.304
P52			0.832			0.307			0.832			0.308
P44				0.775		0.399				0.785		0.384
P45				0.628		0.606				0.636		0.595
P46				0.357		0.873				-		-
P33					0.756	0.429					0.756	0.428
P35					0.559	0.688					0.560	0.686
P36					0.688	0.527					0.689	0.525
P43					0.781	0.390					0.781	0.390
P34					0.870	0.244					0.868	0.247
RMSEA (90%CI)			0.030 (0.027; 0.033)						0.034 (0.030; 0.037)			
CFI			0.975						0.976			
TLI			0.970						0.970			

λ_i: factor loadings; δ_i: residuals; CFI: Comparative Fit Index; 90%CI: 90% confidence interval; RMSEA: Root Mean Square Error of Approximation; TLI: Tucker-Lewis Index.

Note: in each item, the letters preceding the numbers refer to the timing of the care in relation to the uterine evacuation procedure (A = before, D = during, P = after; the letters correspond to these words in Portuguese).

Discussion

Quality of abortion care in Brazil has received relatively little attention [6,7]. Our study intended to address this gap with a valid and efficient instrument in the Portuguese language for use in future studies.

The initially proposed four-dimensional conceptual model [15] fit moderately, suggesting a distinct structure from the original. The subsequent analyses converged to some robust solutions. Model 6 was the most auspicious from the configural and metric point of view. The items have acceptable reliability, with all 17 factor loadings above 0.55, and 12 above 0.70. The residuals are within admissible margins (< 0.7), mostly below 0.4. This factor solution is consistent with the contents of the manifest items and respective dimensions; it shows the items' factor specificity, expressed as the absence of apparent cross-loadings; it excludes item redundancy, manifested as the absence of striking residual correlations; and it displays FDV, as shown by the formal analysis contrasting the items' aggregate informativity (by factor) and respective factor correlations.

This set of manifest items appears to adequately map five dimensions: reception, orientation, technical quality of care, inputs/physical environment, and continuity of care. As in the initial proposal, the latter three continue to be sustained in the new proposal, but the dimension reception and

Table 5

Square roots of the average variance extracted of each factor and factor correlations concerning the reduced five-factor structures of the QualiAborto-Pt questionnaire with 19 items (Model 5) and 17 items (Model 6).

	Model 5					Model 6				
	Factor 1	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**
$\sqrt{\rho_{ve(f\bullet)}}$	0.58 (0.55; 0.62)	0.81 (0.79; 0.83)	0.81 (0.80; 0.83)	0.61 (0.58; 0.64)	0.74 (0.78; 0.76)	0.62 (0.59; 0.66)	0.81 (0.79; 0.83)	0.81 (0.80; 0.83)	0.71 (0.67; 0.75)	0.74 (0.72; 0.76)
$\phi_{1\leftrightarrow 2}$	0.29 (0.22; 0.35)					0.29 (0.22; 0.36)				
$\phi_{1\leftrightarrow 3}$	0.08 (0.01; 0.14)					0.07 (0.01; 0.13)				
$\phi_{1\leftrightarrow 4}$	0.24 (0.17; 0.31)					0.21 (0.13; 0.29)				
$\phi_{1\leftrightarrow 5}$	0.11 (0.05; 0.18)					0.13 (0.06; 0.20)				
$\phi_{2\leftrightarrow 3}$	0.44 (0.38; 0.50)					0.44 (0.38; 0.50)				
$\phi_{2\leftrightarrow 4}$	0.22 (0.16; 0.29)					0.22 (0.14; 0.29)				
$\phi_{2\leftrightarrow 5}$	0.45 (0.39; 0.52)					0.46 (0.40; 0.53)				
$\phi_{3\leftrightarrow 4}$	0.42 (0.36; 0.49)					0.44 (0.37; 0.50)				
$\phi_{3\leftrightarrow 5}$	0.59 (0.53; 0.65)					0.60 (0.54; 0.66)				
$\phi_{4\leftrightarrow 5}$	0.35 (0.28; 0.42)					0.37 (0.30; 0.45)				

$\sqrt{\rho_{ve(f\bullet)}}$: square root of the extracted mean variance. In parentheses, 95% confidence intervals.
$\phi_{f\leftrightarrow\kappa}$: factor correlations. In parentheses, 95% confidence intervals.

orientation partitions into two. The items postulated as manifestations of a purported cohesive set encompassing the sphere of contact at entry to the service form distinct dimensions, one involving reception and the other involving formation/orientation. Although both refer to health professionals' communication with patients, they proved to have distinct contents.

Reception is defined by the Brazilian Ministry of Health as "*decent and respectful treatment, listening, recognition, and acceptance of differences, respect for women's and men's right to decide, as well as access to care and case-resolution capacity*" [12] (p. 17). In the QualiAborto-Pt questionnaire, the dimension reception consisted of three items: waiting for the first examination; waiting for the uterine evacuation procedure; and perception of discrimination during care.

The item on "respectful treatment in the first examination" (A6) presented cross-loading and was excluded. This may have occurred due to the term's ambiguity in the Portuguese language. As intended in the original version in English, "respectful" can be the equivalent of courtesy and kindness; in Portuguese, the term also connotes decency (sometimes with a sexual content), which may have given rise to distinct interpretations of the item. Prior to the main psychometric analyses, an equivalent item (P29) pertaining to respectful treatment in the post-procedure examination had been eliminated due to the high degree of collinearity with privacy (P30_32) and the examination itself (P28). In the instrument's refinement, the latter was maintained, since it was more objective for assessing the dimension technical quality of care, discussed below. The item on privacy was maintained, conceived as preservation of intimacy in the body's exposure and manipulation [32,33]. The literature defines it as an expression of decent treatment and respectful care [34]. We thus recommend revisiting these items in the future.

Also prior to the main analyses, another item that presented problems and was removed concerned the presence of an accompanying person during part or all of the hospital stay (P48). Although not present in the Brazilian guidelines, its beneficial effect on childbirth care [35] and recently on abortion care [36] is acknowledged, emphasizing the pertinence of revisiting this indicator in future analyses. However, since abortion is illegal and clandestine in Brazilian, some women prefer to stay alone at the hospital, which relativizes the item's importance as an appropriate manifestation of quality of care.

The other items in this dimension displayed good psychometric properties. Two items measure the adequacy of waiting time until the first examination (A1) and until the procedure (A16), where the care's speed and timeliness are considered essential to the outcome in abortion complications [5].

Likewise, the item on perception of discrimination in care (P54), which aims to grasp respect for differences, showed good psychometric properties and remained in the final model. This item is especially relevant, since in the hierarchy of priorities of care, beyond technical criteria, other (subjective and moral) items intervene, lending primacy to childbirth rather than to abortion complications [37].

The partitioned dimension – orientation – assumes *"the transfer of necessary information for conducting the process of care with the woman as protagonist in the health act, decision-making, and selfcare in keeping with the SUS guidelines"* [12] (p. 17). This dimension was addressed properly and included, in the first place, an item that assesses the transfer of information on the woman's physical condition and whether she has understood the information (A7_8). Another item (A9) considers the transfer of information on what will happen during the procedure. Both concern explanations on health conditions, considered essential for ensuring the rights to information and autonomy [34]. The item on the opportunity to ask questions (A10) reflects the health team's capacity to hear and answer patients' questions prior to the procedure, considered a crucial component in quality of care and an indicator of two-way communication [38].

The items on technical quality of care showed good psychometric properties, and four out of five postulates remained in the final model. These address factual and objective information [39] such as performing low-density technologies and universally disseminated knowledge – measurement of body temperature (P50) and blood pressure (P51) or control of bleeding (P52). Appreciation of pain management was the only item with less-than-admissible performance, possibly due to the greater subjectivity in the capacity to withstand pain [39]. This aspect merits more in-depth examination in the future, given its importance for quality of care from the perspective of reproductive rights, the right to health, and physical integrity.

In the dimension inputs/physical environment, two criteria related to the environment that remained in the final instrument – cleanliness of the physical space and changes to bedclothing –, are traditionally included in questionnaires [34] assessing women's healthcare perceptions (e.g., the *World Health Survey* [40], from which they were extracted). These indicators aim to grasp aspects connected to the services' infrastructure and facilities, providing information on the available resources for provision of care.

Two other items proposed by the research team – supply of patient's hospital clothing with the correct size and sanitary napkins – were not confirmed as good manifestations and were eliminated for different reasons. The supply of sanitary napkins (P47) presented a cross-loading in another factor, starting in the preliminary analyses. Signaling heterogeneity in the patients' perceptions, some saw this item as related to technical quality of care while others as an input related to the quality of the physical environment where the care is provided. The other item (P46) concerning the supply of patient's clothing was eliminated in the principal stage of analysis with 21 items, due to its low reliability. It was related to the size of the clothing – aimed at measuring privacy and non-exposure of the body – and not to the supply per se or to the clothing's cleanliness [34]. Both items merit future scrutiny, since one cannot rule out the possibility of problems in drafting these questions, developed more from a descriptive perspective than to compose a scale. It would also be relevant to identify other items, such as quality of meals, airiness and silence in the environment, and comfort in the facilities [34], since this dimension (unlike the others) now has only two items, which is undesirable for good dimensional mapping [41].

The dimension continuity of care includes relational aspects in communication between healthcare providers and patients. The items on orientation for post-discharge care (P33), information on family planning (P36), orientation on where to obtain contraceptive methods (P43), and orientation on risk of a new pregnancy (P34) displayed good psychometric properties and remained in the model. When included in this dimension together with the item on scheduling the follow-up appointment (P35), they corroborate the literature on their pertinence to continuity of care beyond the moment assessed [34,42].

As a continuation of the work launched with the elaboration of a prototype to assess the quality of abortion care, the current evaluation of psychometric properties in the QualiAborto-Pt questionnaire was based on the concept's definition and its components, the cross-cultural adaptation of a set

of items proposed by the WHO, and the adaptation and formulation of other items that expressed the criteria defined in the conceptual model.

Items not included in the current analyses can be incorporated in the future and should be tested in new analyses. The type of method used in the uterine evacuation would be the first of these, since Brazilian and international guidelines recommend the use of manual or electric aspiration and medical (drug-induced) abortion [12,14]. Both involve less risk and greater patient safety than curettage, which is still widely used in Brazilian hospitals. Despite its pertinence, the item's inclusion depends on the women's knowledge of the methods in order for them to respond "reliably".

A second potential indicator relates to ultrasound performed in the hospital and the waiting time for performing this test. Ultrasound has become an essential tool for diagnosing the type of abortion and determination of the therapeutic approach. The lack of ultrasound on the hospital night shift and weekends leads to delays in care and longer length of hospital stay [43].

A third indicator to be examined in the future is sharing the same space with postpartum women and their newborn infants. Studies have shown that this embarrasses women undergoing abortion, especially during visiting hours, when they are asked where their babies are [44].

A contingency in the current study involves the exclusion of nine items on the uterine evacuation's timing, since 96% of the women underwent curettage and were unable to assess the care during the procedure because they were under anesthesia. Future studies can elucidate the properties of these items, related strictly to the type of uterine evacuation procedure.

Another question that requires greater exploration concern the items that were combined in the current study and assumed as single questions, but which were obtained on the basis of separate questions. Combining information in data's processing and analysis is not necessarily equivalent to unifying their contents. Future studies can clarify this question, because the semantic union allows decreasing the time spent applying the questionnaire and increasing its efficiency.

A potential limitation to the study is the fact that the models were tested, modified, and corroborated (some) in a single data set. Ideally, the findings' corroboration (or lack thereof) would be done in new studies with similar or even different domains, also aimed at assessing configural, metric, and scalar invariance [17].

In fact, the unexplored scalar structure is another drawbasck to mention, but this stems less from a flaw in the article itself than from the instrument's own ongoing development process. Beyond good evidence on configural and metric structure, it is necessary to affirm an instrument's mapping capacity in order to endorse it definitively [41,45]. Future studies might assess the component items' scalability and the scales formed by them [41,46].

The questionnaire's application during the patient's hospital stay was intended to avoid difficulties in obtaining interviews in surveys on abortion, aggravated by the procedure's illegality in Brazil [47]. Strategies to hide the practice include omission or denial of abortion in household interviews, even when there are prior records of hospitalization for this cause, as well as reporting of imprecise contact information by the patient during hospitalization [48]. Follow-up studies outside the hospital context have reported losses of up to 60% [47,49,50].

The production of quality-of-care indicators based on the woman's report at the time of hospital discharge reduces the potential selection bias but requires considering the so-called "gratitude bias" [34]. The latter is heavily dependent on recall conditions, especially when a complex procedure with major emotional burden has just been performed. Future studies should consider other strategies to assess the degree to which the current psychometric results are actually influenced by this problem.

In short, the results indicate that the current 17-item version of QualiAborto-Pt can already be recommended for use in Brazil to assess the quality of care for unsafe abortion, despite persistent questions for further study. With adjustments and adaptations, its use can be extended to other sociocultural contexts, including other Portuguese-speaking countries and those with restrictive abortion laws. Its use should be encouraged, not only for substantive purposes in evaluative studies on care for unsafe abortion, but to generate backing for future studies on its internal structure and external validity [51]. The refinement of high-quality instruments such as the QualiAborto-Pt questionnaire can contribute to the comparability of studies and thus to better quality of care.

Contributors

E. M. L. Aquino contributed to the study's coordination, conception, and development, elaboration of the prototype, interpretation of the results, and writing and approval of the article. M. Reichenheim contributed to the conception of the analytical plan, data analysis and interpretation, and writing and approval of the article. G. M. S. Menezes, T. V. B. Araújo, M. T. S. S. B. Alves and S. V. Alves contributed to the study's conception and development, elaboration of the prototype, interpretation of the results, and writing and approval of the article. M-da-C. C. Almeida contributed to the data analysis, interpretation of the results, and writing and approval of the article.

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Resumo

As complicações do aborto são um importante problema de saúde pública e pesquisas para avaliar a qualidade da atenção requerem ferramentas de aferição adequadas. Este estudo dá sequência ao processo de refinamento de um instrumento para esse fim – QualiAborto-Pt. Utilizando-se dados de um inquérito com 2.336 mulheres internadas por complicações do aborto em 19 hospitais de três capitais do Nordeste brasileiro (Salvador – Bahia, Recife – Pernambuco e São Luís – Maranhão), implementou-se uma sequência de análises fatoriais exploratórias e confirmatórias com base em um protótipo de 55 itens. As análises apontam para uma estrutura de 17 itens em cinco dimensões: acolhimento, orientação, insumos/ambiente físico, qualidade técnica e continuidade do cuidado. Todos os itens do modelo final evidenciam confiabilidade aceitável, ausência de redundância de conteúdo, especificidade fatorial, e guardam coerência teórica com as respectivas dimensões. A solução também mostra validade fatorial discriminante. Ainda que persistam algumas questões a aprofundar e acertar, esta versão merece ser recomendada para uso no Brasil.

Aborto Induzido; Pesquisa sobre Serviços de Saúde; Inquéritos e Questionários; Reprodutibilidade dos Testes; Saúde da Mulher

Resumen

Las complicaciones del aborto son un importante problema de salud pública y las investigaciones para evaluar la calidad de la atención requieren herramientas de medición adecuadas. Este estudio da continuación al proceso de perfeccionamiento de un instrumento para este fin – QualiAborto-Pt. Se utilizaron datos de una encuesta con 2.336 mujeres internadas por complicaciones con el aborto en 19 hospitales de tres capitales del nordeste brasileño (Salvador – Bahia, Recife – Pernambuco e São Luís – Maranhão), se implementó una secuencia de análisis factoriales exploratorios y confirmatorios, a partir de un prototipo de 55 ítems. Los análisis apuntan una estructura de 17 ítems en cinco dimensiones: acogida, orientación, insumos/ambiente físico, calidad técnica y continuidad del cuidado. Todos los ítems del modelo final evidencian confiabilidad aceptable, ausencia de redundancia de contenido, especificidad factorial, y guardan coherencia teórica con sus respectivas dimensiones. La solución también muestra validez factorial discriminante. A pesar de que persistan algunas cuestiones por profundizar y acertar, esta versión merece ser recomendada para su uso en Brasil.

Aborto Inducido; Investigacuión sobre Servicios de Salud; Encuestas y Cuestionarios; Reproducibilidad de los Resultados; Salud de la Mujer

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