

Original Research

Cross-cultural adaptation and validation to Brazil of the scale of attitudes toward physician-pharmacists collaboration

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Abstract

Background: Despite the increasing complexity of medication therapies and the expansion of pharmaceutical clinical services to optimize patient care working in collaboration with physicians. In this sense, interdisciplinary education has been encouraged. However, no instrument is available to measure attitudes toward collaborative relationships.

Objective: To translate, cross-cultural adaptation and validation an instrument to measure collaboration attitudes toward students of medicine/pharmacy and physicians/pharmacists.

Methods: The process of cross-cultural adaptation was carried out using international recommendations and was performed from January 2014 to April 2015. The instrument under consideration was translated and re-translated. A panel of experts compared the generated documents and the translation was evaluated for 20 undergraduate students of Pharmacy, 20 undergraduate students of Medicine and professionals (20 pharmacists and 20 physicians).

Results: The process of cross-cultural translation and validation result in the Portuguese version. Modifications to the grammatical structures were made in order to establish a cross-cultural similarity between the English and Portuguese versions. Regarding the evaluation of the expert panel, six questions required modifications.

Conclusions: Psychometric evaluation demonstrated and confirmed the validity of the Brazilian-Portuguese version to assess collaborative attitudes among pharmacists and physicians. Moreover, the scale can be used to evaluate undergraduates and postgraduates and foster the development of teaching methods that promote comprehensive attitudes in patient care.

Keywords

Interprofessional Relations; Cooperative Behavior; Attitude of Health Personnel; Pharmacists; Physicians; Validation Studies as Topic; Surveys and Questionnaires; Brazil

INTRODUCTION

Collaboration among primary health care providers has been identified as a practice for the prevention of drug-related mortality and may result in the improvement of health outcomes for patients.¹⁻³ Professional collaboration was described in terms of a 'joint communication and decision-making process with the goal of meeting the patient's wellness and illness needs as best as possible, while respecting the unique qualities and abilities of both professionals'.⁴ Therefore, the increasing complexity of drug therapies and expansion of pharmaceutical clinical

services emphasize the need for strong working relationships between pharmacists and physicians to optimize patient care.⁵

Several studies highlight the need for collaborative practice between different health care professionals, including physicians and pharmacists.^{2,6-9} A study by Carter *et al.*¹⁰ affirmed that results obtained are thrice as good when pharmacists and physicians work together rather than separately.

In this sense, interdisciplinary education along with inter-professional collaboration between pharmacists and physicians has been encouraged in medical and pharmacy schools. This collaboration has the potential to optimize patient care and improve therapeutic outcomes, and is designed to enhance the skills that physicians and pharmacists will need to function in inter-professional health care teams.^{11,12} To afford evidence of the impact of inter-professional education within healthcare disciplines, there have been efforts to produce, validate, and use measurement scales.¹³

There are numerous scales that measure collaborative work, including the scale based on the Collaborative Working Relationship model¹⁴, the Physician/Pharmacist Collaboration Instrument¹⁵, and the Scale of Attitudes Toward Pharmacist-Physician Collaboration.^{16,17} Although all these scales are good instruments to evaluate inter-

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professional collaboration, the former two were developed specifically for professionals.

The Scale of Attitudes Toward Physician-Pharmacist Collaboration has the potential to be used in the evaluation of interdisciplinary educational programs where students from both professions learn from one another by working collaboratively in patient care. In addition, this scale can be used to compare the differences between groups in collaborative medical-pharmaceutical attitudes, and to research the clinical outcomes of collaborative work among professionals.^{16,17} However, applying the questionnaire in another country, culture, and language requires a unique methodology such that the original questionnaire corresponds adequately with its versions in target languages. Thus, cross-cultural adaptation requires not only a good linguistic translation, but also an adaptation that maintains content validity of the instrument across different cultures.¹¹ Thus, the aim of this study was to translate and cross-culturally adapt an instrument intended to measure collaboration attitudes toward students of medicine/pharmacy and physicians/pharmacists.

METHODS

Study design

A cross-sectional descriptive study was conducted from January 2014 to April 2015 in the Northeast region of Brazil, for a cross-cultural adaptation of the Scale of Attitudes Toward Physician-Pharmacist Collaboration to Brazilian Portuguese and its validation proposed by Hojat *et al.*¹² The Portuguese version was entitled 'Escala de atitudes colaborativas entre Médicos e Farmacêuticos'.

Sample size

The sample comprised pharmacy and medical students from the first and the last year of two courses at the Federal University of Sergipe, as well as pharmacy and medical professionals. The students belonged to the two campuses of the University of Sergipe and the professionals worked at the University Hospital of Sergipe. Two forms were used to apply this instrument: presently and on-line. For studies with such characteristics, Shoukri *et al.*¹⁸ consider a sample size of 20 for each group to be satisfactory.

Data collection

Pharmacy and medical students from the first and last year enrolled in the Federal University of Sergipe, located in two cities, São Cristóvão and Lagarto, were invited to complete the SATP2C.

The scale has 16 Likert-type items on a 4-point scale (1 =strongly disagree; 2 =disagree; 3 =agree; 4 =strongly agree). All the items are directly scored with the exception of the 9th item, which is reverse scored (1 =strongly agree; 2 =agree; 3 =disagree; 4 =strongly disagree). The respondent can score between 16 and 64. A high score indicates a more positive attitude about the relationship between physicians and pharmacists. All participants were informed about the study and could withdraw at any time. In the online application, the students were asked to answer the same scale in an on-line version. Besides

completing the questionnaires, students also provided data about their gender, age, higher education institution, course, and year of the course.

Ethics approval

This study was approved by the Research Ethics Committee of the University Hospital, Federal University of Sergipe (Brazil) under the registration code 'CAAE 11735412.50000.5546'.

Cross-cultural adaptation

The process of cross-cultural adaptation was conducted using international recommendations.^{12,19-24}

Translation

In the first stage, the instrument was translated independently by two investigators, a pharmacist (TCM) and a physician (SG), who were both native speakers of Portuguese and were proficient in English. They knew the objectives and concepts of the study. The two translations were compared and ambiguities or discrepancies in the translated words were addressed, generating a consensually translated version (Version 1).²⁵

Back translation

In the back translation process, Version 1 was translated again into English by two native translators, who were also pharmacists and fluent in Portuguese (Version 2). However, they were not familiar with the aims and concepts underlying the instrument.^{19,26}

Revision of translations

Researchers met and discussed all differences and discrepancies arising from the questionnaire translation and back translation processes and obtained a Portuguese version by consensus.

Comparison of translation and back translation by an expert panel

These panels were composed of specialists in the area of collaboration, who had proficiency in English and sufficient knowledge in analysing the items. Given that Brazil is a country with a vast territory with an area of 8,514,876 km², and is culturally diverse, there was a need to invite experts representing the five Brazilian regions (Central-West, Northeast, North, South and Southeast).

Expert panel 'A' evaluated the semantic and idiomatic equivalence comparing the original scale with the translated and back-translated version.

Semantic Equivalence: Do the words mean the same? Are there multiple meanings to a given item? Are there grammatical difficulties in the translation?

Idiomatic Equivalence: Colloquialisms, or idioms, are difficult to translate. The committee may have to formulate an equivalent expression in the target version.

Subsequently, expert panel 'B' evaluated cultural and conceptual equivalence by comparing the original scale with the translated version.^{21,25,27}

Cultural Equivalence: Items seek to capture the experience of daily life; however, often in a different country or

Table 1. Sample characteristics, Aracaju, Brazil, 2015.

Characteristics	Pharmacy students n= 20	Medicine students n= 20	Pharmacists n= 20	Physicians n= 20
Gender				
Female	15	7	11	8
Male	5	13	9	12
Mean age	24.35	24.47	26.85	31.70
Year				
2 ^o	1	0	-	-
3 ^o	10	17	-	-
4 ^o	4	2	-	-
5 ^o	4	0	-	-
6 ^o	-	1	-	-

culture, a given task may simply not be experienced (even if it is translatable). The questionnaire item would have to be replaced by a similar item that is actually experienced in the target culture.^{21,25,27}

Conceptual Equivalence: Often words convey a different conceptual meaning across cultures. The items that obtained less than 67% of agreement were resubmitted to the panels of experts and the observed discrepancies were resolved by consensus for their searches of project.^{25,27}

Pre-test

After revision by the expert panels, a pre-test was conducted, which consisted of administering the translated version of the instrument (Version 3) to a suitable sample of 20 pharmacy undergraduate students attending a public Brazilian university, in Aracaju, SE, 20 medical undergraduate students attending a public Brazilian university, 20 pharmacists, and 20 physicians. The sample size of the pre-test was based on the literature^{21,23} which suggests administering the instrument to a group of 30 to 40 individuals from the target population. In this step, students and professionals indicate the questions that generated doubts and difficulties in understanding. The pre-test ensured the correction of possible inconsistencies in meanings, as well as allowed the detection of errors, and confirmed whether the questions were understandable. The quality of the translation as well as the practical aspects of its realization were both considered.^{21,27} The analyses of descriptive statistics were performed using SPSS software, version 12.

Validation

After the pre-test, modifications were made where necessary and the obtained version was then submitted for content validation. In this phase, the version of the instrument was compared with another scale that analyses collaboration attitudes toward health professionals. Correlational methods were used to examine the construct validity of the SATP2C, criterion-related validity (Pearson correlation coefficient between scores of the two aforementioned scales), and internal consistency reliability (Cronbach's coefficient alpha), as well t-tests (for gender comparison).^{8,10,13} Retest reliability was measured to determine scale stability.

Statistical analysis

Data analysis was performed using SPSS software, version 12. Statistical analyses involved descriptive statistics, the non-parametric Kolmogorov–Smirnov test to check for normality, Spearman's test for correlation among variables

such as age and year of the course, and specialized ground and t-tests for the genders.

RESULTS

A Brazilian-Portuguese version entitled 'Escala de atitudes colaborativas entre Médicos e Farmacêuticos' (online appendix) was obtained from the translation and cross-cultural adaptation of the original scale. The translated and adapted version consists of 16 questions, which measures the level of collaboration between pharmacists and physicians, and the complete form is available in the Appendix.

In the translation and back-translation processes, grammatical changes were made to only some items to establish equivalence between words and languages.

The percentage of agreement for each question was calculated among the experts based on the answers obtained. In this study, 6.25% of the questions, only one questions, showed less than 67% agreement among the evaluators for semantic and idiomatic equivalences (committee 'A'). Committee 'B' reached an agreement of 50% half of questions. The remaining questions reached a percentage equal to or higher than 80% in both equivalences. It is worth emphasizing that all of the modifications proposed by the panel of experts were accepted. Less than 67% of the changes to the items were resubmitted and the observed discrepancies were resolved.

All changes proposed by the expert panel were analysed, but not all of them were adopted unless necessary. The analysis of cultural and conceptual equivalences by committee 'B' did not result in many modifications.

The pre-test was then conducted with a sample of students and professionals. Sample details are shown in Table 1. Most of the pharmacists worked in community and hospital pharmacies. The specialties that physicians worked in were infectious diseases and general practice.

The sample's evaluation of the content of items and the instrument was adequate, and the terms and expressions were found to be clear. A majority of the participants felt that the questionnaire was easy to understand and complete. They also evaluated the content as good and expressed only a few minor criticisms. The mean concordance regarding the understanding of the issue was 93.5% and 94.8% for the items. Item 5 had the least concordance (Table 2). Following these comments, and further testing in the original language, minor modifications were made to improve the fifth question, which previously was 'Pharmacists should be accountable to patients for the drugs they provide', and was modified to 'Pharmacists

Table 2. Results of the pre-test analysis (n=80). Aracaju, Brazil, 2015.

Question	Agreement (%)	Agreement (%)
A physician should be viewed as a collaborator and colleague with a pharmacist rather than his/her superior	76 (95.0%)	76 (95.0%)
Pharmacists are qualified to assess and respond to patients' drug treatment needs	72 (90.0%)	73 (91.3%)
During their education, pharmacy and medical students should be involved in teamwork in order to understand their respective roles	76 (95.0%)	76 (95.0%)
Pharmacists can contribute to decisions regarding drug interaction that can affect the patients	77 (96.3%)	77 (96.3%)
Pharmacists should be accountable to patients for the drug they provide	63 (78.8%)	73 (91.3%)
There are many overlapping areas of responsibility between pharmacists and physicians in drug treatment of the patients	71 (88.8%)	73 (91.3%)
Pharmacist have special expertise in counseling patients on drug treatment	75 (93.8%)	75 (93.8%)
Both pharmacists and physicians should contribute to decisions regarding the type and dosage of medicine given to the patients	76 (95.0%)	75 (93.8%)
The primary function of the pharmacist is to fill the physician's prescription without question	79 (98.8%)	78 (97.5%)
Pharmacists should be involved in making drug policy decisions concerning the hospital/pharmacy services upon which their work depends	77 (96.3%)	78 (97.5%)
Pharmacists as well as physicians should have responsibility for monitoring the effects of drugs on the patients	77 (96.3%)	78 (97.5%)
Pharmacists should clarify a physician's order when they feel that it might have detrimental effects on the patient	74 (92.5%)	74 (92.5%)
Physicians and pharmacists should be educated to establish collaborative relationships	75 (93.8%)	76 (95.0%)
Physicians should consult pharmacists for helping patients with adverse reaction or refractory to drug treatment	75 (93.8%)	77 (96.3%)
Physicians should be made aware that pharmacists can help in providing the right drug treatment	77 (96.3%)	77 (96.3%)
Interprofessional relationships between physicians and pharmacists should be included in their professional education programs	77 (96.3%)	78 (97.5%)

should assume liability for the drugs they provide patients'. Similarly, the twelfth question 'Pharmacists should clarify a physician's order when they feel that it might have detrimental effects on the patient' was modified to 'Pharmacists should verify a medical prescription when they feel that this can have detrimental effects on the patient'.

Descriptive statistics

Completed questionnaires were returned by 80 medicals students, pharmacy students, medical professionals, and pharmacy professionals. Descriptive statistics and reliability coefficients for the scale are reported in Table 3. The mean scores for pharmacy students/professionals and medical students/professionals were 56.1/3.8 and 54.58/4.7, respectively. The mean scale score of pharmacy students was significantly higher than the mean score of medical students ($p < 0.01$). All corrected item-total score correlations for each group were positive and significant ($p < 0.01$).

Reliability coefficients

The internal consistency reliability of the scale was calculated by Cronbach's alphas, which were 0.76 and 0.75.

This is acceptable for psychological testing, indicating that the scale is internally consistent.

Test-retest reliability

The test-retest reliability of the scale indicated moderately positive reliability and stability with a Spearman's rank correlation coefficient of 0.647. This result can be explained by the fact that formal clinical curriculum and patient care activities that require teamwork and inter-professional collaboration start in the ninth semester and the sample was heterogeneous, with students mainly from the third, fourth, and fifth years.

Gender comparison

Of all the participants who completed the survey, 50 women and 30 men specified their gender. No statistically significant difference was observed between men (M 54.26, SD 4.02) and women (M 55.68, SD 4.11) on their scale scores, $t(46) = 1.18$, $p = 0.24$.

Validity coefficients

The mean and standard deviation of the Jefferson Scale Related to Interprofessional Attitude Collaboration²⁸ for the sample of this study were 47.1 and 6.6, respectively.

Table 3. Descriptive statistics for the Scale of Attitudes Toward Physician-Pharmacist Collaboration (n=80). Aracaju, Brazil, 2015

	Pharmacy Students / Professionals (n = 40)	Medical Students / Professionals (n = 40)
Mean	56.1	54.58
Standard Deviation	3.8	4.7
25th Percentile	54	49
50th Percentile (Median)	56	56
75th Percentile	58	59
Range of scores	12	12
Reliability coefficient ^a	0.76	0.75
Validity Coefficient ^b	0.86	0.78

^aCronbach's coefficient alpha.
^bCorrelation with scores of the Jefferson Scale Related to Interprofessional Attitude Collaboration.

Cronbach's coefficient alpha for this scale was 0.86 in this sample. The scores of the SATP2C and the Jefferson Scale of Attitudes Toward Interprofessional Collaboration were correlated ($r = 0.70$, $p = 0.50$), which provides support for criterion-related validity of the SATP2C. Criterion validity is the degree to which scores of an instrument are correlated with those of another conceptually relevant and validated instrument.²⁹

DISCUSSION

In Brazil, literature shows that the training of healthcare professionals consists of specialized knowledge unrelated to critical debate on structuring care systems, is distant from collectively shared knowledge, focuses on disciplinary immobilization that provides dense knowledge, and is limited.^{30,31}

Although some institutions have invested in innovative curriculum frameworks and integrated programs that encompass various courses in the field of healthcare (such as medicine and pharmacy), no studies and instruments validated in the country were found that assess the predisposition and collaborative intent of these students to work in teams.³⁰ Hence, it was not possible to compare this instrument with others. Moreover, grammatical and vocabulary-related aspects were evaluated, and pronouns and verb tenses were standardized to resolve discrepancies in the meaning and content between versions. The lack of similar studies emphasizes the importance of the cross-cultural adaptation of this instrument.

In addition, few grammar adjustments were required through the inclusion of terms and phrases appropriate to the reality of the five Brazilian regions.²⁰ Therefore, the objective of the pre-test was to identify whether the questions were appropriate, and whether the wording of the items was understandable and pertinent to the categorization of answers; in other words, to ensure that the adapted version preserved equivalence with the original version and to detect errors and judge the former's appropriateness and comprehensiveness.²⁷ According to Alexander and Guirardello³¹, this process evaluated not only the quality of the translation but also the practicalities of its implementation. Gasparino and Guirardello showed that changes made at this stage helped to improve the clarity and ease of understanding of the instrument items²³; the modifications throughout the instrument were to that effect.

As the changes made were relatively minor and no questions were deleted, it was decided during an

investigators' meeting that repeating the entire translation and cross-cultural adaptation process was not necessary.

This study demonstrated the validity and reliability of the SATP2C in determining the attitudes of medical/pharmacy students and professionals. The magnitudes of reliability coefficients were all within the acceptable range for psychological tests, thereby supporting the internal consistency and reliability of the instrument.^{12,31}

Our finding that medical students scored lower on their attitudes toward collaborative relationship than pharmacy students has implications for interdisciplinary education and inter-professional collaboration. Because of the importance of teamwork and collaboration among health professionals for a patient's safety²⁴, targeted educational remedies are needed for the development of more positive and mutually respectful attitudes in these areas among health care professionals.

Thus, this article has the potential to be widely used with regard to collaboration between professionals in interdisciplinary education between courses and clinical outcomes from these collaborations.

Limitations

A limitation of this study is the sample size, despite what the literature recommends. The samples in other studies on the same theme and objectives have been more representative.

CONCLUSIONS

Psychometric evaluation demonstrated and confirmed the validity of the Brazilian-Portuguese version to assess collaborative attitudes among pharmacists and physicians. Therefore, this scale has the potential to be used in the implementation of teamwork and to measure changes in collaborative inter-professional behaviours. Moreover, the scale can be used to evaluate undergraduates and postgraduates and foster the development of teaching methods that promote comprehensive attitudes in patient care.

CONFLICT OF INTEREST

Authors report no conflict of interest.

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