Cross-cultural adaptation methods of instruments in the nursing area

Métodos de adaptação transcultural de instrumentos na área da enfermagem

Métodos de adaptación transcultural de instrumentos en el campo de la enfermería

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ABSTRACT

Objective: To analyze scientific publications in order to identify the cross-cultural adaptation methods of instruments that are mainly applied in nursing.

Method: Integrative review, in the electronic sources Medline – Pubmed, Cinahl, Lilacs, Scopus and Web of Science. 96 peer-reviewed papers, published between 2010 and 2015 were selected.

Results: The articles that composed the sample were published in 59 different journals, 15.2% were Brazilian. The largest number of publications was concentrated in 2015 (31.2%), 28 countries appeared on the list which is led by Brazil (33.3%), followed by China (10.4%). It was used 26 different guidelines, however the one proposed by Beaton and their collaborators was mentioned in 47 (49.0%) articles and the Brislin's in 12 (12.5%).

Conclusion: This review does not allow us to define the most appropriate method, however all methods applied agreed on the use of back translation. In addition, many studies in different languages and countries showed the international acceptability of the method developed by Beaton et al.

Keywords: Nursing. Cross-cultural comparison. Methodology. Validation studies.

RESUMO

Objetivo: Identificar os métodos de adaptação transcultural de instrumentos mais utilizados na área da enfermagem.

Métodos: Revisão integrativa, em fontes eletrônicas Medline via Pubmed, Cinahl, Lilacs, Scopus e Web of Science. Foram selecionados 96 artigos revisados por pares e publicados entre 2010 e 2015.

Resultados: Os artigos que compuseram a amostra foram publicados em 59 periódicos diferentes, sendo 15,2% destes brasileiros. O maior número de publicações concentrou-se em 2015 (31,2%). Além disso, 28 países apareceram na lista liderada pelo Brasil (33,3%), seguido de China (10,4%). Utilizaram-se 27 modelos de adaptação transcultural diferentes. Entretanto, o proposto por Beaton e colaboradores foi citado em 47(49,0%) artigos, e o de Brislin em 12 (12,5%).

Conclusões: Não há consenso sobre adaptação transcultural; entretanto, todos os métodos coincidiram na utilização da etapa de retrotradução. Além disso, diversos estudos em diferentes idiomas e países apontaram a aceitabilidade internacional do método desenvolvido por Beaton e colaboradores.

Palavras-chave: Enfermagem. Comparação transcultural. Metodologia. Estudos de validação.

RESUMEN:

Objetivo: Analizar las publicaciones científicas para identificar los métodos de adaptación transcultural de los instrumentos más aplicados en el campo de la enfermería.

Método: Revisión integradora en las fuentes electrónicas: Medline via Pubmed, Cinahl, Lilacs, Scopus y Web of Science. Se seleccionaron 96 estudios revisados por pares, publicados entre 2010 y 2015.

Resultados: Los artículos que compusieron la muestra provenían de 59 periódicos diferentes, 15.2% eran brasileños. El mayor número de publicaciones se centró en 2015 (31.2%), 28 países aparecieron en la lista que está encabezada por Brasil (33,3%), seguido por China (10,4%). Se utilizaron 26 guidelines diferentes; sin embargo, lo propuesto por Beaton y sus colaboradores se ha citado en 49,0% y el de Brislin en 12,5%.

Conclusión: Esta revisión no permite definir un consenso del método más adecuado. Sin embargo, todos los métodos utilizados coinciden en el uso de back translation. Además, diversos estudios en distintos idiomas y países señalaron la aceptación internacional del método de Beaton et al.

Palabras clave: Enfermería. Comparación transcultural. Metodología. Estudios de validación.

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INTRODUCTION

The adaptation of research instruments and/or measurement scales in the Nursing area has gained space within the scope of current scientific research, as a tool for the development of practice and science in the area[1].

This translation and adaptation from one language to another requires methodological rigor, meaning that the researchers must act in uniformity, with impersonality and obedience to the methodological segment that they propose to use, being faithful to the step-by-step translation and cross-cultural adaptation, so that the values reflected by an instrument and the meanings of its components remain equivalent from one culture and another. However, the translation process is often a late reflection, treated as an unimportant part of the study protocol and implemented without close attention to the issues involved[2].

A substantial amount of studies and publications has been developed, involving translation and adaptation of instruments to different languages and cultures. From this, it is relevant to research on the methodologies of this process, as well as on the quality of the studies. Considering these aspects, the objective of this work is to identify the methodological models of cross-cultural adaptation of research instruments used in the nursing area.

METHOD

This integrative review has carefully fulfilled the six steps proposed by Whittemore and Knafl: 1) selection of the guiding question; 2) definition of the characteristics of the primary surveys of the sample; 3) selection, in pairs, of the surveys that made up the review sample; 4) analysis of the findings of the articles included in the review; 5) interpretation of the results; and 6) report of the review, providing a critical examination of the findings[3-4].

The study question was: what are the methodological models of cross-cultural adaptation of the research instruments used in nursing? For the search and selection of the articles, the following databases were consulted: Latin American Literature in Health Sciences (Lilacs) via Virtual Health Library (BVS), Cumulative Index to Nursing and Allied Health Literature (Cinahl), Medline via Pubmed, Scopus and Web of Science via Capes Journals Portal. The research problem was synthesized in the document indexing language from the controlled descriptors found in Cinahl Titles, in MeSH (Medical Subject Headings) eand in DeCS (Health Sciences Descriptors): Questionnaires, Scale, Validation Studies, Nursing Methodology Research, Nursing. Non-controlled descriptors were also used: Instrument, Cross-cultural adaptation.

The terms were combined using the Boolean operators "OR" and "AND". After identifying the studies through the search strategy and the exclusion of the duplicates, using the reference manager Endnote Online, the screening was initiated by the simultaneous reading of titles and summaries. The studies were selected by the reading of the complete texts and, finally, those included in the review were indicated (Figure 1).

The data collection was carried out between October 2015 and March 2016. The eligibility criteria were: original studies in English, Portuguese and Spanish, conducted by nurses dealing with the application of cross-cultural adaptation methods in the nursing area, published between January 2010 and December 2015. The articles that did not describe the steps of the cross-cultural adaptation methodology, which only brought the translation step, studies that approached the construction or development of scales, and articles that addressed only the validation part of the adapted instruments were excluded.

For the extraction of data from the articles included in the integrative review, a previously used instrument was applied, which contemplates the following items: identification of the original article, methodological characteristics of the study, evaluation of the methodological rigor, the interventions measured and the results found[4].

In this study, the procedures of cross-cultural adaptation were evaluated using a strategy developed and applied in a chart format by other authors, which takes into account the adequacy of the studies to the methodological model that it has referenced[5].

In order to ensure the validity of the review, as well as the accuracy and clarification of the data and discussion, the studies were selected and analyzed in detail, with a focus on the adequacy of the methodology used by four researchers (students of the Nursing Postgraduate Program of UFPI, and of the discipline that guided the development of this article). In this phase, the experience of each author contributed to the validation of the methods and the results, besides helping to determine their usefulness in practice. The presentation of the results and discussion of the data obtained was done in a descriptive way, allowing the reader to evaluate the applicability of the described methods.

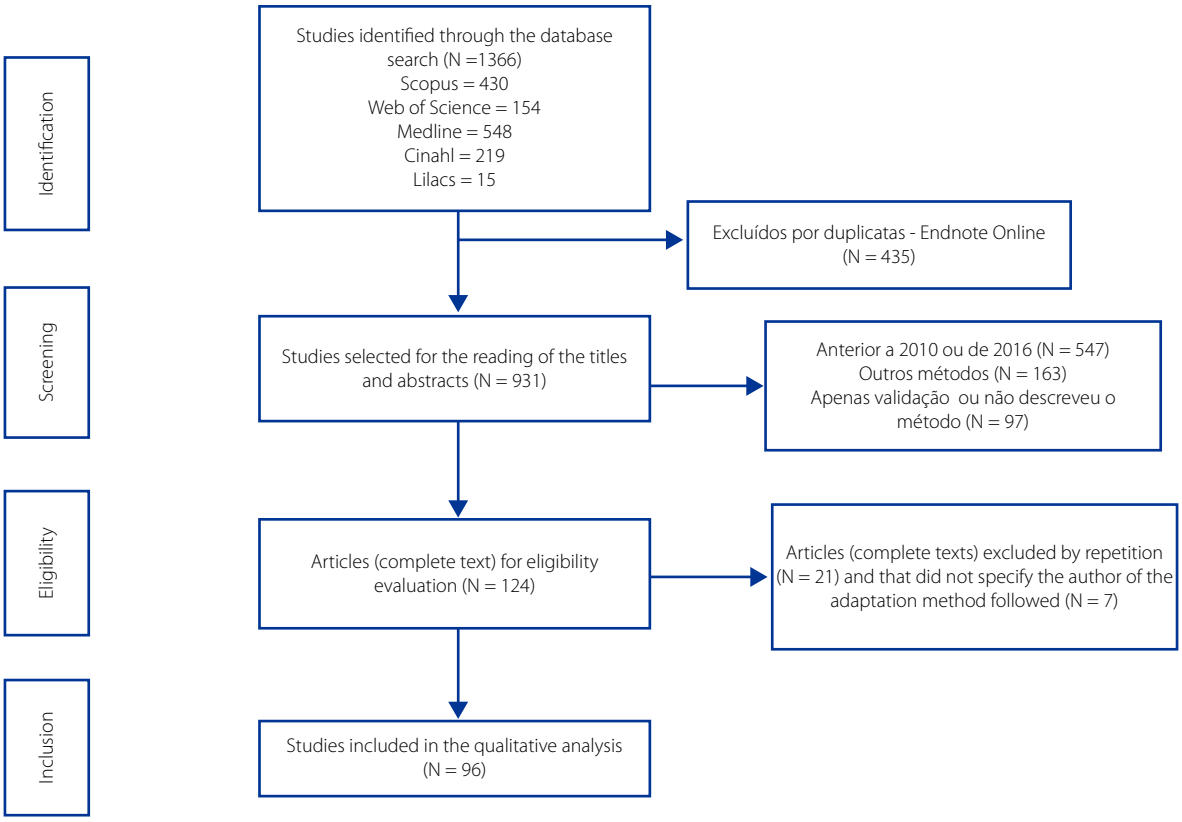

Figure 1 – Flowchart of the selection of the articles included in the integrative review

Source: Research data, 2016

RESULTS

The 96 articles selected are distributed in 59 different journals, of which 9 (15.2%) were Brazilian and concentrated 26.0% of the studies. Regarding the language, 92 (95.8%) presented at least one version in English, with 16.5% also in Portuguese and Spanish. The adapted instruments were, for the most part, specific to nursing 22 (21.9%). The second main focus was quality of life 10 (10.4%). The largest number of publications was in 2015, with 30 (31.2%). Twenty-eight countries appeared on the list, led by Brazil 33 (33.3%), followed by China 10 (10.4%) and Spain 9 (9.4%).

Twenty-seven different guidelines were used, most of which were produced in the 1990s. However, Guillemin, Bombardier, Beaton and Beaton[6], Bombardier, Guillemin, Ferraz[7-8] were cited in 47 (49.0%) articles; Brislin[9-12] in 12 (12.5%); Herdman, Fox-Rushby, Badia and Reichenheim, Moraes[13-14] appeared in 6 (6,2%); WHOQOL[15] and WHO[16] in 4 (4.2%); Bullinger et al.[17] in 3 (3.1%); as well as Geisinger[18] and Sousa, Rojjanasrirat[19], who were cited as methodology in 2 (2.1%). Other 20 (20.8%) methods were cited only once.

Chart 1 shows that, among the studies that used 27 cross-cultural adaptation methodologies[6-8] found in the selected articles, there was a predominance of publications in the year 2015 (12 articles). A detailed reading allowed the identification of studies whose cross-cultural adaptation processes were clearly described in the steps proposed by Beaton et al.[7-8] (Translation, Synthesis of translations, Back translation, Committee of experts and Pre-test), and whose validity and reliability have been proven in the selected articles themselves[20-26].

Chart 2 shows the description and the evaluation of the studies that used one of the versions of the cross-cultural adaptation method proposed by Brislin[9-12]. Four adequately followed the indications of the process as established by the author in the steps: Translation, Back translation, Semantic Equivalence and Pilot Study.

Chart 3 shows the studies in the nursing area that used models of cross-cultural adaptation developed by several authors and that were cited in at least two selected articles. According to a cross-cultural adaptation proposal, the authors[13-19] highlighted propose models whose methodological steps are mentioned in the chart. The articles selected, for the most part, meet the criteria established by the highlighted models.

Process of cross-cultural adaptation					
Authors/Year	***Translation***	***Synthesis of translations***	***Back translation***	***Committee of experts***	***Pre-test***
Arias-Rivera et al.,2013[20]	+	+	+	+	+
Pasin et al., 2013[21]	+	+	+	+	+
Sundborg et al., 2012[22]	+	+	+	+	?
Mota et al., 2015[23]	+	+	+	+	+
Schardosim et al., 2014[24]	+	+	+	+	+
Dorigan e Guirardello, 2013[25]	+	+	+	+	+
Limardi et al, 2014[26]	+	+	+	+	+
Nikfallah et al., 2014[27]	?	+	–	0	?
Raholm, Thorkildsen, Lofmark,2010[28]	?	+	–	?	+
Ferrari et al., 2010[29]	–	+	–	+	+
Chow et al., 2013[30]	–	0	–	?	?
Dahl et al., 2013[31]	–	+	–	?	?
Ndosi et al., 2011[32]	?	+	?	?	+
Sousa et al., 2015[33]	?	+	?	+	?
Knihs;.Schirmer; Roza, 2014[34]	?	+	+	+	+
Ribeiro et al.,2015[35]	?	+	+	?	+
Tomaszewski et al.,2015[36]	?	+	0	?	?
Reis et al., 2015[37]	?	0	+	?	+
Bernardino et al., 2013[38]	?	+	+	?	?
Saffi et al., 2013[39]	?	+	?	?	+
Klein et al., 2012[40]	?	+	+	?	?
Andreasen et al., 2014[41]	?	+	?	+	+
Ávila et al., 2013[42]	?	?	?	?	+
Hwang et al., 2015[43]	?	?	?	?	?
Ling-Juan et al., 2012[44]	?	?	?	?	?
Niu et al., 2015[45]	?	0	+	0	?
Vuillerot et al., 2014[46]	+	0	+	+	?
Tomaschewski-Barlem et al., 2015[47]	+	?	+	?	+
Matsuzaki et al., 2010[48]	+	?	+	?	?
Zhang et al., 2015[49]	+	?	+	+	+
Paz et al., 2014[50]	+	?	–	?	?
Romero-Sánchez et al., 2011[51]	+	+	–	+	?
Kajermo et al., 2012[52]	+	+	–	0	0
Gholizadeh et al., 2010[53]	+	0	–	0	0
Uchmanowicz et al.,2014[54]	+	+	?	+	+
Pelegrino et al., 2011[55]	+	+	+	?	?
Rabelo et al., 2012[56]	+	+	+	?	?
Monteiro, Almeida, Kruse, 2013[57]	+	+	+	?	+
Motta; Schardosim; Cunha, 2015[58]	+	+	+	?	+

Costa et al., 2014[59]	+	+	+	?	+
Mahiel et al., 2013[60]	+	+	+	?	?
Feijó et al., 2012[61]	+	+	+	?	+
Linch et al,. 2012[62]	+	+	+	?	+
Cinar et al., 2016[63]	+	+	+	?	+
Wong et al., 2014[64]	+	+	?	?	?
Fuentelsaz-Gallego et al., 2013[65]	+	+	+	0	0
Peduzzi et al.,2015[66]	?	+	+	?	+

Chart 1 - Evaluation of the compliance with the methodological steps of Beaton[7-8] and collaborators in the studies that used cross-cultural adaptation

Source: Research data, 2016.
Caption: (+) Step conducted according to the cross-cultural adaptation model cited; (?) Step with questionable design; (–) Translation and/or back translation led by 1 translator; (0) Not informed.

	Process of cross-cultural adaptation			
Authors/Year	***Translation***	***Back translation***	***Semantic Equivalence***	***Pilot Study***
Rchaidia et al., 2012[67]	+	0	+	+
Baker et al., 2010[68]	0	0	+	?
Kim;Chae;Yoo, 2012[69]	–	–	0	0
Rihani et al., 2010[70]	+	+	+	+
Chaboyer et al., 2012[71]	+	+	+	+
Tuthill et al., 2014[72]	–	+	?	0
Almutary;Bonner; Douglas,2015[73]	–	–	+	+
Bragadottir et al., 2015[74]	+	+	+	+
Chen et al., 2015[75]	?	+	+	+
Huang et al.,2016[76]	+	+	+	+
Liu et al.,20157[77]	–	–	+	+
Tosterud et al.,2015[78]	–	–	+	+

Chart 2 - Evaluation of the compliance with the methodological steps of Brislin[9-12] and collaborators in the studies that used cross-cultural adaptation

Source: Research data, 2016.
Caption: (+) Step conducted according to the cross-cultural adaptation model cited; (?) Step with questionable design; (–) Step not conducted according to the model of cross-cultural adaptation cited; (0) Step not performed.

Authors (model/articles)	**Process of cross-cultural adaptation**				
Herdman et al. (1998)[13]***; Reichenheim and Moraes (2007)***[14]	***Conceptual Equivalence***	***Items Equivalence***	***Semantic Equivalence***	***Operational Equivalence***	***Functional Equivalence***
Oliveira et al.,2011[79]	+	+	+	+	+
Aires et al., 2012[80]	+	+	+	+	+
Martinho; Martins; Angelo, 2013[81]	+	+	+	+	+
Paschoalin et al., 2013[82]	+	+	+	+	+
Trotte et al., 2014[83]	+	+	+	?	?
Soares; Luís; Hirata,2015[84]	+	+	+	+	+

World Health Organization (1993,2007)[15-16]	***Translation***	***Panel of Experts***	***Back Translation***	***Pre-test and Cognitive Interview***	***Final Version***
Haraldstad et al.,2011[85]	+	–	+	?	+
Campos; Marziale; Santos, 2013[86]	+	+	+	+	+
Gözüm; Tuzcu;Kirca, 2016[87]	+	+	+	–	+
Torres-Ortega; Peña-Amaro,2015[88]	+	–	+	–	+
Bullinger et al. (1993)[17]	***Translation (1and 2)***	***Common version***	***Translation Review (3 and 4)***	***Back translation***	***Pre-test***
Kobayashi;Kamibeppu, 2010[89]	+	+	0	?	+
Tayyebi et al., 2012[90]	+	+	0	+	+
Machón et al., 2014[91]	+	+	+	+	+
Geisinger (1994)[18]	***Translation***	***Back Translation***	***Back Translation Review***	***Experts Committee***	***Pre-test***
Lin et al., 2012[92]	+	0	0	+	+
Liu et al., 2012[93]	+	+	+	+	?
Sousa e Rojjanasrirat (2011)[19]	***Translation***	***Synthesis I***	***Back Translation***	***Synthesis II***	***Pilot Test***
Moradian et al.,2014[94]	+	+	+	+	+
He; Bonner; Anderson, 2015[95]	+	+	+	+	+

Chart 3 - Evaluation of the compliance with the methodological steps highlighted[13-19] in the studies that used cross-cultural adaptation

Source: Research data, 2016.
Caption: WHO=World Health Organization; (+) Step conducted according to the cross-cultural adaptation model cited; (?)Step with questionable design; (–) Step not conducted according to the cross-cultural adaptation model cited; (0) Step not performed.

DISCUSSION

In the studies evaluated in the nursing area, different recommendations and methodologies for the cross-cultural adaptation of instruments were found, which, although converging in some aspects, differed in others (use of technical translation, focus groups, etc.). However, there was a predominance of the use of different versions of the method developed by Beaton and collaborators in the years 1996, 2000 and 2007[6-8]. This demonstrated its applicability and ease of operation, which made it a reference for national and international use.

Considering the relevance of methodological studies, since they provided reliable and valid instruments of measurement, it was essential to use the method chosen to guide the whole process of cross-cultural adaptation. Thus, the cross-cultural equivalence of an instrument was proportional to the compliance with the process of cross-cultural adaptation of a given instrument to the methodology it was proposed to use.

In contrast, some authors added specificities to the method, in order to improve the cross-cultural adaptation of their instrument. These changes consisted in the addition of a translator[22,66], in the insertion of the evaluation of the synthesis of the translations by the original author of the instrument[33] and in the participation of the original author in the translation and back translation processes[58]. Regarding this decision, the cultural linguistic difficulties of the original author should be considered for the understanding and good evaluation of the initial translated version. Others have developed two pre-tests and two expert committees in order to improve and qualify the instrument's adaptation[22,40,63]. As for the pre-test, there were those who used a sample that was superior to the one suggested[58]. These changes were not always justified by the authors, which may be perceived as failure or limitation of the studies.

Considering the superficiality of the information on the steps of the cross-cultural adaptation process, some articles selected in the sample of this study were uncertain regarding the adequate accomplishment of the methods

that were proposed to perform. There were also articles with inconsistency in the fulfillment of the methodological steps guided by the chosen model[31-32,42,44,50,53,68,69].

For this reason, there were methods of cross-cultural adaptation that stood out due to the clarity and reliability with which they were developed in the selected articles. They are: Guillemin, Bombardier, Beaton and Beaton[6], Bombardier, Guillemin, Ferraz[7-8], they were cited in 47 (49.0%) articles; Brislin[9-12] in 12 (12.5%); Herdman, Fox-Rushby, Badia and Reichenheim, Moraes[13-14] appear in 6 (6.2%); WHOQOL[15] and WHO[16] in 4 (4.2%); Bullinger et al.[17] in 3 (3.1%), as well as Geisinger[18] and Sousa, Rojjanasrirat[19].

Although the back translation step is not mandatory, all the main guidelines[6-12,15-19] used as a cross-cultural adaptation model have identified it as essential. It is useful as a tool for communicating with the authors of the original version and it allows to identify possible discrepancies in the translation. The use of a rigorous methodology in the adaptation process helps to achieve the structural, linguistic and cultural equivalences of the instruments[96].

The second most cited guideline[9-12] stands out for pioneering the development of a methodological guide to the cross-cultural adaptation[96]. This process has four steps: the first three relate to the translation, back translation and the evaluation of the semantic equivalence, and the fourth step is the pilot study.

Regarding the contributions of the use of these guidelines[9-12]. the researchers concluded that the instruments were translated and validated appropriately according to the method used. The limitations, when mentioned in the body of the articles, listed aspects related to the sample, such as: low quantity and generalization, convenience or specific sampling of a given geographic region[75-77].

In addition to the two main methodological designs already described, it is worth highlighting the indications and guidelines of five other guidelines that were cited by at least two studies found in this review. The most comprehensive discussion of these works is done because, given the research objective, it is necessary to make these more employed methods known.

The model of cross-cultural adaptation of instruments[15-16]) was published on the Internet and included the process of: 1) translation; 2) panel of experts; 3) back translation; 4) pre-test and cognitive interview; 5) final version – is obtained as a result of all the previous steps. It is suggested that in each step a number is assigned to the version of the scale produced in order to facilitate evaluations.

Failure in applying this model focus on the panel of experts and pre-test steps. The lack of detailed description in some steps can also be attributed to the fact that these articles present, concurrently with the process of cross-cultural adaptation, the analysis of psychometric properties.

The idealizers[17] described the cross-cultural adaptation steps used with the Quality of Life Questionnaire -SF-36. The studies presented as main disagreement regarding the guideline the inclusion of the evaluation of a committee of experts in the subsequent step to the initial translation (1 and 2). In one of the studies, the back translation was performed by a single translator and then evaluated by the experts committee, then finally sent to the original author. In addition, the evaluation step performed by two other translators was not routinely performed.

Some authors[14] have developed a methodology for cross-cultural adaptation of instruments based on work[13]. This model included six aspects of equivalence: (1) conceptual (it looks for the existence of a common concept between the two populations, the one in which the scale was developed and the one in which it will be applied); (2) of items (critically examines the questions or items used so that they match in both languages); (3) semantics (the meaning of the words contained in the original instrument must be the same understood in the target population of the version); (4) operational (refers to the instrument format, measurement methods, form of application); (5) of measurement (refers to psychometric properties); and (6) functional (both instruments, original and new version, must measure the same concepts in different cultures).

It was observed that the studies that chose this method remained faithful to the predicted steps. In C 3 no equivalence of measurement was mentioned, because in this work the process of testing the psychometric properties was considered as an item only after the methodological process of cross-cultural adaptation.

In the studies that pointed out this methodology, there was non-compliance with the established rules with the non-accomplishment of back translation or the non-accomplishment of the pre-test. The lack of back translation is pointed out as a limitation of the approach because the final Chinese translation was not back translated to check for accuracy and consistency.

Finally, the authors[14] have proposed a clear and user-friendly guideline for translation, cross-cultural adaptation and validation of instruments or scales for health care research. Their proposal included the following steps: 1) initial translation by at least two bilingual and bi-cultural translators (with experience in the culture of the two countries); 2) synthesis I: comparison between the two translations and the original version by a third bilingual translator. Discrepancies should be discussed in a group to obtain a preliminary translated version; 3) blind black translation of the

draft by at least two translators whose mother tongue is the same as the original version of the scale; 4) synthesis II: comprises the comparison of the two back translated versions with the original, obtaining a pre-final version of the scale. And step five refers to the pilot test of the pre-final version with a sample that can range from 10 to 40 subjects[19].

The authors[14] included two more steps for validation. This methodology is recent and incorporates a number of other methods, which are detailed and easy to apply. The two studies that used it followed strictly the determined steps. It was observed that, although produced in America, the countries that used it are China and Iran[94-95].

The other methodological models used[18-19], even though they presented their particularities, were consistent in performing translation, back translation, pre-test (not necessarily in that order). In some cases, these steps would be carried out through focus groups. In one of these, the model followed closely resembles that of the group[97].

An important point is that, although the authors[14] defined a main model to follow the adaptation of the focus instrument, in almost all the studies secondary authors who also have guidelines for this process were cited. This has often been done in an attempt to justify an inadequacy in the development of the main method chosen. In others, it seems to serve as a backing for the main model.

CONCLUSION

The study presented a compilation of information on the different methodological guidelines applied to the cross-cultural adaptation of instruments in the context of nursing.

The recurrence of the method conceived by Beaton and collaborators indicated its importance and suggested a tacit consensus regarding the most appropriate theoretical and methodological reference. All the methods employed coincided with the use of back translation, and several studies in different languages and countries have pointed to the international acceptability of this methodology.

Although searches have been conducted on the most widely used databases (including local and international, health-specific and multi-disciplinary databases), some studies may not have been captured, since some nursing journals may not have been indexed in any of the bases used, which is a limitation of this review. In addition, there may be data regarding the cross-cultural adaptation methods used that have not been described in the study, although they may be present in the original dissertation and thesis versions.

As a contribution of this study, it should be highlighted the detailed description of different methodological processes, which can serve as an important research source for the planning and development of future studies of nurses focused on the cross-cultural adaptation of instruments.

REFERENCES

1. Manzi-Oliveira AB, Balarini FB, Marques LAS, Pasian SR. [Cross-cultural adaptation of psychological assessment instruments: Brazilian literature review from 2000 to 2010]. Psico-USF. 2011;16(3):367-81. Portuguese.
2. Khalaila R. Translation of questionnaires into arabic in cross-cultural research: techniques and equivalence issues. J Transcult Nurs. 2015;24(4):363-70.
3. Whittemore R, Knafl K. The integrative review: updated methodology. J Adv Nurs. 2005;52(5):546-53.
4. Souza MT, Silva MD, Carvalho R. Revisão integrativa: o que é e como fazer. Einstein. 2010;8(1):102-6.
5. Oliveira IS, Costa LCM, Fagundes FR, Cabral CM. Evaluation of cross-cultural adaptation and measurement properties of breast cancer-specific quality-of-life questionnaires: a systematic review. Qual Life Res. 2015;24(5):1179-95.
6. Guillemin F, Bombardier C, Beaton D. Cross-cultural adaptation of health-related quality of life measures: Literature review and proposed guidelines. J Clin Epidemiol. 1993;46(12):1417-32.
7. Beaton D, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. Spine (Phila Pa 1976). 2000;25(24):3186-91.
8. Beaton D, Bombardier C, Guillemin F, Ferraz MB. Recommendations for the cross-cultural adaptation of the DASH & QuickDASH outcome measures. Institute for Work & Health; 2007 [cited 2016 Jan 26]. Available from: http://www.dash.iwh.on.ca/sites/dash/files/downloads/cross_cultural_adaptation_2007.pdf .
9. Brislin RW. Back-translation for cross-cultural research. J Cross-Cult Psychol. 1970;1(3):185-216.
10. Brislin RW, Lonner WJ, Thorndike RM. Cross-cultural research method. New York: Wiley; 1973.
11. Brislin RW. Handbook of cross-cultural psychology: methodology. Boston: Allyn and Bacon; 1980.
12. Brislin RW. The wording and translation of research instruments. In: Berry JW. Field methods in cross-cultural research. Beverly Hills: Sage Publications; 1986. p. 137-64.
13. Herdman M, Fox-Rushby J, Badia X. A model of equivalence in the cultural adaptation of HRQoL instruments: the universalist approach. Qual Life Res. 1998;7(4):323-35.
14. Reichenheim M, Moraes C. Operationalizing the cross-cultural adaptation of epidemological measurement instruments. Rev SaúdePública. 2007; 41(4):665-73.
15. Study protocol for the World Health Organisation project to develop a quality of life assessment instrument (WHOQOL). Qual Life Res. 1993;2(2):153-9.
16. World Health Organization (CH). Process of translation and adaptation of instruments. Geneva: WHO; 2007 [cited 2016 Jan 26]. Available from: http://www.who.int./substance-abuse/research--tools/translation/en.
17. Bullinger M, Alonso J, Apolone G, Leplège A, Sullivan M, Wood-Dauphinee S, et al. Translating health status questionnaires and evaluating their quality: the IQOLA project approach. J Clin Epidemiol. 1998;51(11):913-23.
18. Geisinger KF. Cross-cultural normative assessment: translation and adaptation issues influencing the normative interpretation of assessment instruments. Psychol Assess. 1994;6(4):304-12.

19. Sousa VD, Rojjanasrirat W. Translation, adaptation and validation of instruments or scales for use in cross cultural health care research: a clear and user friendly guideline. J Eval Clin Pract. 2011;17(2):268-74.
20. Arias-Rivera S, Sánchez-Sánchez MM, Fraile-Gamo MP, Patiño-Freire S, Pinto-Rodríguez V, Conde-Alonso MP, et al. Transcultural adaptation into Spanish of the Nursing Activities Score. Enferm Intensiva. 2013;24(1):12-22.
21. Pasin S, Avila F, Cavatá T, Hunt A, Heldt E. Cross-cultural translation and adaptation to Brazilian Portuguese of the paediatric pain profile in children with severe cerebral palsy. J Pain Symptom Manage. 2013;45(1):120-8.
22. Sundborg E, Tornkvist L, Wandell P, Saleh-Stattin N. Cross-cultural adaptation of an intimate partner violence questionnaire. Clin Nurs Res. 2012;21(4):450-66.
23. Mota FRD, Victor JF, Silva MJ, Bessa MEP, Amorim VL, Cavalcante M, et al. Cross-cultural adaptation of the Caregiver Reaction Assessment for use in Brazil with informal caregivers of the elderly. Rev Esc Enferm USP. 2015;49(3):424-31.
24. Schardosim JM, Ruschel LM, da Motta GDP, Cunha MLC. Cross-cultural adaptation and clinical validation of the Neonatal Skin Condition Score to Brazilian Portuguese. Rev Latino-Am Enfermagem. 2014;22(5):834-41.
25. Dorigan GH, Guirardello ED. Translation and cross-cultural adaptation of the Newcastle Satisfaction with Nursing Scales into the Brazilian culture. Rev Esc Enferm USP. 2013;47(3):561-7.
26. Limardi S, Rocco G, Stievano A, Vellone E, Valle A, Torino F, et al. Cultural adaptation and linguistic validation of the Family Decision Making Self Efficacy Scale (FDMSES). Ann Ig. 2014;26(4):355-66.
27. Nikfallah A, Rezaali S, Mohammadi N, Abrishamkar M, Rezaei E, Sahraian MA, et al. Translation, cultural adaptation and validation of the Qualiveen-30 Questionnaire in Persian for patients with spinal cord injury and multiple sclerosis. Low Urin Tract Symptoms. 2015;7(1):42-9.
28. Råholm MB, Thorkildsen K, Löfmark A. Translation of the Nursing Clinical Facilitators Questionnaire (NCFQ) to Norwegian language. Nurse Educ Pract. 2010;10(4):196-200.
29. Ferrari AL, Baptista PCP, Felli VEA, Coggon D. Translation, adaptation and validation of the "cultural and psychosocial influences on disability (CUPID) questionnaire" for use in Brazil. Rev Latino-Am Enfermagem. 2010;18(6):1092-8.
30. Chow KM, Chan CW, Choi KC, Shiu AT, Cheng KK, Ip WY, et al. Psychometric properties of the Chinese version of Sexual Function After Gynecologic Illness Scale (SFAGIS). Support Care Cancer. 2013;21(11):3079-84.
31. Dahl O, Wickman M, Wengström Y. The cultural adaptation and validation of a Swedish version of the satisfaction with appearance scale (SWAP-Swe). Burns. 2014;40(4):598-605.
32. Ndosi M, Tennant A, Bergsten U, Kukkurainen ML, Machado P, de la Torre-Aboki J, et al. Cross-cultural validation of the Educational Needs Assessment Tool in RA in 7 European countries. BMC Musculoskelet Disord. 2011;12:110.
33. Sousa P, Gaspar P, Fonseca H, Hendricks C, Murdaugh C. Health promoting behaviors in adolescence: validation of the Portuguese version of the Adolescent Lifestyle Profile. J Pediatr (Rio J). 2015;91(4):358-65.
34. Neide SK, Janine S, Bartira AR. Cross-cultural translation of quality instruments in the organ donation process. Acta Paul Enferm. 2014;27(1):56-62.
35. Ribeiro SG, Symon AG, Lessa PR, Oliveira MF, Aquino PS, Almeida PC, et al. Translation and cultural adaptation of the Mother-Generated Index into Brazilian Portuguese: a postnatal quality of life study. Midwifery. 2015;31(7):735-41.
36. Tomaszewski KA, Henry BM, Paradowski J, Klosiński M, Walocha E, Golec J, et al. Cross cultural adaptation of the English version of the IOF-QLQ to Polish, to assess the health-related quality-of-life of patients after a distal radius fracture. Health Qual Life Outcomes. 2015;13:158.
37. Reis PAM, Carvalho ZMD, Tirado Darder JJ, Oria MOB, Studart RMB, Maniva S. Cross-cultural adaptation of the Quality of Life Index Spinal Cord Injury - Version III. Rev Esc Enferm USP. 2015;49(3):401-8.
38. Bernardino E, Dyniewicz AM, Carvalho KLB, Kalinowski LC, Banat WH. Transcultural adaptation and validation of the Conditions of Work Effectiveness - Questionnaire-II instrument. Rev Latino-Am Enfermagem. 2013;21(5):1112-8.
39. Saffi MA, Macedo Júnior LJJ, Trojahn MM, Polanczyk CA, Rabelo-Silva ER. Validity and reliability of a questionnaire on knowledge of cardiovascular risk factors for use in Brazil. Rev Esc Enferm USP. 2013;47(5):1084-90.
40. Klein C, Linch GFC, Souza EN, Mantovani VM, Goldmeier S, Rabelo R. [Cross-cultural adaptation and validation of a questionnaire on what nurses know of heart failure]. Rev Gaúcha Enferm. 2012;33(1):19-25. Portuguese.
41. Andreasen J, Sørensen EE, Gobbens RJ, Lund H, Aadahl M. Danish version of the Tilburg Frailty Indicator--translation, cross-cultural adaption and validity pretest by cognitive interviewing. Arch Gerontol Geriatr. 2014;59(1):32-8.
42. Avila CW, Riegel B, Pokorski SC, Camey S, Silveira LC, Rabelo-Silva ER. Cross-cultural adaptation and psychometric testing of the Brazilian version of the self-care of heart failure index version 6.2. Nurs Res Pract. 2013:178976.
43. Hwang AW, Yen CF, Liou TH, Bedell G, Granlund M, Teng SW, et al. Development and validation of the ICF-CY-Based Functioning Scale of the Disability Evaluation System-Child Version in Taiwan. J Formos Med Assoc. 2015;114(12):1170-80.
44. Ling-Juan Z, Jie C, Jian L, Xiao-Ying L, Ping F, Zhao-Fan X, et al. Development of quality of life scale in Chinese burn patients: cross-cultural adaptation process of burn-specific health scale - brief. Burns. 2012;38(8):1216-23.
45. Niu Y, Zhang W, Mao S, Gao Y, Wang J, Li J, et al. Pilot feasibility research of Chinese version of kidney transplant questionnaire in recipients of living donor kidney transplantation. Int J Clin Exp Med. 2015;8(12):22570-6.
46. Vuillerot C, Meilleur KG, Jain M, Waite M, Wu T, Linton M, et al. English cross-cultural translation and validation of the neuromuscular score: a system for motor function classification in patients with neuromuscular diseases. Arch Phys Med Rehabil. 2014;95(11):2064-70.e1.
47. Tomaschewski-Barlem JG, Lunardi VL, Barlem ELD, Silveira RS, Dalmolin GD, Ramos AM. Cross-cultural adaptation and validation of the Protective Nursing Advocacy Scale for Brazilian nurses. Rev Latino-Am Enfermagem. 2015;23(4):669-76.
48. Matsuzaki M, Haruna M, Ota E, Yeo S, Murayama R, Murashima S. Translation and cross-cultural adaptation of the Pregnancy Physical Activity Questionnaire (PPAQ) to Japanese. Biosci Trends. 2010;4(4):170-7.
49. Zhang YP, Zhao XS, Zhang B, Zhang LL, Ni CP, Hao N, et al. Cross-cultural adaptation and psychometric assessment of the Chinese version of the comprehensive needs assessment tool for cancer caregivers (CNAT-C). Qual Life Res. 2015;24(7):1607-14.
50. Paz EPA, Parreira P, Lobo ADS, Palasson RR, Farias SNP. Cross-cultural adaptation of the primary health care satisfaction questionnaire. Acta Paul Enferm. 2014;27(5):419-26.
51. Romero-Sánchez JM, Paramio-Cuevas JC, Paloma-Castro O, Pastor-Montero SM, O'Ferrall-González C, Gabaldón-Bravo EM, et al. The Spanish version of the Position on Nursing Diagnosis scale: cross-cultural adaptation and psychometric assessment. J Adv Nurs. 2013;69(12):2759-71.
52. Kajermo KN, Boe H, Johansson E, Henriksen E, McCormack B, Gustavsson JP, et al. Swedish translation, adaptation and psychometric evaluation of the Context Assessment Index (CAI). Worldviews Evid Based Nurs. 2013;10(1):41-50.
53. Gholizadeh L, Salamonson Y, Davidson PM, Parvan K, Frost SA, Chang S, et al. Cross-cultural validation of the Cardiac Depression Scale in Iran. Br J Clin Psychol. 2010;49(4):517-28.

54. Uchmanowicz I, Loboz-Rudnicka M, Jaarsma T, Loboz-Grudzien K. Cross-cultural adaptation and reliability testing of Polish adaptation of the European Heart Failure Self-care Behavior Scale (EHFScBS). Patient Prefer Adherence. 2014;8:1521-6.
55. Pelegrino FM, Dantas RA, Corbi IS, Carvalho ARS, Schmidt A, Pazin Filho A. Cross-cultural adaptation and psychometric properties of the Brazilian-Portuguese version of the Duke Anticoagulation Satisfaction Scale. J Clin Nurs. 2012;21(17-18):2509-17.
56. Rabelo ER, Mantovani VM, Aliti GB, Domingues FB. Cross-cultural adaptation and validation of a disease knowledge and self-care questionnaire for a Brazilian sample of heart failure patients. Rev Latino-Am Enfermagem. 2011;19(2):277-84.
57. Monteiro DR, Almeida MA, Kruse MHL. Translation and cross-cultural adaptation of the Edmonton Symptom Assessment System for use in palliative care. Rev Gaucha Enferm. 2013;34(2):163-71.
58. Motta GDCP, Schardosim JM, Cunha MLC. Neonatal infant pain scale: cross-cultural adaptation and validation in Brazil. J Pain Symptom Manage. 2015;50(3):394-401.
59. Costa GD, Souza RA, Yamashita CH, Pinheiro JCF, Alvarenga MRM, Oliveira MAC. Evaluation of professional knowledge and attitudes on dementia patient care: a trans-cultural adaptation of an evaluation instrument. Rev Esc Enferm USP. 2014;49(2):298-308.
60. Mahieu L, Casterle BD, Van Elssen K, Gastmans C. Nurses' knowledge and attitudes towards aged sexuality: validity and internal consistency of the Dutch version of the Aging Sexual Knowledge and Attitudes Scale. J Adv Nurs. 2013;69(11):2584-96.
61. Feijó MK, Avila CW, Souza EN, Jaarsma T, Rabelo ER. Cross-cultural adaptation and validation of the European Heart Failure Self-care Behavior Scale for Brazilian Portuguese. Rev Latino-Am Enfermagem. 2012;20(5):988-96.
62. Linch GFD, Müller-Staub M, Moraes MA, Azzolin K, Rabelo ER. Cross-cultural adaptation of the Quality of Diagnoses, Interventions and Outcomes (Q-DIO) instrument into Brazilian Portuguese. Int J Nurs Knowl. 2012;23(3):153-8.
63. Cinar FI, Cinar M, Yilmaz S, Acikel C, Erdem H, Pay S, et al. Cross-Cultural adaptation, reliability, and validity of the Turkish Version of the Compliance Questionnaire on Rheumatology in patients with Behçet's disease. J Transcult Nurs. 2016;27(5):480-6.
64. Wong JY, Fong DY, Choi AW, Chan CK, Tiwari A, Chan KL, et al. Transcultural and psychometric validation of the Dispositional Resilience Scale (DRS-15) in Chinese adult women. Qual Life Res. 2014;23(9):2489-94.
65. Fuentelsaz-Gallego C, Moreno-Casbas MT, Gonzalez-Maria E. Validation of the Spanish version of the questionnaire Practice Environment Scale of the Nursing Work Index. Int J Nurs Stud. 2013;50(2):274-80.
66. Peduzzi M, Norman I, Coster S, Meireles E. Cross-cultural adaptation of the Readiness for Interprofessional Learning Scale in Brazil. Rev Esc Enferm USP. 2015;49(spe2):7-14.
67. Rchaidia L, Casterle BD, Verbeke G, Gastmans C. Oncology patients' perceptions of the good nurse: an explorative study on the psychometric properties of the Flemish adaptation of the Care-Q instrument. J Clin Nurs. 2012;21(9-10):1387-400.
68. Baker DL, Melnikow J, Ly MY, Shoultz J, Niederhauser V, Diaz-Escamilla R. Translation of health surveys using mixed methods. J Nurs Scholarsh. 2010;42(4):430-8.
69. Kim CJ, Chae SM, Too H. Psychometric testing of the Chronic Disease Self-Efficacy Scale-Korean Version (CDSES-K). J Transcult Nurs. 2012:23(2):173-80.
70. Rohani C, Khanjari S, Abedi HA, Oskouie F, Langius-Eklöf A. Health index, sense of coherence scale, brief religious coping scale and spiritual perspective scale: psychometric properties. J Adv Nurs. 2010;66(12):2796-806.
71. Chaboyer W, Lee BO, Wallis M, Chien CS. Taiwanese translation and psychometric testing of the revised illness perception questionnaire for patients with traumatic injury. J Clin Nurs. 2012;21(23-24):3466-74.
72. Tuthill EL, Butler LM, McGrath JM, Cusson RM, Makiwane GN, Gable RK, et al. Cross-cultural adaptation of instruments assessing breastfeeding determinants: a multi-step approach. Int Breastfeed J. 2014;9:16.
73. Almutary H, Bonner A, Douglas C. Arabic translation, adaptation and modification of the Dialysis Symptom Index for chronic kidney disease stages four and five. BMC Nephrol. 2015;16:36.
74. Bragadottir H, Kalisch BJ, Smaradottir SB, Jonsdottir HH. Translation and psychometric testing of the Icelandic version of the MISSCARE Survey. Scand J Caring Sci. 2015;29(3):563-72.
75. Chen CW, Chu H, Tsai CF, Yang HL, Tsai JC, Chung MH, et al. The reliability, validity, sensitivity, specificity and predictive values of the Chinese version of the Rowland Universal Dementia Assessment Scale. J Clin Nurs. 2015;24(21-22):3118-28.
76. Huang FF, Yang Q, Zhang J, Zhang QH, Khoshnood K, Zhang JP. Cross-cultural validation of the moral sensitivity questionnaire-revised Chinese version. Nurs Ethics. 2016;23(7):784-93.
77. Liu M, Chow A, Lau Y, He HG, Wang W. Psychometric testing of the Chinese Mandarin version of the Mental Health Inventory among Chinese patients with coronary heart disease in Mainland China. Int J Nurs Pract. 2015;21(6):913-22.
78. Tosterud R, Polit C, Petzäll K, Wangensteen S, Hall-Lord ML. Cross-cultural validation and psychometric testing of the questionnaire: Debriefing Experience Scale. Clin Simul Nurs. 2015;11(1):27-34.
79. Oliveira PDM, Fem andes HIV, Vilar A, Figueiredo M, Ferreira M, Martinho M, et al. Attitudes of nurses towards families: validation of the scale Families' Importance in Nursing Care - Nurses Attitudes. Rev Esc Enferm USP. 2011;45(6):1329-35.
80. Aires M, Weissheimer AM, Rosset I, Oliveira FA, Morais EP, Paskulin LMG. Transcultural adaptation of the filial responsibility interview schedule for Brazil. Int Nurs Rev. 2012;59(2):266-73.
81. Martinho MJCM, Martins MMFPS, Angelo M. Scale of conflict in health care decision-making: an instrument adapted and validated for the Portuguese language. Rev Esc Enferm USP. 2013;47(3):575-82.
82. Campos PH, Harter GR, Luz LMT, Bandeira de MDC. Transcultural adaptation and validation of the Stanford Presenteeism Scale for the evaluation of presenteeism for Brazilian Portuguese. Rev Latino-Am Enfermagem. 2013;21(1):388-95.
83. Trotte LAC, Lima CFM, Pena TLN, Ferreira AMO, Caldas CP. Cross-cultural adaptation of the End of Life Comfort Questionnaire-Patient to Brazilian Portuguese. Rev Enferm UERJ. 2014;22(4).
84. Soares MH, Luis MA, Hirata AG. Cross-cultural cultural adaptation of the "Nursing Students' Attitudes Toward Mental Health Nursing and Consumers" in Brazil. Rev Bras Enferm. 2015;68(2):174-81, 198-205.
85. Haraldstad K, Christophersen KA, Eide H, Nativg GK, Helseth S. Health related quality of life in children and adolescents: reliability and validity of the Norwegian version of KIDSCREEN-52 questionnaire, a cross sectional study. Int J Nurs Stud. 2011;48(5):573-81.
86. Campos MCT, Marziale MHP, Santos JLF. Cross-cultural adaptation and validation of the World Health Organization Health and Work Performance Questionnaire to Brazilian nurses. Rev Esc Enferm USP. 2013;47(6):1337-43.
87. Gözüm S, Tuzcu A , Kirca N. Validity and reliability of the Turkish version of the Nurse Cultural Competence Scale. J Transcult Nurs. 2016;27(5):487-95.

88. Torres-Ortega C, Peña-Amaro P. [Cross-cultural adaptation of the Mishel uncertainty in illness scale, in a population with chronic kidney disease treated with hemodialysis]. Enferm Clin. 2015;25(1):9-18. Spanish.
89. Kobayashi K, Kamibeppu K. Measuring quality of life in Japanese children: development of the Japanese version of PedsQL. Pediatr Int. 2010;52(1):80-8.
90. Tayyebi A, Raiesifar A, Najafi-Mehri S, Ebadi A, Einolahi B, Pashandi S. Measuring Health Related Quality of Life (Hrqol) in renal transplant patients: psychometric properties and cross-cultural adaptation of Kidney Transplant Questionnaire (Ktq-25) in Persian. Nephrourol Mon. 2012;4(4):617-21.
91. Machon M, Vergara I, Silvestre C, Perez P, Alias G, Vrotsou K. [Cross-cultural adaptation into Spanish of the Nursing Home Survey on Patient Safety Culture questionnaire]. Rev Calid Asist. 2014;29(2):99-103. Spanish.
92. Lin YP, Kao TS, McCullagh MC, Edington DW, Larson JL. Translation and psychometric properties of the Chinese version of the perceived workplace environment scale in Taiwanese information technology professionals. J Occup Health. 2012;54(3):223-31.
93. Liu J, Leung P, Sun R, Li HT, Liu JM. Cross-cultural application of Achenbach System of Empirically Based Assessment: instrument translation in Chinese, challenges, and future directions. World J Pediatr. 2012;8(1):5-10.
94. Moradian S, Shahidsales S, Ghavam-Nasiri MR, Pilling M, Molassiotis A, Walshe C. Translation and psychometric assessment of the Persian version of the Rhodes Index of Nausea, Vomiting and Retching (INVR) scale for the assessment of chemotherapy-induced nausea and vomiting. Eur J Cancer Care (Engl). 2014;23(6):811-8.
95. He W, Bonner A, Anderson D. Translation and psychometric properties of the Chinese version of the Leeds Attitudes to Concordance II scale. BMC Med Inform Decis Mak. 2015;15:60.
96. Epstein J, Santo RM, Guillemin F. A review of guidelines for cross-cultural adaptation of questionnaires could not bring out a consensus. J Clin Epidemiol. 2015;68(1):435-41.
97. Castelo Branco EMS, Peixoto MAP, Alvim NAT. Translation and adaptation of the action control scale aimed at nursing care. Texto Contexto Enferm. 2015;24(2):371-80.

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