Evaluation of the Translation, Cross-cultural Adaptation and Properties of Measurement of the FACT-BMT Questionnaire

Thalissa Maniaes¹, Ana Paula Carraro² and Indiara Soares Oliveira³

1. Master’s and Residency Program/Multiprofessional Development in Oncological Physical Therapy, Antonio Prudente Foundation - A.C. Camargo Cancer Center, Rua Antonio Prudente, 211 - Liberdade, São Paulo-SP 01509-010, Brazil
2. Residency Program/Multiprofessional Development in Oncological Physical Therapy, Antonio Prudente Foundation - A.C. Camargo Cancer Center, Rua Antonio Prudente, 211 - Liberdade, São Paulo-SP 01509-010, Brazil
3. Master’s and PhD Program, Universidade Cidade de São Paulo (Unicid) / A.C. Camargo Cancer Center, Rua Antonio Prudente, 211 - Liberdade, São Paulo-SP 01509-010, Brazil

Abstract: Various questionnaires have been described which evaluate the quality of life in patients undergoing cancer treatment, but most were originally developed in English and have not been adequately validated for other languages. To evaluate the process of translation and cross-cultural adaptation and the measurement properties of the Functional Assessment of Cancer Therapy-Bone Marrow Transplantation (FACT-BMT) questionnaire, a systematic review was conducted with two independent evaluators. The search for articles was carried out in four databases: MEDLINE, EMBASE, CINAHL and SCIELO, using the terms “questionnaire”, “quality of life”, “oncology”, and “valid” and their descriptors according to MeSH and DeCs. The searches yielded 6,877 studies, of which only three performed the stages of translation, cross-cultural adaptation, and evaluation of the measurement properties of the FACT-BMT questionnaire. The instruments in Arabic, Chinese, Korean and Portuguese showed and presented good methodological quality, but none of the four studies followed all the validation criteria for the questionnaire. The adapted versions of the FACT-BMT have methodological weaknesses in their process of translation and cross-cultural adaptation and evaluation of measurement properties, therefore the questionnaires possibly being used inadequately in other languages.

Key words: FACT-BMT, questionnaire, quality of life, translation, cross-cultural adaptation and measurement properties.

Highlights

• Several questionnaires are available to assess the quality of life.
• The FACT-BMT was developed in the English language and used in different cultures.
• Cross-cultural adaptation should maintain the measurement properties.
• This questionnaire is being used in clinical practice without adequate validation.

1. Introduction

The Functional Assessment of Cancer Therapy-Bone Marrow Transplantation (FACT-BMT) is a simple, brief and self-administered questionnaire with 50-item developed in English language which consists of a multidimensional assessment of the functional aspects and quality of life (QoL) of patients submitted to hematopoietic stem cell transplantation (HSCT). This questionnaire is a combination of BMT domain (named as Additional Concerns) added to the FACT-G. The FACT-G is a 27-item questionnaire of general questions divided into four primary quality of life domains: physical well-being (PWB; 7-items), social/family well-being (SWB; 7-items), emotional...
well-being (EWB; 6-items); and functional well-being (FWB; 7-items). The BMT domain has 23 items, 18 items addressing the BMT related side effects, specifically designed to assess the BMT patients’ quality of life [1]. Five other questions from different QoL questionnaire were added in the BMT domain as they were considered relevant to FACT-BMT [1]. The standard treatment for leukemia, lymphoma, and multiple myeloma (MM) is the hematopoietic stem cell transplantation (HSCT) [2, 3], which consists of intravenous infusion of hematopoietic progenitor cells with the objective of restoring marrow function in the patients, replacing the diseased bone marrow [4].

HSCT affects the physical, functional, and emotional well-being of the patient due to several factors such as prolonged hospitalization, isolation, intensive care regimen, morbidity, and high mortality risk [5] due to the immunosuppression induced by the pre-HSCT conditioning regimen. This regimen makes the patient temporarily vulnerable to complications that not only risk their physical integrity, but also their lives, and 40% of the patients who undergo this therapy show an unfavorable clinical course [6]. HSCT is associated with various psychological, physical, and social challenges that affect the patients’ quality of life (QoL) [7-10] and is mainly related to the chronic complications and the family structure of each patient and tends to improve over time [11]. In order to evaluate pain, disability related to treatment, and quality of life, as well as provide a prognosis, collect patient information, and define treatment, health professionals use resources such as the QoL evaluation questionnaires described in the literature, most of which have been originally developed in English [12].

However, since the world’s population does not share the same language, culture, or lifestyle, researchers must adapt the original questionnaire so that it is comprehensible and relevant in its new version, while also being faithful to the original when applied in clinical practice in other countries. This process is known as translation and cultural adaptation [12]. The process of cross-cultural adaptation aims to create equivalence between the original questionnaire and that used in another country to maintain validation of the content as well as interchangeability with the original version. An inadequate translation and adaptation process can lead to an instrument that is not equivalent to the original questionnaire [13, 14].

Therefore, the aim of this study was to conduct a systematic review to evaluate the methodological quality of the process of translation/cross-cultural adaptation of the FACT-BMT questionnaire [1] into different languages and cultures and of the evaluation of its measurement properties.

2. Materials and Methods

2.1 Search Strategy

The search was performed in the databases MEDLINE, CINAHL, EMBASE, and BIREME (SCIELO) using the terms “questionnaire”, “quality of life”, “oncology”, and “valid” and their descriptors according to MeSH in English and DeCS in Portuguese (Appendix 1). The last search was performed on 15/08/2018.

2.2 Inclusion and Exclusion Criteria

We selected only those studies that used a translated version of the FACT-BMT instrument [1], without restriction of year of publication, exclusively in patients submitted to HSCT. The exclusion criteria were duplicate studies between databases, title and abstracts unrelated to the theme, studies in the original language, and systematic reviews. Conference documents, book chapters, conference proceedings, dissertations, and these were also excluded, as well as studies not found in full or not provided by the authors after contact by e-mail.

2.3 Data Extraction

Study selection was carried out by two independent evaluators, who first made the exclusion by reading the titles and abstracts and then by reading the full text.
After inclusion of the studies, the evaluators extracted the information on translation/cross-cultural adaptation and measurement properties. In case of disagreement among the evaluators, a third evaluator would be consulted, however this was not necessary in this instance.

2.4 Translation and Cross-cultural Adaptation

The translation and cross-cultural adaptation process was evaluated in this review according to the guidelines of Beaton et al. [15] and includes (1) translation: two translations of the original document must be carried out by different bilingual translators; (2) synthesis of translation: the two translators and another member synthesize the results of the translations, producing a common translation; (3) backtranslation: two or more translators do a new translation into the instrument’s source language, generating a consensus translation; (4) analysis by an expert committee: the aim is to consolidate the versions of the questionnaire and develop the pre-final version; and (5) pre-test of the pre-final version: the pre-final version of the questionnaire is tested and the participants correspond to the target audience of the questionnaire, ensuring that the adapted version is equivalent to the original (Table 1).

2.5 The Measurement Properties

The evaluation of the measurement properties of the instrument should be carried out with the purpose of ascertaining its applicability after cross-cultural adaptation, since there are cultural differences between the populations. The present review followed the quality criteria described by Terwee et al. [16], which includes (1) internal consistency: the inter-relationship between the items of a scale or subscale verifying the homogeneity among the various items related to each other using Cronbach’s alpha; (2) validity of the construct: the degree to which the scores of an instrument are consistent with the hypotheses; (3) reproducibility (agreement and reliability): the degree to which repeated measures in stable participants provide similar answers; (4) responsiveness: an instrument’s ability to detect clinical changes over time of the construct to be measured and the ceiling and floor effects, considered present when more than 15% of the participants achieve the maximum or minimum scores (Table 2).

Table 1 Description of the methodology for evaluation of the quality criteria of the translation and cross-cultural adaptation of health questionnaires [15-19].

| Phases of translation and cross-cultural adaptation | Quality criteria used to evaluate the process of translation and cross-cultural adaptation |
|---------------------------------------------------|---------------------------------------------------------------------------------------|
| Translation                                        | + Translation by independent translators (two or more); ? Doubtful process; - Translation done by only one translator; 0 The translation process was not reported. + Synthesis completed; ? Doubtful process; 0 The process of synthesis of translations was not reported. |
| Synthesis of translations                          | + Back translation by independent translators (two or more). ? Doubtful process. - Back translation done by only one translator. 0 The back-translation process was not reported. |
| Back translation                                   | + The presence of an expert committee has been clearly described. ? Doubtful process. 0 The review process of the expert committee was not reported. + The pre-test of the pre-final version was carried out in the target population. |
| Expert committee                                   | + Positive rating; ? Indeterminate rating; - Negative rating; 0 = No information available. |
| Test of pre-final version                          | ? Doubtful process. 0 The pre-test of the pre-final version was not reported. |
Table 2 Description of the methodology for evaluation of the quality of the measurement properties of health questionnaires [16-19].

| Properties               | Quality criteria                                                                 |
|--------------------------|----------------------------------------------------------------------------------|
| Internal consistency     | + Factorial analyses performed on adequate sample size (7 participants per item or > 100 participants in total) and Cronbach’s alpha(s) calculated per dimension in a sample size of at least 50 patients and Cronbach’s alpha(s) between 0.70 and 0.95; |
|                          | ? No factor analysis or doubtful design or method;                               |
|                          | - Cronbach’s alpha(s) < 0.70 or > 0.95, despite adequate design and method;      |
|                          | 0 No information on internal consistency.                                         |
| Construct validity       | + 75% of the results agree with the specific hypotheses formulated;                |
|                          | ? Doubtful design or method (no formulation of hypotheses);                      |
|                          | - < 75% of the hypotheses were confirmed, despite adequate design and method;     |
|                          | 0 No information on construct validity.                                           |
| Reproducibility          | + MIC < SDC or MIC outside the LOA or convincing arguments in this criterion are acceptable; |
|                          | ? Doubtful design or method or no definition of MICs and unconvincing arguments that the criterion is acceptable; |
|                          | - MIC > SDC or MIC equal to or within LOA, despite adequate design and method;     |
|                          | 0 No information on agreement.                                                    |
| 3.1 Agreement            | + Moderate ICC or kappa > 0.70;                                                   |
|                          | ? Doubtful design or method (time interval not mentioned);                       |
|                          | - Moderate ICC or kappa of 0.70, despite adequate design and method;              |
|                          | 0 No information on reliability.                                                  |
| 3.2 Reliability          | + SDC or SDC < MIC or MIC outside the LOA or RR > 1.96 or AUC > 0.70;              |
|                          | ? Doubtful design or method;                                                      |
|                          | - SDC or SDC > MIC or MIC equal to or within LOA or RR < 1.96 or AUC < 0.70, despite adequate design and methods; |
|                          | 0 No information on response capability.                                           |
| Responsiveness           | + Less than 15% of responses achieved the highest or lowest score possible;        |
|                          | ? Doubtful design or method;                                                      |
|                          | - More than 15% of respondents achieved the highest or lowest possible score, although the design and methods are adequate; |
|                          | 0 No information on ceiling and floor effects.                                     |
| Floor and ceiling effects|                                                                                   |
|                          |                                                                                   |

MIC = Minimal important change; SDC = smallest detectable change; LOA = limits of agreement; ICC = intraclass correlation coefficient; SD = standard deviation.

+ Positive rating; ? Indeterminate rating; - Negative rating; 0 = no information available.

Doubtful design or methods = lacking a clear description of the study design or methods, sample size less than 50 individuals (at least 50 in each analysis, subgroup, or any major methodological weakness in the study design or execution).

3. Results

A total of 6,877 studies were selected during the search in the MEDLINE, EMBASE, CINAHL, and SCIELO databases. Of these, 176 studies were duplicates. After reading the titles and abstracts, 17 studies were selected for reading in full, of which only three (Fig. 1) carried out the translation and cross-cultural adaptation of the FACT-BMT questionnaire [1] and provided information on the evaluation of the measurement properties of this questionnaire. The studies found were published between 2002 and 2018.

A manual search was also performed that yielded one study in Japanese, and although this study was eligible, it had to be excluded because it was not possible to read the full text. Contact with the author was attempted through email, without a response.

3.1 Statistical Analysis

The demographic and clinical characteristics of the versions of the FACT-BMT questionnaire are listed in Table 3.

Table 4 shows the four selected studies that carried out the translation and cross-cultural adaptation of the FACT-BMT [1] questionnaire on quality of life after bone marrow transplantation into Chinese [20], Korean [21], Brazilian Portuguese [22] and Arabic [23] published in the years of 2002, 2006, and 2007, 2018.
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**Table 3** Demographic and clinical characteristics of the versions of the FACT-BMT questionnaire [20-23].

| Author          | Year of publication | Objective                                                                 | Population                                                                                          | Socio-demographic characteristics                                                                 |
|-----------------|---------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Lau et al. [20] | 2002                | To evaluate the psychometric properties of the traditional Chinese translation (TCHI) of the FACT-BMT Version 4.  
To translate and cross culturally adapt the FACT-BMT scale Version 4. | 134 BMT patients in Hong Kong. The diagnoses in the study sample were mixed, and included acute leukaemia (n = 52), chronic leukaemia (n = 47), lymphoma (n = 19), and others (n = 16) | The median time since BMT was 4.0 years, with a range from 1.1 to 9.8 years. Of the patients, 69.4% were aged between 31 and 50. Of these, 60.5% had been educated to secondary school level, and 21.6% had reached tertiary level or above; 62.7% had no religious background. |
| Yoo et al. [21] | 2006                | To translate and cross culturally adapt the FACT-BMT scale Version 4.       | 70 allogeneic BMT patients                                                                             | 34 males (48.5%) and 36 females (51.4%) with a median age of 20-29 years old.                     |
| Mastropietro et al. [22] | 2007     | To translate into Portuguese and validate the FACT-BMT quality-of-life questionnaire, among bone marrow transplantation patients. | 55 consecutive leukemia patients                                                                  | The patients’ mean age was 34.8 ± 8.1 years and mean schooling was 10.8 ± 4.7 years, and 78.1% of the patients were female. The mean time since transplantation was 29.8 ±3 2.19 months. |
| Soudy et al. [23] | 2018               | To translate and validate FACT-BMT (Version 4) in Arabic and report QoL.  | 108 lymphoma patients                                                                                 | 68 males (63%) and 40 females (37%) with a median age of 29 years (range 14-62).                  |

FACT-BMT = Functional Assessment of Cancer Therapy-Bone Marrow Transplantation; QoL = Quality of life; BMT = Bone Marrow Transplantation.
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Table 4 Evaluation of the versions of the FACT-BMT questionnaire, based on the guidelines for the translation and cross-cultural adaptation process [15, 17-19].

| Studies          | Year of publication | Language of the new versions | Translation | Synthesis of translation | Back translation | Expert committee review | Pre-test of the pre-final version |
|------------------|---------------------|------------------------------|-------------|--------------------------|-----------------|-------------------------|----------------------------------|
| Lau et al. [20]  | 2002                | Chinese                      | +           | +                        | +               | +                       | +                                |
| Yoo et al. [21]  | 2006                | Korean                       | ?           | 0                        | 0               | 0                       | +                                |
| Mastropietro et al. [22] | 2007          | Portuguese                   | +           | +                        | +               | +                       | +                                |
| Soudy et al. [23] | 2018               | Arabic                       | +           | +                        | +               | +                       | +                                |

Table 5 Evaluation of quality of life questionnaires after bone marrow transplant treatment, based on the measurement properties described by Terwee et al. [16-19].

| Studies          | Year of publication | Internal consistency | Construct validity | Reproducibility reliability | Reproducibility Agreement | Responsiveness | Ceiling and floor effects |
|------------------|---------------------|----------------------|--------------------|------------------------------|----------------------------|----------------|---------------------------|
| Lau et al. [20]  | 2002                | +                    | ?                  | -                            | 0                          | 0             | 0                         |
| Yoo et al. [21]  | 2006                | ?                    | ?                  | ?                            | 0                          | 0             | 0                         |
| Mastropietro et al. [22] | 2007          | ?                    | ?                  | +                            | 0                          | 0             | 0                         |
| Soudy et al. [23] | 2018               | +                    | ?                  | 0                            | 0                          | 0             | 0                         |

respectively. The Brazilian study [22] carried out the validation of version 3 [24] of the FACT-BMT [1], while the Chinese, Korean and Arabic studies validated version 4 [25] of the FACT-BMT [1].

An analysis of the new versions of the FACT-BMT [1] questionnaire showed that the questionnaires developed in Arabic, Brazilian Portuguese and Chinese followed all stages of the translation and cross-cultural adaptation process. Regarding the stages, the pre-test of the pre-final version was the most tested step. Only the Korean version did not present information on the process of translation synthesis, back translation, and review by expert committee and did not describe the translation process, making this stage doubtful.

Table 5 describes the evaluation of the measurement properties according to the guidelines followed [16]. None of the authors followed all the suggested criteria and did not evaluate reproducibility and agreement, responsiveness, and ceiling and floor effects. In the construct validity criterion, all four studies were doubtful as to their hypotheses. Regarding internal consistency, only the Korean and Arabic studies [21, 23] received a positive rating in their evaluation, with inter-relationship between the items of the questionnaire. Regarding reproducibility and reliability, the Korean study [21] did not achieve an adequate intra-class correlation coefficient (Kappa < 0.70). Only the Brazilian Portuguese version showed Kappa > 0.70 [22].

4. Discussion

The purpose of this study was to investigate the methodological quality related to the process of translation, cross-cultural adaptation, and clinimetric testing of the FACT-BMT questionnaire [1] that assesses the quality of life of patients submitted to bone marrow transplantation, following the guidelines proposed and updated by Beaton et al. [15] and Terwee et al. [16]. The cross-cultural adaptation questionnaire for use in a new country, culture, and/or language necessitates use of a unique method, to reach equivalence between the original source and target versions of the questionnaire, the items must not only be translated well linguistically, but also must be adapted culturally to maintain the content validity of the instrument at a conceptual level across different cultures. Attention to this level of detail allows increased confidence that the impact of a disease or its treatment is described in a similar manner in multinational trials or outcome evaluations [1]. The present review showed that there are methodological weaknesses in the validation of the FACT-BMT questionnaire [1] in other languages.

According to the FACIT quality-of-life assessment
system [26], the FACT-BMT [1] is available in 23 languages (Arabic, traditional Chinese, simplified Chinese, Danish, Dutch, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Lithuanian, Norwegian, Polish, Portuguese, Romanian, Russian, Spanish, Swedish, Thai, and Turkish), however, during our systematic search, only four studies were found. The authors of the Chinese and Arabic studies [20, 23] even mention that the FACT-BMT questionnaire [1] has been translated and validated into Spanish [27], Dutch [28], French [28], German [28], Italian [28], Norwegian [28], Swedish [28], Japanese [25], Portuguese [25], and Russian [25]. However, when we verified the references, they did not specifically identify validation studies of the FACT-BMT questionnaire [1], but of other questionnaires such as the FACT-G [24] and the FACIT [26].

Another difference found between the studies was that the Arabic, Korean and Chinese studies carried out the translation and cross-cultural adaptation of version 4 [25], that is, the most updated version of the questionnaire, while the Brazilian study used version 3 [24], the oldest version. The most updated version of FACT-BMT was published in 2002, so the Brazilian study [24] should have carried out the validation for the Portuguese language of the most updated version of the questionnaire. The Chinese study [20] also compared the alpha coefficient of version 3 (α = 0.88) to version 4, showing that the new version has a higher coefficient (α = 0.90).

Regarding the translation, the Arabic, Chinese and Brazilian Portuguese studies described the entire methodological process, leaving no doubt about the process. In contrast, the Korean study mentioned the translation process but did not provide detailed information on it, leaving doubt about the process. Furthermore, it did not provide information on the stages translation synthesis, back translation, and expert committee review. The only stage described in this study was the pre-test of the pre-final version [21].

The guidelines for translation and cross-cultural adaptation were published in 2000 [15], serving as a model for this process. Regarding the year of publication, all three studies were published after 2000, therefore after the guidelines had been published, showing that the Korean study did not follow all the guidelines available in the literature [15].

In relation to the measurement properties of the studies [20-23], the Brazilian study [22] evaluated the criterion construct validity as satisfactory and statistically significant but did not describe the item “hypothesis testing” in its methods, thereby contradicting itself. Regarding internal consistency, the validation to Brazilian Portuguese [22] and Korean [21] was doubtful because, despite an adequate Cronbach’s alpha between 0.70 and 0.95, the sample size was less than 100 patients. In the Chinese study [20], the internal consistency was positive with an adequate sample of 134 patients and Cronbach’s alpha > 0.78 and in the Arabic study the sample it was 108 patients with Cronbach’s alpha > 0.70 [23].

Regarding the Brazilian Portuguese version [22], the only criterion that was positive was reproducibility/reliability, with a significant correlation coefficient between 0.80 and 0.88. The Chinese study [20] did not provide the intraclass correlation coefficient, therefore it was classified as inadequate. The Korean study [21] did not explain in detail the method used to test the reliability, leaving doubts about its validation.

The study [16] used as a reference for evaluation of measurement properties was published in 2007, which may justify the methodological weaknesses in the evaluation of all the suggested criteria, as all three studies selected in this review were published before that date, therefore the Arabic study should have followed all the steps of validation of the properties of measures already consolidated in the literature. A limitation of the Brazilian study [22] was the educational level of the sample (23.6% of the patients), which required a second person to perform the
interview and fill in the questionnaire thus decreasing the methodological quality. In the Chinese study [20], however, the patients answered the questionnaire themselves without any help and all had secondary education or higher.

The present review was based on the guidelines of Beaton et al. [15] and Terwee et al. [16] to demonstrate the importance of evaluating the translation/cross-cultural adaptation and measurement properties of the FACT-BMT questionnaire [1] for its adequate use in clinical practice in other languages. However, the analysis of the studies showed a lack of methodological quality in the validation of the cross-cultural adaptation of this instrument. Therefore, high-quality studies are needed to adequately validate the FACT-BMT questionnaire [1] in other languages and ensure that the new versions are faithful to the original and can be applied consistently.

5. Conclusions

We conclude that the criteria used by the three studies found in our search to evaluate the translation/cross-cultural adaptation and the measurement properties of the FACT-BMT questionnaire [1] are methodologically weak and their reliability is doubtful. Moreover, this questionnaire is possibly being used in clinical practice without adequate validation in other languages and it may not be evaluating what it was designed to evaluate. Future studies are needed to adequately validate the measurement properties of the FACT-BMT questionnaire [1] in other languages.

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Evaluation of the Translation, Cross-cultural Adaptation and Properties of Measurement of the FACT-BMT Questionnaire

Appendix

Appendix 1: Search strategy in the databases.

| Medline |  |
|---|---|
| 1 | QuestionnaireS.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 2 | Questionnaire Design.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 3 | Design, QuestionnaireS.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 4 | Designs, Questionnaire.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 5 | Questionnaire Designs.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 6 | InstrumentS.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 7 | ScaleS.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 8 | Index.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 9 | Score.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 10 | Inventory.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 11 | Evaluat$.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 12 | Assess$.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 13 | Self Report.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 14 | Self-Report.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 15 | Report, Self.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 16 | Reports, Self.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 17 | Self-Reports.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 18 | Self-Reports.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 19 | Protocol.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 20 | 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 |
| 21 | QOL.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 22 | Karnofsky Performance Status.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 23 | Life Style.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 24 | Sickness Impact Profile.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 25 | Value of Life.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 26 | 21 or 22 or 23 or 24 or 25 or 26 or 27 |
|   |   |
|---|---|
| 29 | Oncology.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 30 | cancer.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 31 | Neoplasm, Benign.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 32 | Neoplasms, Benign.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 33 | Benign Neoplasms.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 34 | Stem Cell Transplantations.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 35 | Transplantations, Stem Cell.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 36 | Transplantation, Stem Cell.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 37 | Transplantation, Hematopoietic Stem Cell.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 38 | Stem Cell Transplantation, Hematopoietic.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 39 | Bone Marrow Transplantation.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 40 | Bone Marrow Purging.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 41 | Hematopoietic Stem Cell Mobilization.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 42 | Progenitor Cells, Hematopoietic.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 43 | Hematopoietic Progenitor Cells.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 44 | Cell, Hematopoietic Progenitor.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 45 | Cells, Hematopoietic Progenitor.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 46 | Hematopoietic Progenitor Cell.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 47 | Progenitor Cell, Hematopoietic.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 48 | Stem Cells, Hematopoietic.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 49 | Cell, Hematopoietic Stem.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 50 | Cells, Hematopoietic Stem.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 51 | Stem Cell Mobilization.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 52 | Mobilization, Stem Cell.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 53 | 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 |
| 54 | (animals not (humans and animals)).sh. |
| 55 | 53 not 54 |
| 56 | 20 and 28 and 55 |
| 57 | valid$.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 58 | translate$.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 59 | cross cultural$.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
### Evaluation of the Translation, Cross-cultural Adaptation and Properties of Measurement of the FACT-BMT Questionnaire

| 60 | cross-cultural$$.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 61 | cross cultural adapt$$.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 62 | cross-cultural adapt$$.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 63 | versions$$.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] |
| 64 | 57 or 58 or 59 or 60 or 61 or 62 or 63 |
| 65 | 56 and 64 |

| Embase |
|---|
| #1 | questionnaire* AND [embase]/lim |
| #2 | “questionnaire design” AND [embase]/lim |
| #3 | “design, questionnaire” AND [embase]/lim |
| #4 | “designs, questionnaire” AND [embase]/lim |
| #5 | “questionnaire designs” AND [embase]/lim |
| #6 | instrument* AND [embase]/lim |
| #7 | scale* AND [embase]/lim |
| #8 | index AND [embase]/lim |
| #9 | score AND [embase]/lim |
| #10 | inventory AND [embase]/lim |
| #11 | “evaluation”/exp AND [embase]/lim |
| #12 | “assessment” AND [embase]/lim |
| #13 | “self report”/exp AND [embase]/lim |
| #14 | “self-report”/exp AND [embase]/lim |
| #15 | “report, self” AND [embase]/lim |
| #16 | “reports, self” AND [embase]/lim |
| #17 | “self reports” AND [embase]/lim |
| #18 | “self-reports’ AND [embase]/lim |
| #19 | #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 |
| #20 | “quality of life”/exp AND [embase]/lim |
| #21 | “quality-of-life”/exp AND [embase]/lim |
| #22 | qol AND [embase]/lim |
| #23 | “karnofsky performance status”/exp AND [embase]/lim |
| #24 | “life style”/exp AND [embase]/lim |
| #25 | “sickness impact profile”/exp AND [embase]/lim |
| #26 | “value of life”/exp AND [embase]/lim |
| #27 | #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 |
| #28 | “oncology”/exp AND [humans]/lim AND [embase]/lim |
| #29 | “Stem Cell Transplantations” AND [humans]/lim AND [embase]/lim |
| #30 | “Transplantations, Stem Cell” AND [humans]/lim AND [embase]/lim |
| #31 | “Transplantation, Stem Cell” AND [humans]/lim AND [embase]/lim |
| #32 | “Transplantation, Hematopoietic Stem Cell” AND [humans]/lim AND [embase]/lim |
| #33 | “Stem Cell Transplantation, Hematopoietic” AND [humans]/lim AND [embase]/lim |
| #34 | “Bone Marrow Transplantation” AND [humans]/lim AND [embase]/lim |
| #35 | “Bone Marrow Purging” AND [humans]/lim AND [embase]/lim |
| #36 | “Hematopoietic Stem Cell Mobilization” AND [humans]/lim AND [embase]/lim |
| #37 | “Progenitor Cells, Hematopoietic” AND [humans]/lim AND [embase]/lim |
| #38 | “Hematopoietic Progenitor Cells” AND [humans]/lim AND [embase]/lim |
Evaluation of the Translation, Cross-cultural Adaptation and Properties of Measurement of the FACT-BMT Questionnaire

#39  Cell, Hematopoietic Progenitor AND [humans]/lim AND [embase]/lim
#40  “Cells, Hematopoietic Progenitor” AND [humans]/lim AND [embase]/lim
#41  “Hematopoietic Progenitor Cell” AND [humans]/lim AND [embase]/lim
#42  “Progenitor Cell, Hematopoietic” AND [humans]/lim AND [embase]/lim
#43  “Stem Cells, Hematopoietic” AND [humans]/lim AND [embase]/lim
#44  “Cell, Hematopoietic Stem” AND [humans]/lim AND [embase]/lim
#45  “Cells, Hematopoietic Stem” AND [humans]/lim AND [embase]/lim
#46  “Stem Cell Mobilization” AND [humans]/lim AND [embase]/lim
#47  “Mobilization, Stem Cell” AND [humans]/lim AND [embase]/lim
#48  “Benign Neoplasms” AND [humans]/lim AND [embase]/lim
#49  #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48
#50  translat* AND [embase]/lim
#51  valid* AND [embase]/lim
#52  “cross cultural” AND [humans]/lim AND [embase]/lim
#53  “cross cultural adaptation” AND [embase]/lim
#54  version AND [embase]/lim
#55  “cross-cultural adaptation” AND [embase]/lim
#56  #50 OR #51 OR #52 OR #53 OR #54 OR #55
#57  #19 AND #27 AND #49 AND #56

Cinahl
S1  Questionnair*
S2  “Questionnaire Design”
S3  Design, Questionnaire
S4  Designs, Questionnaire
S5  Questionnaire Designs
S6  Instrument*
S7  Scale*
S8  Index
S9  Score
S10  Inventory
S11  Evaluat*
S12  Assess*
S13  Self Report
S14  Self-Report
S15  Report, Self
S16  Reports, Self
S17  Self Reports
S18  Self-Reports
S19  S1 or S2 or S3 or S4 or S5 or S6 or S7 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16 or S17 or S18
S20  Quality of life
S21  Quality-of-life
S22  QOL
S23  Karnofsky Performance Status
S24  Life Style
S25  Sickness Impact Profile
S26  Value of Life
S27  S20 or S21 or S22 or S23 or S24 or S25 or S26
S28  Oncology
| S29 | Stem Cell Transplantations          |
|-----|-----------------------------------|
| S30 | Transplantations, Stem Cell       |
| S31 | Transplantation, Stem Cell        |
| S32 | Transplantation, Hematopoietic Stem Cell |
| S33 | Stem Cell Transplantation, Hematopoietic |
| S34 | Bone Marrow Transplantation       |
| S35 | Bone Marrow Purging               |
| S36 | Hematopoietic Stem Cell Mobilization |
| S37 | Progenitor Cells, Hematopoietic   |
| S38 | Hematopoietic Progenitor Cells    |
| S39 | Hematopoietic Progenitor Cells    |
| S40 | Cells, Hematopoietic Progenitor   |
| S41 | Hematopoietic Progenitor Cell     |
| S42 | Progenitor Cell, Hematopoietic    |
| S43 | Stem Cells, Hematopoietic         |
| S44 | Cell, Hematopoietic Stem          |
| S45 | Cell, Hematopoietic Stem          |
| S46 | Stem Cell Mobilization            |
| S47 | Cells, Hematopoietic Stem         |
| S48 | Benign Neoplasms                  |
| S49 | Transplantation, BoneMarrow       |
| S50 | HematopoieticStemCellTransplantation |
| S51 | Grafting, BoneMarrow              |
| S52 | BoneMarrowGrafting                |
| S53 | BoneMarrowCellTransplantation     |
| S54 | S28 or S29 or S30 or S31 or S32 or S33 or S34 or S35 or S36 or S37 or S38 or S39 or S40 or S41 or S42 or S43 or S44 or S45 or S46 or S47 or S48 or S49 or S50 or S51 or S52 or S53 |
| S55 | S19 and S27 and S54               |
| S56 | valid*                            |
| S57 | translat*                         |
| S58 | cross cultural                    |
| S59 | cross-cultural                    |
| S60 | cross cultural adapt*             |
| S61 | cross-cultural adapt*             |
| S62 | version                           |
| S63 | S56 or S57 or S58 or S59 or S60 or S61 or S62 |
| S64 | S55 and S63                       |

SCIELO

1 Qualidade de vida AND FACT-BMT AND questionário