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## Original article

# Translation and cross-cultural adaptation of FFI to Brazilian Portuguese version: FFI – Brazil<sup>☆</sup>



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### ABSTRACT

**Objective:** Perform the translation and cultural adaptation of the questionnaire Foot Functional Index (FFI), which assesses the functionality of the foot, to the Brazilian Portuguese version.

**Method:** The Brazilian version development of FFI questionnaire was based on the guideline proposed by Guillemin. The applied process consisted of: (1) translation; (2) back-translation; (3) committee review; (4) pretesting. The Portuguese version was applied to 40 patients, both genders, aged over 18 years old, with plantar fasciitis and metatarsalgia to verify the level of the instrument comprehension. The final Brazilian version of the FFI was set after getting less than 15% of “not understanding” on each item.

**Results:** Some terms and expressions were changed to obtain cultural equivalence for FFI. The terms that were incomprehensible were changed in accordance of patient suggestions. **Conclusion:** After the translation and cultural adaptation of the questionnaire, the final Portuguese version of FFI was concluded.

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## Tradução e adaptação cultural do Foot Function Index para a língua portuguesa: FFI – Brasil

### RESUMO

**Objetivo:** Fazer a tradução e a adaptação cultural do questionário Foot Functional Index (FFI), que avalia a funcionalidade do pé, para a versão em língua portuguesa do Brasil.

**Métodos:** A versão brasileira do FFI foi baseada no protocolo proposto por Guillemin.<sup>8</sup> O processo aplicado consistiu em: (1) tradução; (2) retrotradução; (3) análise do comitê de especialistas; (4) pré-teste. A versão brasileira foi aplicada em 40 pessoas, homens e

#### Palavras-chave:

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Pé

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mulheres com idade superior a 18 anos, com fasciíte plantar e metatarsalgia, para verificar o nível de compreensão do instrumento. A versão final foi definida após se obter menos de 15% de “não compreensão” em cada item.

**Resultados:** Foram alterados termos e expressões para obter equivalência cultural do FFI. As alterações feitas foram baseadas nas sugestões dos pacientes.

**Conclusão:** Após a tradução e adaptação cultural do questionário, foi concluída a versão da língua portuguesa do Brasil do FFI.

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## Introduction

In recent years there have been changes in the approach of musculoskeletal disorders. In the past, clinical changes were assessed by physical examination and laboratory tests. Currently, outcomes such as functionality have been emphasized as they allow for an analysis of the health situation, the impact of diseases on patient's life, and provide the necessary information to evaluate the effectiveness of different treatments.

Thus, evaluation measures that measure functional, social and emotional aspects have been proposed, which can be used both in clinical practice and in research.<sup>1-4</sup>

In order to apply health evaluation measures, developed and used in another language, a cross-cultural equivalence is necessary. This process consists on the translation, cultural adaptation and evaluation of the psychometric properties of the instrument. The translation and cultural adaptation phase allows the adjustment of the instrument to the new language, population, environment and culture. Psychometric properties assessment phases (validity, reproducibility and sensitivity to changes) consists on checking whether the new version retained the features of the original design.<sup>5-9</sup>

Musculoskeletal injuries in distal lower limbs causes several complications such as functional limitations and impaired quality of life. Approximately 4% of the world population between 25 and 74 years are likely to develop diseases in the ankle and foot.<sup>2</sup> Therefore, instruments have been proposed to assess the impact on quality of life and effectiveness of different treatments.<sup>1</sup>

Evaluation instruments of ankle and foot disorders are mainly available in English language. Among them, the FFI (*Foot Function Index*), AOFAS (*American Orthopaedic Foot and Ankle Society*), FAOS (*Foot and Ankle Outcome Score*), WOMAC (*Western Ontario and McMaster Universities Osteoarthritis Index*), LFIS (*Leeds Foot Impact Scale*) and MFPDQ (*Manchester Foot Pain and Disability Questionnaire*).

FFI (*Foot Function Index*) is a questionnaire developed in English to evaluate foot function in patients who have musculoskeletal injuries. Since evaluation is focused on the foot, the questionnaire has greater accuracy and sensitivity for identifying changes in this area, when compared to other available instruments.<sup>2</sup> In assessing the reproducibility of the original FFI, the intraclass correlation coefficient was considered excellent.<sup>2</sup>

FFI translations and validations have already been done into Chinese,<sup>4</sup> German,<sup>5</sup> French<sup>6</sup> and Italian.<sup>7</sup> This study aimed

at translating and making the cultural adaptation of the FFI questionnaire to Brazilian Portuguese.

## Materials and methods

### Participants

Forty patients participated in the study, with clinical diagnosis of plantar fasciitis and metatarsalgia. The mean age was 33 years and 78% were female. Regarding the level of education, 42% had not completed tertiary education, 32% completed tertiary education, 24% completed secondary education, and 2% did not complete secondary education.

The study was approved by the Research Ethics Committee n. 226.521 and an authorization from the author of the FFI was obtained via electronic mail for its use.

### Procedures

The Brazilian version of FFI was obtained according to the guideline proposed by Guillemin<sup>8</sup> (Fig. 1).

FFI was initially translated by two independent translators who had Portuguese as a native language. Thus two independent versions, V1 and V2, were obtained. Then, the two translations were compared and discussed by the translators and members of the committee consisting of three physiotherapists specialized in traumatology and orthopedics, and an orthopedist specialized on ankle and foot research. This meeting resulted in a consensus version, V3, which maintained the fundamental characteristics of the original questionnaire.

V3 version was translated back into English by two native English-speaking translators, forming two independent versions (V4 and V5), and the translators did not have access to the original questionnaire. Then, the members of the committee met again, to discuss the differences between versions (V1, V2, V3, V4 and V5) and the original questionnaire. Sentences that required modifications had been rewritten in order to improve the semantic, idiomatic, cultural and conceptual equivalence, and the V6 version was obtained.

The V6 questionnaire was administered to 40 patients with clinical diagnosis of plantar fasciitis and metatarsalgia. Initially, the questionnaire was administered to 20 patients to check understanding and acceptability of questions and answers. This phase was called the first phase of the Cognitive Interviews.

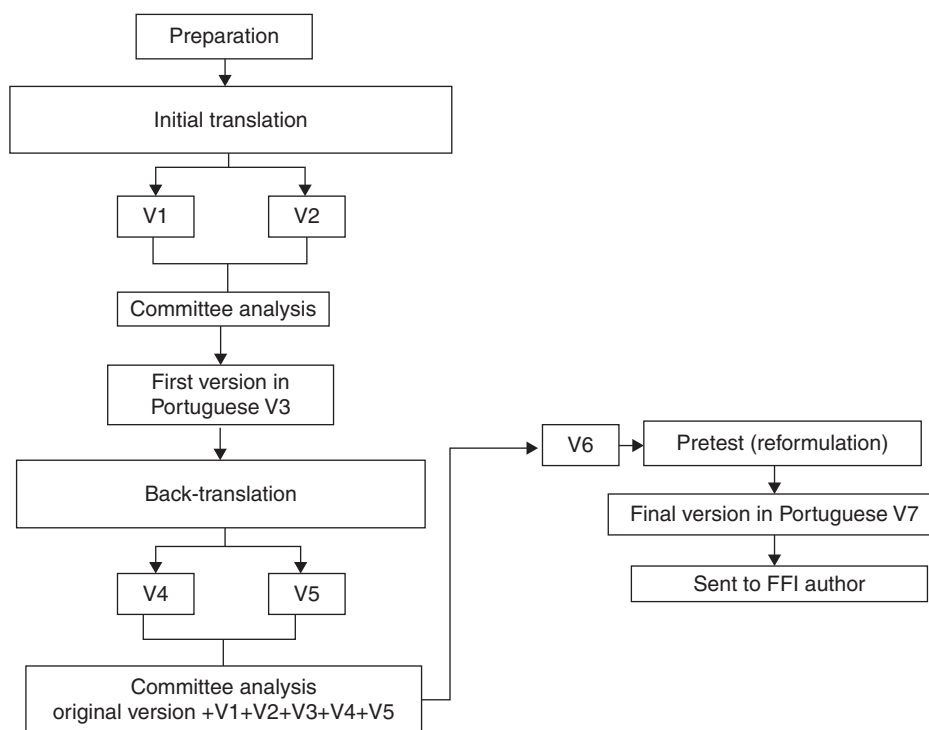


Fig. 1 – Study flowchart.

Each item of the questionnaire was read aloud for the participants, who had to: (1) answer if they understood (yes or no); (2) comment what they understood of each item read; and (3) suggest changes if there were any items that were “not understood”. According to the results of this stage, some terms had been adapted and modified. After this step, the questionnaire was administered to 20 patients in a second phase of Cognitive Interviews to refine clarity and understanding of the instrument, and items with more than 15% of “no understanding” were reformulated by the committee.

Again, this version was analyzed by the committee and sent to the author of FFI for approval, resulting in the final version V7 (Fig. 2).

### Score calculation

For the total score of each domain, the following formula was applied: sum of the score obtained from all items answered by the patient/total score possible of the domain x 100, in order to get the value in percent. If the patient does not perform an activity mentioned in one of the items (e.g. no use of assistive devices), this is considered not applicable. Thus, the score of these items are not considered in the total sum of that domain.

The final percentage of all domains shall be summed and divided by three (total number of domains) thus obtaining the final result of the questionnaire. The results may vary from 0 to 100% and are directly proportional to the limb functional impairment, and the higher the percentage, the greater the functional change presented by the patient.<sup>2</sup>

## Results

At the translation phase, some changes took place during the committee meeting, when all items of V1 and V2 versions were discussed for the formulation of consensus version V3 (Table 1).

After back-translation the committee met again to discuss the differences between all versions (V1, V2, V3, V4 and V5) and the original questionnaire. At this stage, changes were made in grammatical structures of some items for equivalence of words, languages, and adaptation of cultural context (Table 2).

Regarding the pre-test, the items “not understood” and changed during the phases of cognitive interview are included in Table 3.

In the first phase of the Cognitive Interviews two items of the FFI questionnaire, the numerical scale of 10 scores and item C1 in the worst pain crisis were reformulated, due to “no understanding” by more than 15% of patients. In the second stage of cognitive examination, patients did not show difficulties in understanding the items. So there was no changes.

With the pre-test performed and the necessary changes made, the final version of Portuguese FFI was defined (V7). This version was sent to the author of the original version of FFI, who did not suggest any changes.

## Discussion

The process of translation and cultural adaptation of FFI to the Portuguese language was performed and the Brazilian Portuguese version was obtained.

Nome: \_\_\_\_\_ Identificação do paciente: \_\_\_\_\_ Data: \_\_\_\_\_

Patologia do pé: \_\_\_\_\_ Idade: \_\_\_\_\_ Nível de escolaridade: \_\_\_\_\_

Escala numérica de dor: 0 1 2 3 4 5 6 7 8 9 10

Dor no pé e índice de incapacidade:

Incapacidade

Pontuação

A escala numérica de cada item abaixo representa com que frequência você fez cada atividade na última semana. A extremidade esquerda dos números representa nunca e a direita sempre. Faça uma marca no número que indica com que frequência você conseguiu realizar as atividades na última semana por causa de seus pés. Caso você não tenha realizado a atividade na última semana marque NA (não se aplica) à extrema direita do item.

Exemplo: Por quanto tempo você:

0. Anada pela casa de sapatos: Nunca 0 1 2 3 4 5 6 7 8 9 Sempre / \_\_\_\_\_

A. Por quanto tempo você:

Pontuação/

NA

1. Usa bengala, muletas ou andador dentro de casa? Nunca 0 1 2 3 4 5 6 7 8 9 Sempre / \_\_\_\_\_

2. Usa bengala, muletas ou andador fora de casa? Nunca 0 1 2 3 4 5 6 7 8 9 Sempre / \_\_\_\_\_

3. Fica em casa a maior parte do dia devido a problemas no pé? Nunca 0 1 2 3 4 5 6 7 8 9 Sempre / \_\_\_\_\_

4. Fica na cama a maior parte do dia devido a problemas no pé? Nunca 0 1 2 3 4 5 6 7 8 9 Sempre / \_\_\_\_\_

5. Limita suas atividades devido a problemas no pé? Nunca 0 1 2 3 4 5 6 7 8 9 Sempre / \_\_\_\_\_

Total \_\_\_\_\_ / Possível \_\_\_\_\_ = \_\_\_\_\_ %

**Fig. 2 – Brazilian version of FFI questionnaire.**

Dificuldade

Pontuação

A escala numérica de cada item abaixo representa quanta dificuldade você teve quando realizou estas atividades na última. A extremidade esquerda dos números representa nenhuma dificuldade e a direita tanta dificuldade que não foi possível realizar. Faça uma marca no número que indica a dificuldade que você teve para realizar as atividades na última semana por causa de seus pés. Caso você não tenha realizado a atividade na última semana marque NA (não se aplica) à extrema direita do item.

B. Quanta dificuldade você teve para:		Pontuação/											NA
1. Andar pela casa?	Nenuma dificuldade	0	1	2	3	4	5	6	7	8	9	Muita dificuldade/ Impossível	_____
2. Andar fora de casa no solo irregular?	Nenuma dificuldade	0	1	2	3	4	5	6	7	8	9	Muita dificuldade/ Impossível	_____
3. Andar quarto quarteirões ou mais?	Nenuma dificuldade	0	1	2	3	4	5	6	7	8	9	Muita dificuldade/ Impossível	_____
4. Subir escadas?	Nenuma dificuldade	0	1	2	3	4	5	6	7	8	9	Muita dificuldade/ Impossível	_____
5. Descer escadas?	Nenuma dificuldade	0	1	2	3	4	5	6	7	8	9	Muita dificuldade/ Impossível	_____
6. Ficar na ponta dos pés?	Nenuma dificuldade	0	1	2	3	4	5	6	7	8	9	Muita dificuldade/ Impossível	_____
7. Levantar da cadeira?	Nenuma dificuldade	0	1	2	3	4	5	6	7	8	9	Muita dificuldade/ Impossível	_____
8. Subir ou descer calçadas?	Nenuma dificuldade	0	1	2	3	4	5	6	7	8	9	Muita dificuldade/ Impossível	_____
9. Andar rápida ou correr?	Nenuma dificuldade	0	1	2	3	4	5	6	7	8	9	Muita dificuldade/ Impossível	_____
		Total _____/Possível _____ = _____%											

**Fig. 2 - (Continued)**

Dor

Pontuação

A escala numérica de cada item abaixo representa o nível de dor que você sentiu em cada situação. A extremidade esquerda dos números representa sem dor e a direita a pior dor imaginável. Faça uma marca no número que indica a intensidade da dor nos seus pés quando realizou essas atividades na última semana. Caso você tenha realizado a atividade na última semana marque NA (não se aplica) à extrema direita do item.

B. Quanta dificuldade você teve para:	Pontuação/										NA		
1. Na pior crise de dor?	Sem dir	0	1	2	3	4	5	6	7	8	9	A pior dor imaginável	_____
2. Antes de se levantar pela manhã?	Sem dir	0	1	2	3	4	5	6	7	8	9	A pior dor imaginável	_____
3. Quando anda descalço?	Sem dir	0	1	2	3	4	5	6	7	8	9	A pior dor imaginável	_____
4. Quando fica em pé descalço?	Sem dir	0	1	2	3	4	5	6	7	8	9	A pior dor imaginável	_____
5. Quando anda calçado?	Sem dir	0	1	2	3	4	5	6	7	8	9	A pior dor imaginável	_____
6. Quando fica em pé calçado?	Sem dir	0	1	2	3	4	5	6	7	8	9	A pior dor imaginável	_____
7. Quando anda usando aparelho ortopédico?	Sem dir	0	1	2	3	4	5	6	7	8	9	A pior dor imaginável	_____
8. Quando fica em pé usando aparelho ortopédico?	Sem dir	0	1	2	3	4	5	6	7	8	9	A pior dor imaginável	_____
9. Ao final do dia?	Sem dir	0	1	2	3	4	5	6	7	8	9	A pior dor imaginável	_____

Total \_\_\_\_\_/Possível \_\_\_\_\_ = \_\_\_\_\_%

**Fig. 2 – (Continued).**

**Table 1 – Modification on the initial phase of translation.**

Questionnaire Item	V1 and V2	Modification for consensual version V3
A. Foot pain and disability index	V1 Índice de dor no pé e incapacidade V2 Dor no pé e índice de imobilidade	Dor no pé e índice de incapacidade
A. None of time	V1 Nenhuma parte do tempo V2 Nunca	Nunca
A. Disability	V1 Imobilidade V2 Incapacidade	Incapacidade
A3. Stay	V1 Fica V2 Permanece	Fica
B2. Uneven ground	V1 Piso irregular V2 Solo irregular	Solo irregular
B9. Walk fast	V1 Andar depressa V2 Andar rápido	Andar rápido
C1. At its worst	V1 Quando dói mais V2 Na pior das hipóteses	Na pior dor
C5. Wearing shoes	V1 Calçando sapatos V2 Usando sapatos	Calçado
C7. Wearing orthotics	V1 Usando aparelho ortopédico V2 Usando palmilha ortopédica	Usando aparelho ortopédico
C. Worst pain imaginable	V1 A pior dor imaginável V2 Pior dor que sentiu	A pior dor imaginável

V1, version in Portuguese by the first translator; V2, version in Portuguese by the second translator; V3, consensual version in Portuguese defined at the end of the initial phase of translation.

**Table 2 – Phase of back-translation. Modifications in “V4” and “V5” for definition of “V6”.**

V4 and V5. Questionnaire Item - Term	V6. Questionnaire Item - Term
B8. V4 Subir ou descer na calçada? V5 Subir ou descer calçadas?	B8. Subir ou descer calçadas?
C1. V4 Quando dói mais? V5 Quando dói mais?	C1. Na pior dor?
C5. V4 Quando anda com calçado? V5 Quando você anda com calçado?	C5. Quando anda calçado?
C6: V4 Quando você está parada em pé com calçado? V5 Quando você está em pé com calçado?	C6. Quando fica em pé calçado?

V4 and V5, versions in Portuguese of the back-translation phase; V6, version defined in Portuguese after analysis of all translated versions and original version of the questionnaire.

The procedure of translation and cultural adaptation of instruments proposed by Guillemin<sup>8</sup> has been followed and cited in several studies, due to international recognition criteria. There are several questionnaires already translated and validated in the literature that followed this procedure, as WOMAC (Western Ontario and McMaster Universities)<sup>9</sup> and FAOS (Foot and Ankle Outcome Score).<sup>10</sup> Thus, the same procedure was followed for the FFI questionnaire.

In the initial phase of FFI translation into Portuguese, some expressions were changed by the committee. Among them, the question A. (“Disability”) was the most distinct expression among translators, in which one of the translators interpreted as immobility (*Imobilidade*) and the other as lack of capacity (*Incapacidade*). At consensus, the committee decided that the most appropriate term would be *Incapacidade*. In back-translation, the questions that were most discussed with the

**Table 3 – Pretest: cognitive interviews.**

Not understood items	Patients (%)	Suggestions
<i>1st phase of the Cognitive Interviews (n = 20)</i>		
Visual Analog Scale	14 (70%)	Numerical Scale of 10 points
C1. At worst pain?	11 (55%)	C1. At worst pain crisis?
C7. When wear orthotics?	1 (5%)	C7. In case you wear orthotics, when you walk wearing orthotics?
<i>2nd phase of the Cognitive Interviews (n = 20)</i>		
No items “not understood”		No changes

Items with more than 15% of “no comprehension” in the first phase were reformulated for the second phase of the Cognitive Interviews.



committee members in order to reach a consensus were questions C1. “Quando doi mais (When is your pain more severe)?” and C5. “Quando anda com calçado (When you walk with shoes)?”, which were modified to “Na pior dor (At the worst pain)?” and “Quando anda calçado (When you walked wearing shoes)?”, respectively.

At pretest phase (Cognitive Interviews phase), changes in some items were suggested for the better understanding of the patients. The changes made in the first phase were related to the Visual Analog Scale (a line of 10 cm is arranged between the numbers of the two extremes 0 and 10) and the item C1. “At worst pain?”, which were suggested by more than 15% of patients, being modified to: interspersed Numerical Scales from 1 to 10 points and “Na pior crise de dor (At the worst pain crisis)?”. Item C7 “Quando anda usando aparelho ortopédico (When you walk wearing orthotics)?” was suggested to be changed by only 5% of patients, not reaching 15% to be rewritten. After the changes, there was no need to change anything in the second phase of Cognitive Interviews.

In the present study, plantar fasciitis and metatarsalgia were selected because they are chronic diseases that affect mostly the feet. As they affect mainly women, this gender prevailed in the study. All applications of FFI were conducted through interviews, based on previous studies with the same purpose.<sup>9,10</sup>

Although there are methodological variations of the process of translation and cultural adaptation of questionnaires about quality of life and functionality, the standard process must be maintained, including the phases of translation, back translation and cultural adaptation.<sup>11-13</sup> The Brazilian version of FFI is in process of psychometrics properties evaluation. After the end of the process it will be available for use in Brazil.

## Conclusion

The process of translation and cultural adaptation of the FFI was carried out and the version to Brazilian Portuguese was obtained.

## Conflicts of interest

The authors declare no conflicts of interest.

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