



Translation, adaptation and validation of Frail Non-Disabled Questionnaire to the Brazilian context

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Abstract

Objective: To translate, adapt and validate the Frail Non-Disabled Questionnaire (FiND) for the Brazilian context. **Method:** The steps recommended by the international literature for health instruments were followed: initial translation, synthesis of translations, back-translation, review by a committee of experts, pre-test, and assessment of the scale's psychometric properties. All ethical precepts were followed. **Results:** The translation and back-translation were performed by two independent and qualified translators. The expert review demonstrated its content validity. In the pre-test, FiND was easy to understand and apply. In the assessment of psychometric properties, the instrument demonstrated good values of reliability and reproducibility. Concurrent criterion validity was verified, finding a positive correlation with statistical significance between the FiND score and Fried's Frailty Phenotype and good values of sensitivity, specificity, positive and negative predictive values, and accuracy. The convergent construct validity was analyzed, indicating a positive correlation between the FiND score and depressive symptoms, and negative correlations with nutritional and cognitive status, and with the domains of the physical component of quality of life, with statistical significance. Discriminant validity was analyzed by comparing FiND means between the robust, non-frail, and fragile groups, with and without depressive symptoms, with a better and worse perception of quality of life, and with adequate nutritional status, at risk of malnutrition and with a state of malnutrition, which proved to be statistically significant. **Conclusion:** FiND has been translated, adapted, and validated for the Brazilian context.

Keywords: Translating. Validation Study. Frailty. Elderly. Questionnaire.

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INTRODUCTION

Population aging is recognized as a dynamic, progressive and irreversible process¹. As a result of the rapid decline in physical and mental functions of older people, there is an increase in the burden on health and social care systems worldwide, and preventive actions against the functional deterioration of the older people population should be prioritized². In this context, multidimensional assessment focusing on geriatric syndromes becomes necessary, paying attention to their identification and their treatment, producing better results for older people care, as they are mainly responsible for the loss of autonomy and independence of the older people³.

Frailty is defined as a syndrome, which is characterized by a decrease in energy and is related to physiological changes in systems: musculoskeletal, neuroendocrine and immunological. Therefore, triggering a reduction in muscle mass, appetite disorders and chronic inflammation⁴. The identification of frailty is essential for the implementation of multidimensional preventive interventions, which will favor a better quality of life⁵.

Several instruments have been developed over the years to identify frailty in older patients⁶. However, the screening tools available in the literature have two main limitations: few are valid for self-administration and few allow us to differentiate fragility from disability – a broad term to indicate disabilities, limitations in the performance of activities and restrictions on social participation, associated with health states⁵.

In this context, Cesari et al.⁴ developed the *Frail Non-Disabled Questionnaire* (FiND) instrument in France, which is self-administered, composed of five items and follows the main multidimensional construction of the frailty phenotype, widely adopted as proposed by Fried et al.⁵.

Not only, the instrument also addresses a specific section to exclude the presence of mobility impairment, which is considered the initial phase of the incapacitation process, and can represent an opportunity to spread awareness about frailty and disability in older people⁵.

Given the above, making FiND available for wide use in Brazil is relevant and essential. Furthermore, so far, no instruments have been found that allow for the differentiation between incapable and frail older people in the Brazilian literature. Thus, the present work intends to carry out the translation, cultural adaptation and validation of the *Frail Non-Disabled Questionnaire* (FiND) for the Brazilian context.

METHOD

This is a methodological study of translation, cultural adaptation and validation of the *Frail Non-Disabled Questionnaire* (FiND)⁵ instrument for the Brazilian context. For the process of translation, adaptation and validation of FiND, the steps recommended in the literature were followed sequentially⁷.

This process had seven phases, namely: initial translation; synthesis of translations; back translation; reviews by a committee of judges; pretest; presentation and evaluation of reports on the cultural adaptation process; evaluation of the instrument's psychometric properties, after its translation and cultural adaptation⁷.

Initially, the FiND instrument was submitted to translation from American English to Brazilian Portuguese by two qualified and bilingual translators, independently. Afterwards, the researchers and the translators defined a consensual version in Brazilian Portuguese of the FiND, evaluating the existing differences in the translations, considering the original version of the instrument.

Following the theoretical framework adopted, the consensual version in Brazilian Portuguese of FiND was reverted to American English by another qualified translator, with American English as the mother tongue, and with experience in translating texts in the health area. The translator did not know the objectives of the present study or the original version of the questionnaire used.

The back-translated version showed similarities with the original American English instrument. Thus, the Brazilian Portuguese consensual version

of the FiND and the back-translated version were evaluated by the committee of judges.

The expert committee was composed of five judges. The selection was based on the following requirements: fluency in the English language, training in the health area, experience in the subject of frailty in older people, as well as knowledge of the research methodology, that is, experience with translation and adaptation of instruments. Also, it is worth mentioning that the selection of the members participating in the expert committee took place by consulting the lattes platform (www.lattes.cnpq.br). They evaluated the semantic, idiomatic, experimental and conceptual equivalence of the consensual version of FiND, producing its pre-final version.

Afterwards, the pre-test was carried out. For this stage, 46 older people from the community who were assisted by the Family Health Units (USF) in a city in the interior of the state of São Paulo were selected. In this stage of evaluation of the FiND instrument, participants analyzed the clarity and understanding of all items that make up the FiND. Once the pre-test was carried out and the final version of the FiND was established, the last step related to the assessment of the instrument's psychometric properties was started, including the assessment of the instrument's reliability and validity.

The sample for the evaluation stage of the instrument's psychometric properties consisted of 234 older people assisted by the USF in a city in the interior of the state of São Paulo. Inclusion criteria were: being aged 60 years or over and being cared for by the city's USF. Exclusion criteria were: individuals who had severe reported deficit of vision or hearing; cognitive impairment tracked by the Addenbrooke Cognitive Examination - Revised Version (ACE-R)⁸ and people with functional limitations due to acute or chronic diseases that prevented the participant from performing part of the Fried Frailty Phenotype⁴ (hand grip test and walking test).

The instruments used in the assessment of psychometric properties, for the analysis of construct validity, were applied, in addition to FiND⁵, the Fried⁴ Frailty Phenotype, the ACE-R⁸, the Geriatric Depression Scale - short version (GDS-15)⁹, the Mini Nutritional Assessment (MNA)¹⁰ and the Short

Form - 36 (SF-36)¹¹. The instruments were applied through individual interviews, conducted by three properly trained graduate students.

The FiND was developed by Cesari et al.⁵ in English in France in 2014, it is composed of five items, the first two (A and B) being designed to identify patients with disabilities, while the last three (C, D and E) are intended for the assessment of signs, symptoms or conditions generally considered as components of the frailty syndrome⁵. Total score ranges from zero to 5 points. If the older patient scores on items A or B, they are considered incapable. If they do not score on items A and B, but score on C, D or E, they are considered fragile. Finally, if they do not score on any item, the older person is considered robust/not frail⁵.

Fried's Frailty Phenotype was developed by Fried et al.⁴ as an assessment for frailty syndrome. To this end, it consists of five criteria that assess the condition of frailty. The ACE-R is a useful tool in diagnosing dementia at an early stage. In order to facilitate its application and add new language questions, in Brazil, the revised version was translated and validated by Carvalho and Caramelli in 2007⁸, comprising questions that assess five cognitive domains.

The GDS-15 is often used to detect depressive symptoms in older patients. In Brazil, the 15-questions short version (GDS-15) was translated and validated by Almeida and Almeida in 1999⁹. The MNA was developed by Vellas et al.¹⁰ in 1999, and refers to a tool that provides a simple and quick method to identify older patients who are at risk of malnutrition or who are already malnourished. The SF-36, on the other hand, refers to a generic instrument for assessing quality of life, easy to administer and understand, which was translated and validated for the Brazilian context by Ciconelli et al.¹¹ in 1999.

For data analysis, descriptive analyzes and verification of data normality were performed using the Kolmogorov-Smirnov test.

To verify the content validity of the FiND, the Content Validity Index (CVI) was used to assess the experts' answers regarding each item present in the FiND. The judges' assessment instrument

consisted of a Likert-type response scale from 1 to 4 points, and for each item of the scale the specialist could consider the item: 1= not equivalent; 2= little equivalent; 3= equivalent; 4= very equivalent. For the interpretation of the CVI, the recommended value of 0.80 or more was adopted. The CVI score was calculated by the sum of agreement of the items that received scores of “3” and “4” by the experts, divided by the total number of responses.

For the analysis of the psychometric properties of the FiND, it was verified: the internal consistency of the instrument, through the Kuder-Richardson 20 (KR-20)¹²; the stability of the FiND score, through the Intraclass Correlation Coefficient¹³; the concurrent criterion validity of FiND, through Spearman's Correlation Coefficient, relating its score to Fried's Frailty Phenotype⁴, in which the magnitude of the correlations was classified according to the proposition of Levin and Fox¹⁴. Not only, to verify the validity of the concurrent criterion of the instrument, the sensitivity, specificity, accuracy and positive and negative predictive values were also analyzed, with respective 95% confidence intervals, in addition to the quantitative-qualitative linear relationship between the area under the ROC curve (AUC)¹⁵; the convergent construct validity of the FiND instrument, through Spearman's Correlation Coefficient, relating its score obtained with the scores of the physical component domains of the SF-36, ACE-R, MNA and GDS-15¹⁶.

In addition, the Kruskal-Wallis and Mann Whitney tests were performed to verify the discriminant validity of the FiND instrument, according to the level of frailty assessed by the Fried frailty phenotype (robust, non-frail and frail); the level of depressive symptoms (no depressive symptoms, with mild and severe depressive symptoms); the perception of quality of life (better and worse); nutritional status (malnutrition status, at risk of malnutrition and adequate nutritional status); and cognitive (with and without signs of cognitive impairment).

The significance level adopted was 5% ($p\text{-value}\leq 0.05$). This research was approved by the Ethics Committee with Human Beings of the Federal University of São Carlos (Opinion Number 1891428) and all ethical precepts set out

in Resolutions 466/12 and 510/2016 of the National Health Council were respected.

RESULTS

Following the steps developed in the research, two translated versions of FiND were obtained, in addition to a consensual version and a back-translated version to the original language.

The back-translated version showed similarities with the original American English instrument. Thus, the Brazilian Portuguese consensual version of the FiND and the back-translated version were evaluated by the committee of judges.

After the evaluation of the committee of judges, it was found that of the 21 items that make up the FiND, 14 presented values of CVI=1, being considered equivalent and kept in the pre-final version of the instrument. The other items were reanalyzed and modified by the researchers, as suggested by the experts. After the modifications, the pre-final version was resubmitted and approved by all judges. Subsequently, the pre-final version of the instrument was obtained and it was tested with 46 older people from the community who met the eligibility criteria. At this stage, the applied version was not changed, being judged to be clear, quick and easy to understand. Thus, no modifications were suggested.

Finally, in the last step of evaluating the psychometric properties of the instruments, the study included 234 older people. There was a predominance of female respondents (67.95%), white (73.93%) and married (59.40%). Regarding the education of the participants, there was a predominance of older people with 1 to 4 years of schooling (51.30%), followed by older people with more than 9 years of schooling (18.80%), with 5 to 8 years of schooling (17.94%) and with less predominance, illiterate older people were observed (11.96%). It was also found that there was a predominance of older people who were Catholics (70.51%), practitioners of any religion (64.22%), retirees or pensioners (79.49%), who lived in their own homes (91.45%), who used at least one medication continuously (88.89), and who had not suffered falls in the last 12 months (64.53).

Regarding the instrument's reliability, the value found for the KR-20 coefficient was 0.642; however, it was found that item C (3) had less consistency and when excluded, the value found was 0.705, considered satisfactory. However, this issue is of paramount importance for the instrument, as it is about weight loss, therefore, it was decided to leave it on the scale. Satisfactory stability was also observed, since the value found for the test-retest was $ICC=0.841$ (95% CI 0.718; 0.910).

The FiND showed satisfactory concurrent criterion validity when correlated with the instrument considered the gold standard for the assessment of physical frailty. There was a positive correlation, of strong magnitude and with statistical significance between FiND⁵ and Fried⁴ Frailty Phenotype ($r=0.603$; $p<0.001$).

Not only, it was verified satisfactory concurrent criterion validity of the FiND instrument through the analysis of the ROC curve. The ROC curve drawn for the scale is shown in Figure 1, the area under the ROC curve drawn for the score obtained in the FiND reached a satisfactory value of 0.855 (95% CI [0.793;0.917]; $p<0.001$).

The analysis of the values showed that the ideal FiND cutoff point for screening for frailty is 2.5, resulting in a sensitivity of 80.85% [95% CI (50.88; 97.06)] and specificity of 83.33% [95% CI (75.71; 94.51)]. The positive and negative predictive values for this cutoff were 55.88% [95% CI (33.45; 80.57)] and 94.34% [95% CI (85.67; 99.33)], respectively. The accuracy of the instrument was 86.96% [95% CI (76.18; 93.50)].

It can be seen in Table 1 that the FiND presented satisfactory convergent criterion validity when correlated with the scores of the ACE-R, GDS-15, MNA instruments, and the SF-36 physical component domains (Functional Capacity, Physical Aspects, Pain and General Health).

Table 2 shows that FiND had satisfactory discriminant construct validity, since the instrument was able to differentiate the groups according to the level of frailty (assessed by Fried's frailty phenotype), and the presence of depressive symptoms (assessed by GDS-15), perception of quality of life (assessed by SF-36), nutritional status (assessed by MNA) and cognitive status (assessed by ACE-R).

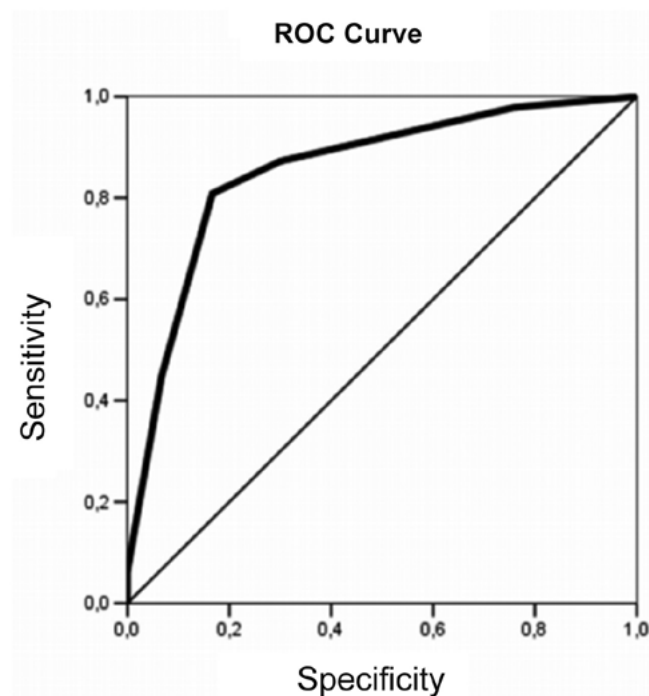


Figure 1. ROC curve for FiND, using Fried's Frailty Phenotype as the gold standard. São Carlos, 2018.

Table 1. Analysis of the convergent construct validity of the FiND instrument through the analysis of Spearman's Correlation Coefficient with the GDS-15, ACE-R, MNA and the SF-36 physical component domains. São Carlos, 2017-2018.

		Instruments						
		GDS-15	ACE-R	MNA	SF-36			
					FC	PA	Pain	GHS
FiND	r	0.465	-0.335	-0.436	-0.745	-0.421	-0.496	-0.482
	p	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*
	n	234	234	234	234	234	234	190

r: Spearman's correlation coefficient; p: p value; n: Sample size; * Statistically significant; FC: Functional Capacity; PA: Physical Aspects; GHS: General Health Status.

Table 2. Analysis of the discriminant construct validity of the Brazilian version of FiND. São Carlos, São Paulo, Brazil, 2017-2018.

Instrument / Categories	FiND		p value
	N	Mean ± SD *	
Fried's Frailty Phenotype			
Robust	49	0.59 ± 0.73	<0.001 ^{*,a}
Pre-Frail	131	1.56 ± 1.15	
Frail	48	3.19 ± 1.14	
MNA			
Malnutrition Status	6	4.33 ± 0.82	<0.001 ^{*,b}
At Risk of Malnutrition	28	2.93 ± 1.33	
Normal Nutritional Status	200	1.44 ± 1.21	
ACE-R			
With evidence of Cognitive Alteration	127	1.97 ± 1.47	0.002 ^{***}
Without evidence of Cognitive Alteration	107	1.36 ± 1.18	
GDS-15			
No Depressive Symptoms	157	1.29 ± 1.18	
Mild Depressive Symptoms	60	2.3 ± 1.41	<0.001 ^{*,c}
Severe Depressive Symptoms	16	3.25 ± 1.12	
SF-36			
Functional capacity			
Worst quality of life	119	2.51 ± 1.30	<0.001 ^{***}
Better quality of life	110	0.75 ± 0.68	
Functional Assessment			
Worst quality of life	60	2.62 ± 1.43	<0.001 ^{***}
Better quality of life	169	1.33 ± 1.18	
Pain			
Better quality of life	114	2.27 ± 1.39	<0.001 ^{***}
Worst quality of life	115	1.06 ± 1.05	
General Health Status			
Worst quality of life	118	2.24 ± 1.42	<0.001 ^{***}
Better quality of life	111	1.05 ± 1.02	

*SD=Standard Deviation; **Kruskal-Wallis test; ***Mann Whitney test; ^aStatistical differences between the robust and pre-frail, robust and frail, and frail and pre-frail groups; ^bStatistical differences between groups under malnutrition status and normal nutritional status, and at risk of malnutrition and normal nutritional status; ^cStatistical differences between the groups with no depressive symptoms and mild depressive symptoms, and with no depressive symptoms and severe depressive symptoms;

DISCUSSION

This study translated, adapted and validated the FiND for the Brazilian context, aiming to fill a gap in the area of healthcare for older people in Brazil. For the translation and adaptation processes, the steps recommended by the literature were followed, significantly contributing to the quality of the result obtained, indicating that the Portuguese version of the instrument is linguistically faithful to the questionnaire in its original language (English), and its adequacy confirmed by the evaluation of a committee composed of experts.

Several instruments are produced in one language and later translated into others, and the validation by experts stage is very important in these processes of translation and cultural and linguistic adaptation of scales and questionnaires¹⁷. According to Alexandre and Coluci¹⁸, the translation and adaptation of an instrument is a complex process due to the existence of cultural and language differences between the countries involved. Thus, the inadequate selection of measurement instruments of low methodological quality can be considered a bias in the conclusions of studies, and the standardization in the translation and adaptation of instruments is highly justified¹⁹.

The studied sample was described in terms of sociodemographic characteristics. There was a predominance of females, with low education (1 to 4 years), white and married, corroborating several other studies available in the national and international literature^{20–22}. It is still possible to verify that the literature shows us that being female and of advanced age can be predictors of frailty^{21,23,24}.

Regarding the instrument's psychometric properties, the homogeneity and reproducibility of the FiND were verified through the analysis of the instrument's internal consistency and its test-retest, and the results obtained were considered satisfactory. Several instruments available in the literature for the assessment of frailty presented satisfactory homogeneity and reproducibility, being used in large-scale studies. As an example, the *Frailty Index*, PRISMA-7, CHS Index and FRAIL instruments are cited^{4,24–26}.

Not only, there was satisfactory concurrent criterion validity of the FiND instrument, as it correlated positively and strongly with the instrument considered the gold standard for the assessment of physical frailty, and presented satisfactory results through the analysis of the ROC Curve, demonstrating satisfactory sensitivity, specificity, positive and negative predictive values and accuracy.

In the study of the original version of the instrument, data on the reliability of the scale were not reported. Regarding its validity, only data on its accuracy were found, through its specificity and capacity to identify non-incapable frail patients, corroborating the data found in the present study. In this context, the authors concluded that the FiND instrument showed good ability to correctly identify frail older people without disabilities living in the community⁴.

Still regarding the accuracy of the FiND instrument, Mirabelli et al.²⁷ used the instrument to assess frailty in clinical practice with patients with vascular diseases, and observed good sensitivity, but low specificity. Data on instrument reliability were not reported.

In the present study, satisfactory discriminant construct validity was also observed, since the FiND instrument was able to discriminate the older people groups according to the level of frailty, presence of depressive symptoms, perception of quality of life, nutritional and cognitive status, corroborating several studies that investigate the relationship between the studied variables^{28–32}.

Rossetti et al.²⁸ investigated the relationship between frailty and depressive symptoms and burden of caregivers of older people in a context of high social vulnerability, and observed a positive and moderate correlation between frailty and depressive symptoms, concluding that, as the frailty levels increased, depressive symptoms became more prevalent in the studied population. Not only, Ribeiro et al.²⁹ explored the relationship between depressive symptoms and frailty in 91 centenarians from two different regions of Portugal and observed that centenarians who were classified as frail had higher risks of depression compared to pre-frail

centenarians, concluding that depression is a frequent condition in frail older people.

Regarding the relationship between frailty and quality of life, Jesus et al.³⁰ assessed the level of frailty and its relationship with the perception of quality of life of older people registered in Social Assistance Reference Centers in a city in the interior of the state of São Paulo, Brazil and observed negative correlations and weak to moderate magnitude between frailty and quality of life, indicating that frail older people had a worse quality of life. In their systematic review study, Kojima et al.³¹ concluded that older patients classified as frail or pre-frail had significantly lower physical and mental quality of life than those classified as non-frail.

In order to investigate the relationship between frailty and nutritional parameters reported by adults residing in the United States and observed the relationship between nutritional parameters and frailty, which contribute to the increased risk of death³².

In order to analyze the relationship between cognition and frailty in older people, Brigola et al.²⁴ carried out a systematic review of the literature on the subject, analyzing 19 studies. As a result, all studies established a relationship between cognition and frailty, in which frailty components and cognitive domains were related. Furthermore, Hao et al.³² investigated the impact of frailty and cognitive impairment in 705 older people in the Chinese community and concluded that older people who had both conditions concomitantly were associated with an increased risk of death, with frailty and cognitive impairment being risk factors for death in older people.

Based on the above, the evidence of reliability and validity of the Brazilian version of FiND is confirmed, and this instrument is available for wide use in Brazil, considering that the identification and early screening of frailty, carried out through simple tools by professionals in the health area,

caregivers and family members are fundamental for the implementation of actions and favor the improvement of the quality of life of the population in the process of becoming frail.

In the present study, as limitations, the transversal cut stands out, which did not allow the verification of the responsiveness of the FiND instrument, therefore, it was not possible to verify its sensitivity for detecting changes. Not only that, it was not possible to find studies on the translation, adaptation and validation of the FiND instrument for other contexts, which made it difficult to compare the results obtained with other studies, limiting the discussion based on the results presented. In addition, it is worth mentioning that the FiND was developed based on Fried's frailty phenotype and it was adopted as a criterion to test concurrent validity, finally, the non-adoption of an instrument that specifically assesses disability, as was done in the original study of the instrument's elaboration.

CONCLUSION

Based on the proposed objectives and results obtained, it can be concluded that the FiND instrument is translated, adapted and validated for the Brazilian context (additional material). It demonstrated satisfactory psychometric properties (reliability, concurrent criterion, convergent and discriminant construct validity).

It is expected that this study will help, through the availability of the Brazilian version of FiND, in the screening of frailty in the Brazilian older people population, thus enabling the implementation of actions by health professionals, with the aim of reversing or even preventing this syndrome. It is also recommended that further studies be carried out in order to expand and confirm the psychometric properties of the Brazilian version of FiND in different populations and contexts.

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