Psychometric properties of the Revised Fibromyalgia Impact Questionnaire (FIQR) – a contribution to the Portuguese validation of the scale

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ABSTRACT

Background: Fibromyalgia (FM) remains a relatively misunderstood and clinically challenging condition that impact significantly in the individual's life, impairing global functioning and diminishing quality of life. Management is complex and frequently unsatisfactory, requiring personal tailoring and adaptation of interventions according to the fluctuations of the disease manifestations and their response to therapy. The use of comprehensive and quantified assessment tools constitutes, therefore, an essential component of the management of patients with FM. The Revised Fibromyalgia Impact Questionnaire (FIQR) is currently one of the most used and well validated instruments to assess functional (in)capacity and global impact of FM and associated symptoms.

Objectives: To translate to Portuguese the FIQR and to study its psychometric properties.

Material and Methods: The total sample comprised 103 women with fibromyalgia, defined according to the established criteria for FM. A self-report battery composed by the Revised Fibromyalgia Impact Questionnaire (FIQR), and the Portuguese versions of Beck Depression Inventory-II (BDI-II) and the Profile of Mood States (PoMS) was administered. The FIQR was re-administered to twenty-four participants, six weeks after the first evaluation. Internal reliability was assessed through Cronbach's alpha, corrected item-total score correlations and alpha if item deleted. Spearman and Pearson correlations along with repeated measures tests were computed to assess the temporal stability of the scale. Convergent and divergent validity were assessed via Spearman and Pearson correlations.

Results: The FIQR demonstrated a good to very good internal consistency (from $\alpha = 0.87$ to $\alpha = 0.94$). All items correlated to a good degree (above 0.30) to the total score and contributed significantly to the overall reliability. Moreover, FIQR presented a good temporal stability (from $r = .617$ to $r = .886$, $p \leq .001$) and favorable convergent and discriminant validity with depressive symptoms ($r > .289$, $p \leq .01$) and positive ($r > -.186$, $p > .05$) and negative affect ($r > .206$, $p \leq .05$).

Conclusions: The Portuguese version of the FIQR demonstrated good psychometric properties, which renders it a proper and valuable tool to be used in different settings.

Keywords: Fibromyalgia; Validity; Reliability; Portuguese; Revised Fibromyalgia Impact Questionnaire

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INTRODUCTION

Fibromyalgia (FM) is a chronic musculoskeletal syndrome characterized by widespread pain, usually accompanied by fatigue, stiffness, sleep disorders, cognitive dysfunctions, anxiety and depressed mood[1-3]. It affects 2-5% of the general population, mostly women, and has a strong negative impact upon quality of life[2,4,5].

FM diagnosis is based exclusively on clinical criteria, due to the current absence of biological or imaging markers[1]. The American College of Rheumatology (ACR) published classification criteria in 1990[4] and preliminary diagnostic criteria in 2010[6].

Patients with FM can present extremely variable clinical profiles according to the intensity and nature of pain, fatigue, sleep and mood disturbances among other features of the disease. The relative importance of individual features and the global impact of disease fluctuate over time[1]. These aspects impose the need for tailored treatment and timely adaptation of therapeutic interventions[7]. This flexible approach is best served by the regular use of instruments designed and validated to measure the impact of disease. Similar instruments are also indispensable in the evaluation of new interventions.

Fibromyalgia Impact Questionnaire (FIQ) is the most widely used tool in assessing functional capacity and impact in FM, being translated in 14 languages, including Portuguese from Portugal[8] and Brazil[9], both in 2006. First published in 1991[10] and with minor revisions in 1997 and 2002[11], FIQ is held as one of the most sensitive tools to assess FM course over time[12] and a key endpoint in clinical trials aimed at evaluating individual's responsiveness to different intervention models[11,13-15]. However, the FIQ has been criticized for ignoring several symptoms that are common in FM patients, such as tenderness, balance disturbance, environmental sensitivity and cognitive problems. Additional criticism was targeted at the consideration of activities that are not equally common or relevant in wealthy and poor countries (such as, driving a car or using a washer and dryer), male and female and the use of a rather cumbersome scoring algorithm[16]. In response, Bennett and coworkers proposed, in 2009, a revised version of FIQ, the Revised Fibromyalgia Impact Questionnaire (FIQR)[17].

FIQR addresses a wider range of symptoms than the original version, by including also tenderness to touch, memory disorders, postural balance, hyperalgesia or sensitivity to environmental factors. Some of the questions were reformulated in order to be suitable for both men and women of all socioeconomic levels. Such as in the original FIQ, all the questions regard the course of the past 7 days[17]. The authors demonstrated that the revised version of the questionnaire had, in their clinical and cultural setting, good psychometric properties ($\alpha = 0.95$), good convergent and discriminant validity) and strong associations with the original version of the scale, both on single domains and total score[17].

FIQR has been recently validated and translated into Brazilian Portuguese[18], Spanish[19], Turkish[20], Arabian Moroccan[21], Arabian Jordanian[22] and Persian[23].

FIQR is being increasingly used in practice and in research studies as an outcome variable to evaluate the effectiveness of different interventions[24-26]. It has also been employed to explore differences between patients with FM, patients with other disorders such as Rheumatoid Arthritis (RA) and Systemic Lupus Erythematosus (SLE) and healthy controls[27-29].

The aim of this paper was to translate the Revised – -Fibromyalgia Impact Questionnaire (FIQR) to Portuguese of Portugal and to evaluate its psychometric properties, specifically its internal consistency, temporal stability and convergent and discriminant validity.

MATERIAL AND METHODS

PARTICIPANTS AND PROCEDURES

This is a psychometric study. In its majority it followed a cross-sectional design. However, and since one of the aims was to establish the temporal stability of the FIQR, the study also includes a prospective design, with some of the participants responding to FIQR in two different time points.

Participants were recruited among consecutive patients with FM at rheumatology practices in Coimbra (Portugal). All satisfied the 1990 ACR classification criteria[4]. The decision to use these criteria instead of the 2010 ACR criteria was based on the literature, since all other FIQR validation studies, with the exception of the Persian study group[23], have consistently used the 1990 criteria.

Individuals that presented any of the following criteria were excluded from the study: a) being male; b) age < 18 or > 65; c) severe mental disease (e.g., psychosis, dementia); d) neurological disorders (e.g., peripheral neuropathy); e) other comorbid causes of chronic pain (e.g., RA); e) inability to comprehend and/or answer the self-report measures; f) refusal to provide informed consent. A battery of self-report instruments including FIQR and other psychological correlates like depressive symptoms and negative and positive affect was administered to those who accepted to participate in the study. The participants' sociodemographic and clinical data (such as age, age at disease onset, years of education, marital and employment status) were also collected not only to allow a full sample description but also for comparison purposes.

In order to study the stability of the Portuguese version of FIQR, a subsample of participants was asked to respond to the questionnaire a second time, 6 weeks after the initial assessment.

This study is part of a larger research project, approved by the Ethics Committee of the Faculty of Medicine of the University of Coimbra. All participants signed informed consent prior to any study procedure.

MEASURES

The Portuguese versions of the following self-report measures were administered to the participants. These measures were selected attending to the main research aims underlying the larger project from which this investigation derives and primarily because they constitute valid and widely used measures to assess depression and negative/positive affect, constructs that have been closely related to fibromyalgia.

The Revised Fibromyalgia Impact Questionnaire[17] (FIQR) is designed to evaluate different domains of fibromyalgia, specifically function (e.g., "*How much your fibromyalgia made it difficult to…brush or comb your hair*"), overall impact (e.g., "*I was completely overwhelmed by my fibromyalgia symptoms*") and symptoms (e.g., "*Please rate your... level of tenderness to touch*") within a specified time period (past 7 days). It is composed of 21 items (9 for function, 2 for overall impact and 10 for symptoms) rated in a 11-point numeric scale ranging from 0 to 10, with 10 indicating the highest level of severity ("worst"). The score for each domain is calculated by summing the scores of the corresponding items and dividing it by 3 (for function), 1 (for overall impact) and 2 (for symptoms). The score ranges for function, impact and symptoms domains are 0 – 30, 0 – 20 and 0 – 50, respectively. The total score, which varies between 0 and 100, is obtained through the summed score of the three domains, with higher scores reflecting a greater global impact of fibromyalgia on the individual's life.

The Portuguese version of this scale was developed through the following steps. First, permission to use the FIQR was formally obtained from the original authors of the scale. After consent, three health professionals fluent in English and with an extensive experience both in FM and in the procedures underlying the development and validation of assessment tools carried out an independent translation and adaption of the original scale. Since the revised version of the scale maintained several items of the original FIQ, only the modified items were translated into Portuguese. These translations were examined and discussed. Slight changes were introduced in the wording to reflect local cultural aspects. The final version was agreed by consensus and applied to the participants. In order to study the stability of the Portuguese version of FIQR, a subsample of participants was asked to respond to the questionnaire a second time, 6 weeks after the first.

Profile of Mood States[30,31] (PoMS) is a multidimensional scale measuring psychological distress. It comprises 65 adjectives assessing discrete and transitory mood states. Participants rate each item using a 5-point Likert scale (0 = "*Not at all*" to 4 = "*Extremely*") describing the extent to which each descriptor applied to them in the past month. The scale encompasses 6 different mood states, namely: tension/anxiety (e.g., "*on edge*", "*restless*"), depression/dejection (e.g., "*hopeless*", "*blue*"), anger/hostility (e.g., "*spiteful*"; "*bad-tempered*"), fatigue/inertia (e.g., "*worn out*"; "*sluggish*"), confusion/bewilderment (e.g. "*muddled*"; "*confused*") and vigor/activity (e.g., "*energetic* "; "*full of pep*"). The total score of each dimension is obtained by summing the items that compose it. The confusion/bewilderment factor was not used in the present study. Also, taking into consideration the factorial analysis performed by Pereira and coworkers[32], a general score reflecting negative affect was calculated by summing the individual scores of tension/anxiety, depression/dejection, and anger/hostility factors. In turn, positive affect was represented by the items of the vigor/activity dimension.

Beck Depression Inventory II[33, 34] (BDI-II). Adapted from the original Beck Depression Inventory (BDI)[35], this scale was developed to attune with the modifications introduced by the DSM-IV[36] regarding the diagnostic criteria for major depression. Composed by 21 items, rated in a 4-point Likert scale (from 0 to 3 in a crescent degree of severity or intensity) and considering a time frame of two weeks, it is one of the most extensively used measures to assess the presence and severity of depressive symptomatology, both in clinical and community samples. Regarding its factorial structure, a previous study conducted by Pereira and coworkers[37] in a Portuguese sample of women in childbearing age, revealed the existence of a two-factor solution, specifically a cognitive-affective dimension (e.g., "*I feel guilty over many things I have done or should have done*"; "*I am not discouraged about my future*") and a somatic-anxiety dimension (e.g., *I am no more tired or fa-*

tigued than usual"; "*I am less interested in sex than I used to be*"). A total score can be drawn from the sum of all items, with higher scores denoting a greater severity of depressive symptoms. BDI-II demonstrated a high internal consistency (α = .92), an excellent temporal stability (test-retest of .93 over 1 week) and a good convergent and discriminant validity[38]. Similarly, the Portuguese version of the instrument showed good psychometric properties[34, 37].

DATA ANALYSIS

All statistical analysis were performed using the Social Package for Social Sciences 22.0 for Windows [39].

Preliminary analyses were made to ascertain if the variables under study followed normality assumptions. Socio-demographic and clinical variables were explored and differences between test and retest were tested via Independent Samples t-Tests for normally distributed variables and Mann–Whitney *U* test for variables that violated the normality assumption. In the specific case of categorical variables like employment and marital status, the existence of differences between test and retest was examined through the Chi-Square test with Monte Carlo approximation (10 000 replicates). Internal consistency analysis was carried out through item-total correlations and Cronbach's coefficient alpha for the total score and for each dimension. Additionally, Cronbach's alphas excluding each item were estimated and compared to the alpha coefficients of the total scale and of its dimensions. Test-retest reliability was analyzed by computing Pearson/Spearman correlations between the scores obtained in test and retest performed by the 24 participants involved in this process, with the respective coefficients being interpreted according with Cohen's benchmark values[40]. Furthermore, and in order to compare the differences between test and retest scores, Paired-Samples t-Tests and Wilcoxon Signed-Rank tests were performed.

Two-tailed Pearson correlations and Spearman correlations were conducted to test the convergent and discriminant validity of the Portuguese version of FIQR, using as criteria for this effect the variables depressive symptoms (BDI-II) and negative/positive affect (PoMS).

RESULTS

PRELIMINARY ANALYSES

Normality of variables was verified through the Shapiro-Wilk Test. Results showed that age, years of education, FIQR Function, FIQR overall impact, BDI cognitive-affective dimension and BDI-II total score followed a distribution that was significantly different from normal ($p < .05$); all the remaining variables were normally distributed.

A further examination of both Skewness/Kurtosis values and distribution graphics (Q-Q plots) was used to select parametric or non-parametric tests for the subsequent analysis[41, 42].

SOCIO-DEMOGRAPHIC AND CLINICAL VARIABLE DESCRIPTION

The overall study population included 103 consecutive women with fibromyalgia attending local rheumatology clinics. The subsample involved in test-retest was composed of 24 women (23.3 % of the total sample). Table I presents the socio-demographic characteristics of the total sample, test sample and retest subsample and statistical analysis of the differences between the last two. No significant differences regarding socio-demographic characteristics were found between those who filled the FIQR twice and those who did not, except for employment status ($\chi 2 = 10.969$; $p = .013$). Table II presents the central tendency measures for all variables under consideration.

STUDY 1. FIQR RELIABILITY

INTERNAL CONSISTENCY

Results from internal consistency analyses are listed in Table III. FIQR demonstrated a very good internal consistency[43], with alpha values ranging between 0.87 and 0.94. This is in accordance with the reference values proposed by Kline[44] in the context of psychological assessment. Moreover, Pearson's correlations between each corrected item and total score showed that all correlation coefficients were above 0.30, presenting moderate to high magnitudes, ranging from .440 (item 21) to .853 (item 7).

All values of alpha if item deleted were, as recommended, superior to 0.80. Also, results showed that none of the items presented a Cronbach value higher than the alpha of the dimensions or the total scale and therefore their withdrawal would not enhance, but instead lessen, FIQR's dimensional and overall internal consistency.

TEMPORAL STABILITY

Statistically significant ($p \leq .001$) Spearman and Pearson correlation coefficients were found between test

TABLE I. CENTRAL TENDENCY MEASURES AND STATISTICAL DIFFERENCES OF THE SOCIO-DEMOGRAPHIC VARIABLES BETWEEN TEST AND RETEST SAMPLES

	Total Sample (N = 103ϕ)	Test (n = 79ϕ)	Retest (n = 24ϕ)	Test vs. Retest
Variables	M (SD) Md (IQR)	M (SD) Md (IQR)	M (SD) Md (IQR)	
Age	47.32 (10.63)	46.30 (11.22)	50.67 (7.66)	U = 736.00;
	49.00 (17)	49.00 (18)	53 (14)	Z = -1.655, p = .098 Test < Retest
Age at disease onset	35.82 (11.57)ϕ	34.78 (11.44)	37.57 (11.24)	t (95) = -.825; p = .412
Years of education	11.31 (4.86)ϕ	11.73 (5.02)	9.96 (4.11)	U = 733.50;
	12.00 (7)	12.00 (7)	9.00 (17)	Z = -1.617, p = .106 Test > Retest
	n (%)	n (%)	n (%)	
Employment Status				
Employed	65 (65 %)	54 (69.2 %)	11 (50 %)	
Unemployed	20 (20 %)	17 (21.8 %)	3 (13.6 %)	χ2 = 10.969; p = .013
On sick leave	7 (7 %)	4 (5.1 %)	3 (13.6 %)	99 % CI =].010 – .016[
Retired	8 (8 %)	3 (3.8 %)	5 (22.7 %)	
Marital status				
Single	11 (10.7 %)	10 (12.7 %)	1 (4.7 %)	
Married/living with partner	86 (83.5 %)	64 (81 %)	22 (91.7 %)	χ2 = 3.506; p = .307
Divorced/separated	4 (3.9 %)	4 (5.1 %)	-	99 % CI =].295 – .319[
Widowed	2 (1.9 %)	1 (1.3 %)	1 (4.2 %)	

Note. M = Mean; SD = Standard Deviation; ϕ = includes values inferior to sample size due to missing values; t = Independent Samples t-test; χ2 = Chi-Square Test; CI = Confidence Interval

and retest scores for function, overall impact and symptoms dimensions, with their magnitude being high (.617 to .886). Likewise, the test-retest correlation coefficient of the total FIQR score was high (r = .835; $p \leq .001$), pointing out to a good temporal stability. Paired-Samples t-Tests and Wilcoxon Signed-Rank tests revealed the absence of statistically significant differences between test and retest scores ($p \geq .05$), except for the symptoms dimension (t = 7.061; $p \leq .001$). Results are listed on Table IV.

STUDY 2. FIQR CONVERGENT AND DISCRIMINANT VALIDITY

Correlation coefficients (cf. Table V) showed that all dimensions and total score of FIQR were significantly, positively, and moderately to strongly associated with depressive symptoms ($r > .30$; $p \leq .01$). The only exception was the association between the dimensions function and overall impact of FIQR and the cognitive-affective factor of the BDI-II, which correlated poorly, although significantly (r = .298, $p \leq .01$; r = .289, $p \leq .01$, respectively). Also, correlation coefficients pointed to a significant and positive association between all FIQR dimensions and the total score and negative affect of PoMS. This correlation is especially strong between the symptoms dimension and total score, which presented greater significance and magnitude of association (r = .427, $p \leq .01$; r = .354, $p \leq .01$, respectively). On the contrary, there was an inverse and significant relationship between positive affect and the total score of FIQR as well as for the majority of its dimensions. This association was weakest for overall impact (r = -.186) that, despite close, did not reach statistical significance (p = .059). Such results corroborate the convergent and discriminant validity of the scale.

DISCUSSION

The aim of this study was to translate the Revised Fi-

TABLE II. MEANS (M), STANDARD DEVIATIONS (SD), MINIMUM/MAXIMUM VALUES AND INTERNAL CONSISTENCY VALUES OF THE VARIABLES UNDER STUDY (N = 103)

Variables	M	SD	Min-Max	α
FIQR_Function	15.64	7.84	0-30	–
FIQR_Overall Impact	9.56	6.25	0-20	–
FIQR_Symptoms	31.51	8.94	6.5-50	–
FIQR_Total	56.93	19.83	10.5-100	–
BDI_Somatic-Anxiety	9.28	4.71	0-21	.82
BDI_Cognitive-Affective	9.48	7.58	0-37	.90
BDI_Total	18.82	11.53	0-58	.93
PoMS_Positive Affect	55.42	29.35	3-138	.97
PoMS_Negative Affect	56.38	29.98	3-142	.97

TABLE III. ITEM-TOTAL CORRELATIONS (R) AND CRONBACH'S ALPHA IF ITEM DELETED (α) FOR THE PORTUGUESE VERSION OF THE FIQR

	Dimension		Total	
Items	Correlation item-total	α if item deleted	Correlation item-total	α if item deleted
FIQR_1	.620	.914	.636	.932
FIQR_2	.652	.912	.613	.933
FIQR_3	.649	.912	.603	.933
FIQR_4	.738	.906	.692	.931
FIQR_5	.731	.907	.629	.933
FIQR_6	.767	.904	.749	.930
FIQR_7	.853	.897	.826	.929
FIQR_8	.570	.917	.569	.934
FIQR_9	.800	.901	.747	.930
Function (Global)	.92			
FIQR_10	.785	-	.681	.932
FIQR_11	.785	-	.633	.933
Impact (Global)	.88			
FIQR_12	.710	.847	.693	.932
FIQR_13	.584	.856	.556	.934
FIQR_14	.568	.857	.625	.933
FIQR_15	.619	.855	.582	.934
FIQR_16	.675	.848	.593	.933
FIQR_17	.567	.857	.498	.935
FIQR_18	.557	.858	.513	.934
FIQR_19	.600	.854	.568	.934
FIQR_20	.570	.857	.613	.933
FIQR_21	.440	.866	.381	.936
FSymptoms (Global)	.87			
FIQR_Total	.94			

TABLE IV. TEST-RETEST RELIABILITY ANALYSES OF THE PORTUGUESE VERSION OF THE FIQR VIA CORRELATIONS (SPEARMAN/PEARSON CORRELATION COEFFICIENTS) AND TEST-RETEST COMPARISONS (WILCOXON SIGNED-RANK TEST AND PAIRED-SAMPLES T-TEST)

Variables	Test (n = 24ϕ) M (SD) Mdn (IQR)	Retest (n = 24ϕ) M (SD) Mdn (IQR)	rS	Z	p
FIQR_Function	17.96 (6.84) 19.67 (9.17)	17.14 (6.45) 16.67 (10)	.641***	-.699	.485
FIQR_Overall Impact	10.21 (6.51) 10.00 (12.50)	10.25 (5.65) 10.00 (7.50)	.617***	-.081	.935
			rP	**t**	**p**
FIQR_Symptoms	33.04 (8.90) 34.25 (10.50)	26.67 (8.07) 26.50 (11.50)	.886***	7.061	≤ .001
FIQR_Total	60.78 (18.47) 62.42 (27.21)	60.04 (19.66) 61.92 (34.67)	.835***	.315	.756

Note. ϕ = Missing cases excluded pairwise; M = Mean; SD = Standard Deviation; Mdn = Median; IQR = Interquartile Range; rS = Spearman correlation; rP = Pearson correlation; Z = Wilcoxon Signed-Rank test; t = Paired-Samples t-test; *** p ≤ .001; ** p ≤ .01; * p ≤ .05

bromyalgia Impact Questionnaire (FIQR) to Portuguese of Portugal and to evaluate its psychometric properties, specifically its internal consistency, temporal stability and convergent and discriminant validity.

Our findings suggest that the tool produced in this study is a psychometrically valid measure in Portuguese FM female patients.

Descriptive analyses showed that the socio-demographic characteristics of FM participants are in consonance with those reported by international[45,46] and national studies[47,8], that is, middle-aged women, married and employed. Also, it demonstrated that the function domain of the Portuguese version of FIQR showed a mean value almost equal (M = 15.64 ± 7.84) to that observed in the study leading to the original version[17] (M = 15.6 ± 7.7). In turn, the symptoms domain and the total FIQR score presented a slightly higher average value (M = 31.51 ± 8.94; M = 56.93 ± 19.83) than the average values reported by Bennet and coworkers[17] (M = 30.0 ± 8.8; M = 56.6 ± 20.0). On the contrary, the overall impact domain evidenced a slightly lower average value (M = 9.56 ± 6.25) than the average value described in the original study[17] (M = 11.0 ± 5.4).

As for scale reliability, internal consistency analysis revealed that the Portuguese version of the FIQR possesses high internal consistency, with a Cronbach's alpha of 0.94, which is in line with the results obtained not only for the original version of the scale (α = 0.95)[17] but also in the Spanish (α = 0.91)[19], Turkish (α = 0.89)[20], Moroccan, Jordanian Arabic (α = 0.91)[21,22], Persian (α = 0.87)[23] and Brazilian (α = 0.96)[18] versions. Looking more closely to the domains' internal consistency, we observe that Cronbach's alpha values are equally high (between α = 0.87 and α = 0.92). Bearing in mind that Cronbach's alpha value hinge on the number of items that compose the scale, it is noteworthy that the overall impact dimension, which is composed of only two items, has demonstrated such good alpha value. This pattern of results along with the expressive item-total correlations and the relevant contribution of each item for the scale internal consistency is favorable to the scale's reliability in measuring fibromyalgia impact.

In which concerns temporal stability, the statistical procedures performed indicate a high test-retest reliability with correlation coefficients close to those obtained in the Spanish (r = .82)[19], Turkish (r = .84)[20], Moroccan (r = .84)[21], and Jordanian Arabic (r = .93)[22] study groups. No comparison was made with the original version of the FIQR, since no data is available on its temporal stability. Additionally, repeated measures analyses showed that the participant's responses to the items that compose the function and the overall impact domains did not differ significantly from test to retest, giving further support to the temporal stability of the scale at short term. Contrariwise, the symptoms domain showed significant differences, with a clear decrement in the symptoms mean score from test to retest. This finding is in line with previous studies[11-13] that have

TABLE V. SPEARMAN AND PEARSON CORRELATION COEFFICIENTS BETWEEN FIBROMYALGIA IMPACT (FIQR), DEPRESSIVE SYMPTOMS (BDI-II) AND POSITIVE AND NEGATIVE AFFECT (POMS) (N=103)

Variables	1δ	2δ	3ϕ	4ϕ	5ϕ	6δ	7δ	8ϕ
1. FIQR_Function$^{\delta}$	1	–	–	–	–	–	–	–
2. FIQR_ Impact$^{\delta}$	.541**	1	–	–	–	–	–	–
3. FIQR_ Symptoms$^{\phi}$	.665**	.608**	1	–	–	–	–	–
4. FIQR_Total$^{\phi}$	.835**	.799**	.891**	1	–	–	–	–
5. BDI_SA$^{\phi}$	.316**	.424**	.601**	.530**	1	–	–	–
6. BDI_CA$^{\delta}$	.298**	.289**	.540**	.464**	.753**	1	–	–
7. BDI_Total$^{\delta}$	.318**	.362**	.583**	.508**	.896**	.951**	1	–
8. PoMS_PA$^{\phi}$	-.307**	-.186	-.370**	-.371**	-.428**	-.407**	.407**	1
9. PoMS_NA$^{\phi}$	.219*	.206*	.427**	.354**	.618**	.735**	.727**	-.262**

Note. FIQR = Revised Fibromyalgia Impact Questionnaire; BDI = Beck Depression Inventory-II; SA = Somatic-Anxiety dimension; CA = Cognitive-Affective dimension; PoMS = Profile of Mood States; NA = Negative Affect; PA = Positive Affect; δ = Spearman correlation coefficients; ϕ = Pearson correlation coefficients. ** p ≤ .01; * p ≤ .05

stressed out FIQ responsiveness to symptoms variability and have proposed this scale as a critical instrument to spot changes occurring in response to pharmacological or psychosocial interventions or simple fluctuations of the disease. However, Dunkl and coworkers[12] shed some light to the fact that if, on one hand, FIQ proved to be particularly sensitive to minor improvements in the individuals' clinical status, on the other hand, it appears to lack discriminative power regarding those whose clinical status have deteriorated. We hypothesize that this difference is probably due to a therapeutic effect of the clinical encounter and the disclosure of diagnosis and its nature. Still, these findings, although significant, must be interpreted with caution, given that FIQ was not included in the present study, FIQR is somewhat different from its predecessor and its sensitivity to change or minimal clinical important difference have not yet been established. Yet, it is also true that the reported correlation between FIQ and its improved version (FIQR) is sufficiently strong to presume that there is a high degree of similarity/ /equivalence between the response patterns obtained in each scale, allowing to cautious comparison across studies that have used one of them[17].

To assess the construct validity of FIQR, we examined the pattern of associations between FIQR and other constructs that have been consistently related to fibromyalgia, such as depressive symptomatology[48,49] and positive/negative affect[50,51]. As expected, correlational analyses showed that higher levels of depressive symptoms were associated with greater symptoms severity, greater functional impairment and overall impact. Such results are consistent with previous findings[52-54] and again underline the potentially harmful effect that the interaction between the two can have on the clinical presentation and course of FM[54,55]. Furthermore, the strong association found between the FIQR dimension "symptoms" and the somatic-anxiety dimension of the BDI-II seems to point to a possible overlap, at least partially, between depressive symptoms of a predominantly vegetative nature and FM symptoms. This is not unexpected, in the way that other studies have highlighted the existence of shared neurophysiological pathways between fibromyalgia and depression[56]. Also, the considerable magnitude of the correlation obtained between the cognitive-affective dimension of BDI-II and the FIQR symptoms indicates that this is not a spurious outcome, further supporting that the link between fibromyalgia symptoms and depressive symptoms goes beyond the mere similarity in clinical expression. In fact, Chang and coworkers[57] have demonstrated the existence of a bidirectional association between depression and fibromyalgia in such a way that the presence of one enhances the likelihood or liability to develop the other. One should note, however, that in the present study we have only conducted correlational analyses and it is not our aim to imply a causal relationship between depressive symptoms and FIQR domains and total score.

Concerning affect, statistical analyses showed that increased levels of FM-related symptoms, overall impact and dysfunction as measured by the FIQR are

associated with higher levels of negative affect and lower levels of positive affect (with the exception of overall impact in this case since the correlation between the two was not statistically significant). In line with this, some authors argued that fibromyalgia patients tend to exhibit lower levels of positive affect and present marked difficulties in regulating positive affect, putting them at increased risk of experiencing both higher levels of clinical symptoms (such as pain) and negative affect[51,58,59]. Similarly, Hasset and coworkers[50] and Toussaint and coworkers[59] stated that the presence of an unbalanced interplay between positive and negative affect contributes significantly to the poorer physical and mental health of fibromyalgia patients when compared to those patients (with and without fibromyalgia) that display a healthy affective balance.

To sum up, the results obtained point to an acceptable convergent and discriminant validity of the Portuguese version of FIQR with other psychological measures, which is consistent with other validation studies despite the use of different constructs as comparison criteria.

Our study has several limitations that must be acknowledged. First, the representativeness of the sample can be questioned due to its size, recruitment area and gender. Even though it is widely recognized that FM is strikingly more prevalent among women, it also occurs in men, there being gender differences in the clinical expression of FM[60]. Hence, future studies should use larger samples and explore if the scale remains a reliable and suitable tool when used in males. Second, we did not control for clustered participants according with the existence and level of comorbid psychiatric disorders such as depression, what might have influence FIQR scores. Third, we did not use the FIQ and therefore we cannot evaluate neither the differences nor the similarities between the two scales. Finally and like the original study, FIQR's responsiveness to clinical change was not assessed.

These limitations do not question the conclusion that the Portuguese FIQR is a valid, usable, reliable, consistent, easy-to-score tool for the assessment of Portuguese FM patients. FIQR does not require prior specific training and can be used both in clinical and research settings.

CONCLUSION

Altogether these findings suggest that the Portuguese version of the FIQR is a suitable, reliable and valid measure to asses functional and health status in fibromyalgia. Given the complexity and variability of fibromyalgia profiles, the existence of a valid and brief assessment instrument that measures the perceived current state of FM symptoms and associated impact is of extreme relevance and usefulness both in research and clinical settings.

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