Quality of life in patients with osteoporosis fractures: Cultural adaptation, reliability and validity of the Osteoporosis Assessment Questionnaire

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Abstract

Objective

The purpose of this study was to translate into Brazilian-Portuguese the Osteoporosis Assessment Questionnaire (OPAQ), and to evaluate its reliability and validity.

Methods

The OPAQ was translated into Brazilian-Portuguese. This version was then back-translated into an English version which was compared to the original version, and a second Brazilian-Portuguese version was generated. This draft version of the Brazilian-Portuguese OPAQ was administered to 30 patients with lumbar osteoporosis and no fractures. The non-applicable questions were modified and, after being administered again, this Brazilian-Portuguese version of the OPAQ was accepted as definitive. Its reliability was tested in 30 osteoporotic out-patients, and was administered three times to the patients to check the intra/interobserver reliability. The patients were also clinically evaluated using HAQ, FIQ and a numerical rating scale for pain. For all patients the number of fractures and the bone mineral density at the spine were determined.

Results

The mean age of the patients was 69 years (54 to 89 years) and the mean number of fractures was 2.72. Twenty-one patients (70%) had had more than one vertebral fracture. All of the questionnaire components, except for mood (c16), presented statistically significant coefficients for intra/ interobserver reliability. The highest score was observed for "the fear of falling" (6.70). Correlations between the OPAQ components and the number of fractures, bone density and Z-score were not statistically significant.

Conclusions

This Brazilian-Portuguese version of the OPAQ is a reliable and valid instrument. Other aspects than bone mineral density and the number of fractures have an important influence on the quality of life in patients with osteoporosis and fractures.

Key words

Osteoporosis, fractures, quality of life, questionnaire.

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Introduction

Osteoporosis is clinically relevant once a fracture has occurred. Hip fracture causes functional disability and inactivity, whereas vertebral fractures reduce pulmonary, cardiac, gastric and urinary bladder capacities (1-3). In addition, osteoporotic patients have psychological sequelae such as anxiety, depression, loss of self-esteem and even social isolation (4). Recently, questionnaires to evaluate the quality of life in patients with osteoporosis have been studied. One of the few osteoporosis questionnaire developed is the "Osteoporosis Assessment Questionnaire" (OPAQ) (5-11).

To be used internationally, however, this questionnaire must be translated into the respective local languages and must also be culturally adapted. In addition, after translation and cultural adaptation the measurement properties of the instrument have to be re-evaluated in order to ensure that it retains the original version's properties. The purpose of this study was to translate the OPAQ into Brazilian-Portuguese, and to evaluate the reliability and validity of this translated version.

Patients and methods

The translation from English into Brazilian-Portuguese and the cross-cultural adaptation of the OPAQ were carried out according to internationally recommended criteria (12). OPAQ (6) is a disease-targeted self-assessment instrument based on the AIMS format. It includes 5 general questions about health and quality of life and another 18 itens that measure physical function, psychological status, symptoms and social interaction. The final OPAQ score is based on a scale from 1 to 10, with a lower value reflecting a better health status (6).

Translation into Brazilian-Portuguese

The OPAQ was first translated into Brazilian-Portuguese by two independent translators whose native language is Brazilian-Portuguese. These two versions were compared and after a consensus meeting involving the two translators and two authors a single Portuguese version was generated (first version).

This first version was submitted to a native English speaking professor who back-translated the questionnaire into English. This version was compared to the original version by a second consensus group including the English professor and two authors, who defined the second Brazilian-Portuguese version of the instrument.

Cross-cultural adaptation

This preliminary Brazilian-Portuguese version of the OPAQ was administered to 30 patients with lumbar osteoporosis and no fractures. The questions that were not understood, or the items containing activities never performed by at least 15% of patients were considered non-applicable and modified. The cut-off point of 15% was chosen after we found values ranging from 10 to 20% in the reports in the literature involving the translation of health questionnaires. This modified OPAQ was administered again until all the questions were considered culturally appropriate. The final Brazilian-Portuguese version was thus defined.

Assessment of reliability

The reliability of the Brazilian-Portuguese version of OPAQ was tested in a series of 30 osteoporotic out-patients who were followed at the Rheumatology Division of UNIFESP-EPM from January 1995 to April 1997. All of them had lumbar osteoporosis and a history of osteoporotic fractures.

The reliability of the Brazilian-Portuguese OPAQ was evaluated on the basis of three different interviews. The questionnaire was administered three times to each patient, twice on the first day of the study (by observers 1 and 2 respectively) to test the inter-observer reliability, and a third time seven days later by observer 1 to test the intra-observer reliability.

Assessment of validity

Twenty of the 30 patients initially studied were also clinically evaluated using the following outcome measures: the Health Assessment Questionnaire (HAQ) (13); the Fibromyalgia Impact Questionnaire (FIQ) (14); and pain related to osteoporosis during the last week using a numerical rating scale (NRS) in which 0 = no pain and 10 = the worst possible pain.

For all patients dorsal and lumbar X-rays were taken. Vertebral fracture was defined as the radiographic presence of a 15% or more anterior height reduction (relative to posterior height) (15). The number of vertebral fractures was also determined. The history of fractures at other sites was recorded, and X-rays were carried out only when there was any doubt.

Patients participating in this study had their bone mineral density (BMD) measured at the spine (L2-L4) by dual-energy X-ray absorptiometry (Lunar Radiation Corporation, model DPX , Madison, WI).

Statistical analysis

Descriptive statistical analysis was carried out to characterise the demographic and clinical data. Intra- and inter-observer reliability and validity were evaluated though the use of Spearman's correlation coefficient. Values above 0.364 for reliability and above 0.450 for validity were considered statistically significant ($p < 0.05$).

Results

Cross-cultural adaptation

Questions number 3 (How often are you able to do errands in the neighborhood?) and 78 (How often do you have to rely on others for assistance?) were considered non-applicable by more than 15% of the 30 patients studied. When we translated these questions into Portuguese they lost their cultural meaning and were not understood by the patients. After modification, the instrument was re-applied to 18 osteoporotic patients, and both questions were understood by more than 90%. This modified version was administered two times to make sure that all of the questions were appropriate. The mean time required for administration of the questionnaire was 35 minutes.

Reliability

Clinical and demographic characteristics of the 30 patients studied are presented in Table I. Their mean age was 69 years (range 54 to 89 years) and the mean number of fractures was 2.72 (range 1 to 7). Fractures were more common at the dorsal and lumbar spine (70%). Fractures had occurred in the femoral neck in 20%, trochanter in 6.66%, radio in 13,3%, ribs in 6.66%, ankles in 6.66%, knees in 6.66% and fingers in 6.66%. Twenty-one patients (70%) had had more than one vertebral fracture. High blood pressure was observed in 13.3%.

Table I. Clinical and demographic characteristics of the 30 patients with osteoporosis and fractures included in the reliability evaluation of the Brazilian-Portuguese version of the OPAQ.

Female sex	30
Race: White: Non-white	27: 3
Disease duration (yrs.)*	5.66 (5.49)
Number of fractures*	2.72 (1.68)
Lumbar (L2-L4) bone density (g/cm^2)*	0.723 (0.143)
Z scores *	-3.90 (1.11)
Minimum and maximum	-7.04 and -2,55
Illiterate patients (%)	6 (20%)

* mean and SD

The intra- and inter-observer reliability coefficients are presented in Table II. All the components of the instrument, except for mood (c16), presented statistically significant coefficients for intra/interobserver reliability. The Spearman's correlation coefficient varied from 0.40 to 0.87 and from 0.48 to 0.82 for the intra and inter-observer evaluations, respectively.

Validity

Twenty patients from the series of 30 patients used to test the reliability of the Portuguese OPAQ participated in the evaluation of the questionnaire's validity. Although their clinical and demographic characteristics were similar, they were younger (mean age 64 years), and had more fractures (3.15 ± 1.75) and a lower lumbar bone density (0.673 ±

Table II. Intra- and inter-observer reliability of each component of the Brazilian-Portuguese version of the OPAQ.

OPAQ components	Score (1 - 10) Mean	SD	Spearman's correlation coefficient Intra-observer	Inter-observer
C1 (life as a whole)	3.70	(1.46)	0.46	0.67
C2 (quality of life)	3.23	(2.19)	0.74	0.78
C3 (health)	3.83	(0.74)	0.40	0.57
C4 (health now)	2.66	(1.32)	0.51	0.59
C5 (compared to other people your age)	2.56	(0.77)	0.66	0.56
c1 (mobility)	2.60	(3.50)	0.87	0.78
c2 (walking and bending)	4.78	(3.09)	0.66	0.64
c3 (back discomfort)	5.05	(3.62)	0.44	0.56
c4 (flexibility)	2.16	(2.89)	0.75	0.76
c5 (self-care tasks)	0.22	(0.70)	0.73	0.67
c6 (household tasks)	1.91	(3.20)	0.72	0.77
c7 (changes of position)	2.50	(3.14)	0.77	0.70
c8 (fear of falling)	6.76	(2.66)	0.79	0.65
c9 (social activity)	5.53	(1.55)	0.43	0.67
c10 (support of family and friends)	1.72	(3.40)	0.70	0.62
c11 (back pain related to osteoporosis)	4.30	(3.53)	0.60	0.70
c12 (sleep)	3.70	(2.24)	0.44	0.48
c13 (fatigue)	4.33	(2.73)	0.81	0.82
c14 (work)	3.27	(3.11)	0.70	0.73
c15 (level of tension)	4.65	(2.9)	0.83	0.75
c16 (mood)	4.20	(2.01)	0.36	0.30
c17 (body image)	3.75	(2.82)	0.79	0.72
c18 (independence)	4.16	(3.50)	0.64	0.57

Table III. Scores for each component of the OPAQ, HAQ, FIQ and pain NRS in 20 patients included in the validation of the Brazilian-Portuguese version of the OPAQ.

OPAQ components	Mean (± SD)		Minimum	Maximum
C1 (life as a whole)	3.55	(1.60)	1.00	7.00
C2 (quality of life)	3.10	(2.49)	0.00	10.00
C3 (health)	3.80	(0.69)	2.00	5.00
C4 (health now)	2.55	(1.31)	1.00	5.00
C5 (compared to other people your age)	2.50	(0.82)	1.00	4.00
c1 (mobility)	3.15	(3.59)	0.00	10.00
c2 (walking and bending)	4.80	(3.36)	0.00	10.00
c3 (back discomfort)	5.17	(4.04)	0.00	10.00
c4 (flexibility)	2.62	(2.94)	0.00	10.00
c5 (self-care tasks)	0.34	(0.84)	0.00	2.50
c6 (household tasks)	2.25	(3.25)	0.00	10.00
c7 (changes of position)	2.34	(3.21)	0.00	10.00
c8 (fear of falling)	6.70	(2.82)	0.00	10.00
c9 (social activity)	5.63	(1.52)	3.00	8.50
c10 (support of family and friends)	1.61	(3.40)	0.00	10.00
c11 (back pain related to osteoporosis)	4.45	(2.74)	0.00	10.00
c12 (sleep)	3.59	(2.15)	0.00	8.12
c13 (fatigue)	4.37	(2.86)	0.00	10.00
c14 (work)	3.21	(3.18)	0.00	10.00
c15 (level of tension)	3.96	(2.76)	0.00	9.00
c16 (mood)	3.92	(2.02)	1.50	10.00
c17 (body image)	4.43	(2.83)	0.00	10.00
c18 (independence)	4.66	(3.69)	0.00	10.00
HAQ (0 - 3)	0.95	(0.92)	0.00	2.62
FIQ (0 - 100)	43.3	(20.73)	10.00	78.81
Pain NRS (0 - 10)	4.75	(3.19)	0.00	10.00

0.151 g/cm^2) than the group of 30 patients as a whole.

The mean values for each component of the OPAQ, and the final scores for the HAQ, FIQ and NRS are presented in Table III. The highest scores were observed in the following components: fear of falling (6.70), social activities (5.63), back discomfort (5.17), walking and bending (4.80), back pain related to osteoporosis (4.45), independence (4.66) and body image (4.43).

The correlation coefficients between the OPAQ components and the HAQ, FIQ and pain NRS are shown in the Table IV. The highest coefficients between the OPAQ and HAQ were those related to mobility (0.88), household tasks (0.80) and fatigue (0.80). Correlations between OPAQ and FIQ were highest for fatigue (0.93), work (0.88) and back pain related to OP (0.87). The latter had the highest correlation with the pain NRS (0.83).

The correlations between the components of the OPAQ and the number of fractures, bone density and Z score were not statistically significant. Similar results were observed when we correlated pain NRS, HAQ and FIQ with the same parameters (Table V).

Discussion

Our results confirm that the OPAQ is a reliable and valid instrument that can be used to evaluate patients with osteoporosis. Despite the fact that the population studied was from a low socio-economic and cultural class, only two questions needed to be modified during the translation from English into Brazilian-Portuguese. The OPAQ, like the other available questionnaires (16) for the evaluation of osteoporotic patients, have not been yet translated from English to any other language.

Self-administration of the questionnaire was not used in the case of our patients because Brazilians are not used to answering such questionnaires. The mean interviewer-administration time was 35 minutes. A similar time has been described by Silverman *et al.* (6) using the self-administration strategy.

Mood was the only component that was not reliable. This result was somewhat to be expected since mood is an unstable variable and can be influenced by many external factors.

The components with the high test scores found in our study were equivalent to those reported by Cook *et al.* (5), Helmes *et al.* (8) and the Osteoporosis Quality of Life Study Group (11) using other scales. The fear of falling received the highest score (6.70). This characteristic is generally more common among elderly people, particularly in elderly osteoporotic patients and is probably associated with the fear of suffering new fractures. In addition, the diagnosis of osteoporosis may also have an emotional impact, worsening the physical limitation of these patients.

Social activities had a high score (5.63). Although Cook *et al.* (5) studied a population with a higher socio-economic status, they reported a similar result. It must be kept in mind that this parameter does not only depend on the patients' socio-economic level.

There was no correlation between the OPAQ components and bone density or the number of fractures. Our results were similar to those of Cook *et al.* (5). The loss of bone mass is asymptomatic and fractures occur chronically and do not specifically influence the quality of life. The quality of life as a whole therefore cannot be evaluated in osteoporotic patients by routine testing using such instruments as the OPAQ. Parameters other than bone density and fractures are important determinants of the quality of life, pain and disability. A more complete evaluation considering these aspects could enhance our knowledge of this disease and improve the management of osteoporosis patients.

Table IV. Spearman's correlation coefficient between OPAQ items, HAQ, FIQ and pain NRS.

OPAQ components	HAQ	FIQ	Pain NRS
C1 (life as a whole)	0.45*	0.48*	0.57*
C2 (quality of life)	0.50*	0.38	0.42
C3 (health)	0.70*	0.80*	0.73*
C4 (health now)	0.23	0.30	0.10
C5 (compared to other people your age)	0.80*	0.67*	0.68*
c1 (mobility)	0.88*	0.81*	0.67*
c2 (walking and bending)	0.77*	0.77*	0.82*
c3 (back discomfort)	0.69*	0.71*	0.59*
c4 (flexibility)	0.75*	0.80*	0.67*
c5 (self-care tasks)	0.50*	0.28	0.19
c6 (household tasks)	0.80*	0.75*	0.58*
c7 (changes of position)	0.75*	0.77*	0.55*
c8 (fear of falling)	0.49*	0.43	0.42
c9 (social activity)	0.47*	0.35	0.29
c10 (support of family and friends)	0.23	0.23	0.15
c11 (back pain related to osteoporosis)	0.76*	0.87*	0.83*
c12 (sleep)	0.38	0.51*	0.31
c13 (fatigue)	0.80*	0.93*	0.70*
c14 (work)	0.79*	0.88*	0.61*
c15 (level of tension)	0.43	0.58*	0.57*
c16 (mood)	0.48*	0.59*	0.58*
c17 (body image)	0.56*	0.63*	0.60*
c18 (independence)	0.63*	0.42	0.52*

Table V. Spearman's correlation coefficient between the OPAQ components and the number of fractures, bone mineral density (BMD) and z-score.

OPAQ components	No. of fractures	BMD	z score
C1 (life as a whole)	0.01	0.04	0.07
C2 (quality of life)	0.02	0.37	0.28
C3 (health)	0.19	0.20	0.19
C4 (health now)	0.18	0.10	0.29
C5 (compared to other people your age)	0.17	0.06	0.01
c1 (mobility)	0.09	0.03	0.03
c2 (walking and bending)	0.17	0.32	0.21
c3 (back discomfort)	0.06	0.03	0.01
c4 (flexibility)	0.03	0.13	0.09
c5 (self-care tasks)	0.11	0.34	0.31
c6 (household tasks)	0.00	0.01	0.05
c7 (changes of position)	0.01	0.13	0.04
c8 (fear of falling)	0.02	0.18	0.15
c9 (social activity)	0.32	0.08	0.12
c10 (support of family and friends)	0.01	0.10	0.03
c11 (back pain related to osteoporosis)	0.20	0.44	0.35
c12 (sleep)	0.11	0.09	0.01
c13 (fatigue)	0.14	0.22	0.13
c14 (work)	0.00	0.10	0.01
c15 (level of tension)	0.35	0.28	0.23
c16 (mood)	0.21	0.32	0.24
c17 (body image)	0.38	0.19	0.09
c18 (independence)	0.09	0.04	0.13
HAQ (0 - 3)	0.04	0.01	0.06
FIQ (0 - 100)	0.07	0.20	0.08
Pain NRS (0 - 10)	0.10	0.21	0.11

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