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## Original article

# Quality of life in spondyloarthritis: analysis of a large Brazilian cohort<sup>☆</sup>



Sandra L.E. Ribeiro<sup>a</sup>, Elisa N. Albuquerque<sup>b</sup>, Adriana B. Bortoluzzo<sup>c</sup>, Célio R. Gonçalves<sup>d</sup>, José Antonio Braga da Silva<sup>e</sup>, Antonio Carlos Ximenes<sup>f</sup>, Manoel B. Bértolo<sup>g</sup>, Mauro Keiserman<sup>h</sup>, Rita Menin<sup>i</sup>, Thelma L. Skare<sup>j</sup>, Sueli Carneiro<sup>k</sup>, Valderílio F. Azevedo<sup>l</sup>, Walber P. Vieira<sup>m</sup>, Washington A. Bianchi<sup>n</sup>, Rubens Bonfiglioli<sup>o</sup>, Cristiano Campanholo<sup>p</sup>, Hellen M.S. Carvalho<sup>q</sup>, Izaias P. Costa<sup>r</sup>, Angela L.B. Pinto Duarte<sup>s</sup>, Charles L. Kohem<sup>t</sup>, Nocy H. Leite<sup>u</sup>, Sonia A.L. Lima<sup>v</sup>, Eduardo S. Meirelles<sup>w</sup>, Ivânio A. Pereira<sup>x</sup>, Marcelo M. Pinheiro<sup>y</sup>, Elizandra Polito<sup>z</sup>, Gustavo G. Resende<sup>aa</sup>, Francisco Airton C. Rocha<sup>bb</sup>, Mittermayer B. Santiago<sup>cc</sup>, Maria de Fátima L.C. Sauma<sup>dd</sup>, Valéria Valim<sup>ee</sup>, Percival D. Sampaio-Barros<sup>d,\*</sup>, from the Brazilian Registry of Spondyloarthritis

<sup>a</sup> Universidade Federal do Amazonas, Manaus, AM, Brazil

<sup>b</sup> Universidade do Estado do Rio de Janeiro, Rio de Janeiro, RJ, Brazil

<sup>c</sup> Instituto Insper de Educação e Pesquisa, São Paulo, SP, Brazil

<sup>d</sup> Disciplina de Reumatologia, Faculdade de Medicina, Universidade de São Paulo, São Paulo, SP, Brazil

<sup>e</sup> Universidade de Brasília, Brasília, DF, Brazil

<sup>f</sup> Hospital Geral de Goiânia, Goiânia, GO, Brazil

<sup>g</sup> Universidade de Campinas, Campinas, SP, Brazil

<sup>h</sup> Pontifícia Universidade Católica, Porto Alegre, RS, Brazil

<sup>i</sup> Faculdade de Medicina de São José do Rio Preto, São José do Rio Preto, SP, Brazil

<sup>j</sup> Hospital Evangélico de Curitiba, Curitiba, PR, Brazil

<sup>k</sup> Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil

<sup>l</sup> Universidade Federal do Paraná, Curitiba, PR, Brazil

<sup>m</sup> Hospital Geral de Fortaleza, Fortaleza, CE, Brazil

<sup>n</sup> Santa Casa do Rio de Janeiro, Rio de Janeiro, RJ, Brazil

<sup>o</sup> Pontifícia Universidade Católica, Campinas, SP, Brazil

<sup>p</sup> Santa Casa de São Paulo, São Paulo, SP, Brazil

<sup>q</sup> Hospital de Base do Distrito Federal, Brasília, DF, Brazil

<sup>r</sup> Universidade Federal do Mato Grosso do Sul, Campo Grande, MS, Brazil

<sup>s</sup> Universidade Federal de Pernambuco, Recife, PE, Brazil

<sup>t</sup> Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil

<sup>u</sup> Faculdade de Medicina Souza Marques, Rio de Janeiro, RJ, Brazil

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\* Corresponding author.

E-mail: [pdsampaio Barros@uol.com.br](mailto:pdsampaio Barros@uol.com.br) (P.D. Sampaio-Barros).

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<sup>v</sup> Hospital do Servidor Público Estadual, São Paulo, SP, Brazil

<sup>w</sup> Instituto de Ortopedia e Traumatologia, Universidade de São Paulo, São Paulo, SP, Brazil

<sup>x</sup> Universidade Federal de Santa Catarina, Florianópolis, SC, Brazil

<sup>y</sup> Universidade Federal de São Paulo, São Paulo, SP, Brazil

<sup>z</sup> Santa Casa de Belo Horizonte, Belo Horizonte, MG, Brazil

<sup>aa</sup> Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brazil

<sup>bb</sup> Universidade Federal do Ceará, Fortaleza, CE, Brazil

<sup>cc</sup> Escola de Medicina e Saúde Pública, Salvador, BA, Brazil

<sup>dd</sup> Universidade Federal do Pará, Belém, PA, Brazil

<sup>ee</sup> Universidade Federal do Espírito Santo, Vitória, ES, Brazil

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## ABSTRACT

**Objective:** To analyze quality of life and demographic and clinical variables associated to its impairment in a large Brazilian cohort of patients with spondyloarthritis (SpA).

**Methods:** A common protocol of investigation was applied to 1465 Brazilian patients classified as SpA according to the European Spondyloarthropathies Study Group (ESSG) criteria, attended at 29 reference centers for Rheumatology in Brazil. Clinical and demographic variables were recorded. Quality of life was analyzed through the Ankylosing Spondylitis Quality of Life (ASQoL) questionnaire.

**Results:** The mean ASQoL score was 7.74 (+5.39). When analyzing the specific diseases in the SpA group, the ASQoL scores did not present statistical significance. Demographic data showed worse scores of ASQoL associated with female gender ( $p=0.014$ ) and African-Brazilian ethnicity ( $p<0.001$ ). The analysis of the clinical symptoms showed that buttock pain ( $p=0.032$ ), cervical pain ( $p<0.001$ ) and hip pain ( $p=0.001$ ) were statistically associated with worse scores of ASQoL. Continuous use of nonsteroidal anti-inflammatory drugs ( $p<0.001$ ) and biologic agents ( $p=0.044$ ) were associated with higher scores of ASQoL, while the other medications did not interfere with the ASQoL scores.

**Conclusion:** In this large series of patients with SpA, female gender and African-Brazilian ethnicity, as well as predominant axial symptoms, were associated with impaired quality of life.

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## Qualidade de vida nas espondiloartrites: análise de uma grande coorte brasileira

### RESUMEN

**Objetivo:** Analisar a qualidade de vida e as variáveis demográficas e clínicas associadas à diminuição da capacidade em uma grande coorte brasileira de pacientes com espondiloartrite (EspA).

**Métodos:** Foi aplicado um protocolo de pesquisa único a 1.465 pacientes brasileiros classificados como tendo EspA de acordo com os critérios do European Spondyloarthropathies Study Group (ESSG), atendidos em 29 centros de referência em Reumatologia do Brasil. Foram registradas as variáveis clínicas e demográficas. A qualidade de vida foi analisada por meio do questionário Ankylosing Spondylitis Quality of Life (ASQoL).

**Resultados:** A pontuação média do ASQoL foi de 7,74 (+5,39). Ao analisar doenças específicas no grupo de EspA, as pontuações do ASQoL não apresentaram diferença estatisticamente significativa. Os dados demográficos mostraram piores escores de ASQoL associados ao gênero feminino ( $p=0,014$ ) e etnia afro-brasileira ( $p<0,001$ ). Quanto aos sintomas clínicos, a dor na região glútea ( $p=0,032$ ), a dor cervical ( $p<0,001$ ) e a dor no quadril ( $p=0,001$ ), bem como a presença de articulações periféricas inflamadas ( $p=0,022$ ), estiveram estatisticamente associadas a piores escores no ASQoL. O uso contínuo de fármacos anti-inflamatórios não esteroides ( $p<0,001$ ) e agentes biológicos ( $p=0,044$ ) estiveram associados a escores mais elevados de ASQoL, enquanto outros medicamentos não interferiram nos escores do ASQoL.

### Palavras-chave:

Espondiloartrite

Espondilite anquilosante

Qualidade de vida

ASQoL

Conclusão: Neste grande série de pacientes com EspA, o sexo feminino e a etnia afro-brasileira, bem como alguns sintomas clínicos axiais e periféricos, estiveram associados a uma qualidade de vida reduzida.

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## Introduction

The spondyloarthritides (SpA) comprise a group of interrelated chronic inflammatory diseases, i.e. ankylosing spondylitis (AS), psoriatic arthritis (PsA), SpA associated with inflammatory bowel diseases (IBD), reactive arthritis (ReA), juvenile onset SpA, and undifferentiated SpA. These diseases share several clinical features such as inflammation of the axial joints, asymmetric oligoarthritis (especially of the lower limbs), and enthesitis. AS is a chronic inflammatory disease that affects predominantly the spine and usually starts in the young adult age, contributing to significant physical disability and decreased quality of life (QoL) in a significant number of patients.<sup>1</sup> With the advent of new and effective agents for the treatment of AS in the last decade, it became necessary to develop methods that could reflect the real improvement in the QoL of these patients.

In general, QoL can be measured by two groups of instruments: generic instruments, applicable to patients with various conditions, and disease specific instruments for use in specific diseases.<sup>1</sup> The generic instrument most commonly used to be evaluate QoL in patients with SpA is the Medical Outcome Short-Form 36 Health Survey (SF-36),<sup>2</sup> that measures health-related QoL through 8 domains ("physical functioning", "physical role", "body pain", "general health", "vitality", "social functioning", "emotional role" and "mental health"). In 2003, the Ankylosing Spondylitis Quality of Life (ASQoL),<sup>3</sup> a specific instrument to analyze QoL in AS patients, was proposed; it comprises 18 questions, and the poor QoL is associated with the higher scores. ASQoL was developed in collaboration with AS patients, is feasible and sensitive to change over time.<sup>3</sup> ASQoL has been validated in many countries.<sup>4-6</sup> And as we do not have specific questionnaires related to QoL in other diseases in the SpA group, ASQoL can be used for the evaluation of these SpA patients.

The objective of this study is to analyze the importance of demographic and clinical variables in the QoL in a large Brazilian cohort of patients with spondyloarthritis (SpA).

## Methods

This is a prospective, observational, and multicentric cohort of 1465 consecutive patients with SpA recruited from 29 referral centers participating in the Brazilian Registry of Spondyloarthritis (RBE - *Registro Brasileiro de Espondiloartrites*). All patients, from all the 5 major geographic areas in Brazil, were classified according to the European Spondylarthropathy Study Group criteria,<sup>7</sup> with data collected from June 2006 to December 2009. The RBE is part of the RESPONDIA group comprising 9 Latin American countries (Argentina, Brazil, Costa

Rica, Chile, Ecuador, México, Peru, Uruguay, and Venezuela) and the 2 Iberian Peninsula countries (Spain and Portugal).

A common protocol of investigation was applied to 1465 SpA patients. The diagnosis of AS was considered if the patients fulfilled the New York modified criteria,<sup>8</sup> and as psoriatic arthritis (PsA) in case they fulfilled the Moll and Wright criteria<sup>9</sup>; reactive arthritis (ReA) was considered when asymmetric inflammatory oligoarthritis of lower limbs was present, associated with enthesopathy and/or inflammatory low back pain following enteric or urogenital infections<sup>10</sup>; and enteropathic arthritis when the patient presented inflammatory axial and/or peripheral joint involvement associated with confirmed inflammatory bowel disease (IBD; Crohn's disease or ulcerative colitis).

Demographic and clinical data were collected, including time of disease duration, spinal pain, peripheral joint pain or swelling, tender and swollen joint count, visual analog scale for pain according to the patient (VAS for pain) and disease activity according to patient and physician (patient and physician VAS for disease activity). Peripheral articular involvement was assessed by the 66 tender/swollen joint count. Other clinical variables as dactylitis, uveitis, HLA-B27 were also evaluated, as well as drug use.

Quality of life was evaluated using the ASQoL questionnaire,<sup>3</sup> that comprises 18 questions, each with a dichotomous "yes/no" response, scored "1" and "0", respectively. Total score ranges from 0 to 18, with the higher scores indicating poor quality of life. ASQoL had previously been translated, cross-translated, validated, and culturally adapted to the Brazilian Portuguese language.<sup>11</sup>

## Statistical analysis

Categorical variables were compared by  $\chi^2$  and Fisher's exact test, and continuous variables were compared by ANOVA test. A value of  $p < 0.05$  was considered significant, and  $0.05 > p > 0.10$  was considered a statistical trend.

## Results

A total of 1465 patients were evaluated, comprising 1059 men and 406 women. AS was the most frequent disease in the group (67.6%), followed by PsA (18.8%), USpA (6.8%), ReA (3.4%), and enteropathic arthritis (3.4%). The mean score of ASQoL was  $7.74 \pm 5.39$ . There was no statistical significance comparing the ASQoL mean scores among the different diseases in the SpA group, as shown in [Table 1](#).

The ASQoL mean scores were higher in the female gender ( $p = 0.014$ ), African-Brazilian ethnicity ( $p < 0.001$ ) and in those who practiced no exercises ( $p < 0.001$ ). HLA-B27 and family history did not influenced the ASQoL scores ([Table 2](#)).

**Table 1 – ASQoL scores, according to the SpA.**

	N (%)	ASQoL score		p
		Mean	SD	
AS	67.6	7.93	5.40	0.205
PsA	18.8	7.29	5.38	
USpA	6.8	7.86	5.14	
ReA	3.4	7.48	5.38	
Arthritis – IBD	3.4	6.91	5.13	
TOTAL	100	7.74	5.39	

ASQoL, Ankylosing Spondylitis Quality of Life; AS, ankylosing spondylitis; IBD, inflammatory bowel disease; PsA, psoriatic arthritis; ReA, reactive arthritis; USpA, undifferentiated spondyloarthritis.

**Table 2 – ASQoL scores, according to demographic variables.**

	N (%)	ASQoL score		p
		Mean	SD	
<b>Gender</b>				0.014
Male	72.3	7.53	5.40	
Female	27.7	8.29	5.34	
<b>Race</b>				<0.001
Caucasian	67.4	7.10	5.40	
African-Brazilian	32.6	8.56	5.33	
<b>Exercise</b>				<0.001
Yes	40.8	6.90	5.29	
No	59.2	8.36	5.37	
<b>HLA-B27<sup>a</sup></b>				0.504
Positive	69.0	7.47	5.56	
Negative	31.0	7.77	5.39	
<b>Family history</b>				0.829
Yes	18.0	7.80	5.28	
No	82.0	7.73	5.42	

<sup>a</sup> Data available for 723 patients.

The ASQoL scores were significantly associated with buttock pain ( $p=0.032$ ), cervical pain ( $p<0.001$ ) and hip pain ( $p=0.001$ ) (Table 3). Clinical variables as inflammatory low back pain, enthesitis, dactylitis, upper limb arthritis, lower limb arthritis, uveitis, inflammatory bowel disease, psoriasis, and urethritis did not influence the ASQoL score (Table 2).

Regarding treatment, patients who took NSAID continuously presented higher ASQoL scores ( $p<0.001$ ). The other medications, like corticosteroids, methotrexate, and sulfasalazine did not influence the ASQoL scores. Biologic agents, especially adalimumab, were associated with lower scores of ASQoL ( $p=0.013$ ) (Table 4).

## Discussion

Despite specific instruments to assess QoL cannot be easily applied to other diseases, ASQoL had a good performance in the evaluation of this large series of patients with SpA. Although AS patients presented higher ASQoL scores, there was no statistical significance among the ASQoL scores in the different diseases in the group; the mean ASQoL score

**Table 3 – ASQoL scores, according to clinical variables.**

	N (%)	ASQoL score		p
		Mean	SD	
<b>Low back pain</b>				0.158
Yes	67.6	7.88	5.46	
No	22.4	7.46	5.24	
<b>Buttock pain</b>				0.032
Yes	33.1	8.18	5.66	
No	66.9	7.52	5.24	
<b>Cervical pain</b>				<0.001
Yes	30.8	8.64	5.43	
No	69.2	7.34	5.33	
<b>Hip pain</b>				0.001
Yes	25.1	8.56	5.49	
No	31.0	7.46	5.33	
<b>Arthritis lower limbs</b>				0.105
Yes	48.9	7.97	5.40	
No	51.1	7.52	5.37	
<b>Arthritis upper limbs</b>				0.327
Yes	22.1	8.00	5.39	
No	77.9	7.67	5.39	
<b>Enthesitis</b>				0.950
Yes	27.1	7.73	5.50	
No	72.9	7.75	5.36	
<b>Dactylitis</b>				0.331
Yes	9.1	7.29	5.58	
No	90.9	7.79	5.37	
<b>Uveitis</b>				0.888
Yes	19.1	7.70	5.38	
No	80.9	7.75	5.40	
<b>Psoriasis</b>				0.215
Yes	17.8	7.36	5.36	
No	82.2	7.82	5.40	
<b>IBD</b>				0.151
Yes	4.7	6.70	5.54	
No	95.3	7.79	5.38	
<b>Urethritis</b>				0.622
Yes	4.4	8.08	5.54	
No	95.6	7.73	5.42	

ASQoL, Ankylosing Spondylitis Quality of Life; IBD, inflammatory bowel disease.

( $7.74 \pm 5.39$ ) indicated that the analyzed patients had a significant low quality of life.

Patients with the mixed (axial + peripheral and/or enthesal) articular presentation had higher ASQoL scores, as expected. Interestingly, the enthesal involvement was associated with the highest ASQoL scores, indicating that enthesitis can contribute to a significant decrease in the QoL of the affected patients.

While SpA is more frequent in male Caucasian patients, the ASQoL was worse in female African-Brazilian patients in the present series. These data can confirm that women usually demonstrate greater dissatisfaction with the disease than men. Some studies have analyzed the associated presence of fibromyalgia and AS,<sup>12,13</sup> a clinical situation that can possibly confound the results related to QoL. Another study,

**Table 4 – ASQoL scores, according to treatment.**

	N (%)	ASQoL score		p
		Mean	SD	
<b>NSAID &gt; 50%</b>				
Yes	35.2	8.65	5.22	<0.001
No	64.8	7.25	5.43	
<b>NSAID on demand</b>				
Yes	24.9	7.68	5.22	0.795
No	75.1	7.76	5.45	
<b>Corticosteroids</b>				
Yes	35.4	7.93	5.41	0.324
No	64.6	7.64	5.39	
<b>Methotrexate</b>				
Yes	51.7	7.90	5.32	0.252
No	48.3	7.57	5.47	
<b>Sulfasalazine</b>				
Yes	44.7	8.02	5.41	0.078
No	55.3	7.52	5.37	
<b>Infliximab</b>				
Yes	15.3	7.20	5.49	0.105
No	84.7	7.84	5.37	
<b>Etanercept</b>				
Yes	2.8	9.44	5.82	0.065
No	97.2	7.69	5.37	
<b>Adalimumab</b>				
Yes	2.3	5.70	4.48	0.013
No	97.7	7.79	5.40	

ASQoL, Ankylosing Spondylitis Quality of Life; NSAID, nonsteroidal anti-inflammatory drugs.

conducted in Brazil, evaluating 71 AS patients (45.5% males and 54.5% females), observed that fibromyalgia was more prevalent among women (3.8:1) and may have influenced the higher BASDAI, BASFI and ASQoL scores in the patients with associated fibromyalgia.<sup>14</sup> Anxiety and depression can also be involved in the impairment of QoL in AS patients.<sup>15</sup> Fibromyalgia, as well as specific questionnaires for anxiety and depression were not assessed in the present study.

The referred higher ASQoL scores observed in the African-Brazilians, indicating a lower QoL, can be explained by the genetic background and the influence of socio-economic factors, such as access to health services and access to specific treatments. This aspect deserves further studies addressing specifically the socio-economic profile of our patients with SpA.

The practice of exercise was associated with lower scores of ASQoL, similar to that observed in a Turkish study analyzing 942 AS patients.<sup>16</sup> A recent British study with 612 AS patients showed that smoking has a dose-dependent relationship with increased disease activity, decreased function, and poor quality of life, independent of age, gender, deprivation level, and disease duration.<sup>17</sup>

In a group where a significant number of patients present axial and peripheral articular involvement, the ASQoL scores were significantly higher in those patients presenting buttock pain, cervical pain and hip pain. This can reflect the fact that the ASQoL was developed for patients with AS, a disease where

the axial component represents its core symptoms. It is also important to mention that 18.8% of the studied patients had PsA, a disease with predominant peripheral component and that has a specific QoL instrument, the Psoriatic Arthritis Quality of Life (PsAQoL).<sup>18</sup> However, considering that PsAQoL was not translated and validated to the Brazilian Portuguese at the time of the data collection, and the fact that 10 of the 18 questions of the ASQoL are quite similar to 10 of the 20 questions of the PsAQoL, we understood that ASQoL could be used in that heterogeneous group of SpA patients.

In general, the applicability of ASQoL uses to be very good.<sup>19</sup> A recent study with 522 AS patients from Canada and Australia showed that contextual factors, such as helplessness and employment had an important and independent contribution to health-related QoL, explaining 47% of the ASQoL variance.<sup>20</sup>

The continuous use of NSAID was associated with higher scores of ASQoL, while NSAID use on demand did not contribute to an impairment of ASQoL. It can be associated to the increased pain and functional limitation observed in patients who generally have continuous use of NSAID, contributing to a decreased quality of life in these patients. The use of biologic agents was associated with better QoL, as shown in previous studies.<sup>21,22</sup>

Concluding, this large Brazilian series of patients with SpA showed that female gender and African-Brazilian ethnicity, as well as the mixed (axial + peripheral) clinical presentation, were associated with impaired quality of life.

## Conflicts of interest

Dr. Sampaio-Barros is a recipient of a research grant from Federico Foundation. The other authors declare no conflicts of interest.

## REFERENCES

1. Van der Heijde D, Landewé R. Assessment of disease activity, function and quality of life. In: Weisman MH, Reveille JD, van der Heijde D, editors. *Ankylosing spondylitis and the spondyloarthropathies*. 1st ed. Filadélfia: Mosby Elsevier; 2006. p. 206–13.
2. Ware JE Jr, Sherbourne CD. The MOS 36-item short form health survey (SF-36). I. Conceptual framework and item selection. *Med Care*. 1992;30:473–83.
3. Doward LC, Spoorenberg A, Cook SA, Whalley D, Helliwell PS, Kay LJ, et al. Development of the ASQoL: a quality of life instrument specific to ankylosing spondylitis. *Ann Rheum Dis*. 2003;62:20–6.
4. Almodóvar R, Zarco P, Collantes E, González C, Mulero J, Fernández-Sueiro JL, et al. Relationship between spinal mobility and disease activity, function, quality of life and radiology. A cross-sectional Spanish registry of spondyloarthropathies (REGISPONSER). *Clin Exp Rheumatol*. 2009;27:439–45.
5. Pham T, van der Heijde DM, Pouchot J, Guillemin F. Development and validation of the French ASQoL questionnaire. *Clin Exp Rheumatol*. 2010;28:379–85.
6. Jenks K, Treharne GJ, Garcia J, Stebbings S. The ankylosing spondylitis quality of life questionnaire: validation in a New Zealand cohort. *Int J Rheum Dis*. 2010;13:361–6.

7. Dougados M, van der Linden S, Julin R, Huitfeldt B, Amor B, Calin A, et al. The European Spondyloarthropathy Study Group preliminary criteria for the classification of spondyloarthropathy. *Arthritis Rheum.* 1991;34:1218-27.
8. van der Linden S, Valkenburg HA, Cats A. Evaluation of diagnostic criteria for ankylosing spondylitis. A proposal for modification of the New York criteria. *Arthritis Rheum.* 1984;27:361-8.
9. Moll JMH, Wright V. Psoriatic arthritis. *Semin Arthritis Rheum.* 1973;3:55-78.
10. Kingsley G, Sieper J. Third international workshop on reactive arthritis, 23-26 September 1995, Berlin, Germany. *Ann Rheum Dis.* 1996;55:564-84.
11. Cusmanich KG. Dissertação de Mestrado Validação para a língua portuguesa dos instrumentos de avaliação de índice funcional e índice de atividade de doença em pacientes com espondilite anquilosante. Faculdade de Medicina da Universidade de São Paulo; 2006.
12. Barlow JH, Macey SJ, Struthers GR. Gender, depression, and ankylosing spondylitis. *Arthritis Care Res.* 1993;6:45-51.
13. Aloush A, Ablin J, Reitblat T, Caspi D, Elkayan O. Fibromyalgia in women with ankylosing spondylitis. *Rheumatol Int.* 2007;27:865-8.
14. Azevedo VF, Paiva ES, Felipe LR, Moreira RA. Occurrence of fibromyalgia in patients with ankylosing spondylitis. *Braz J Rheumatol.* 2010;50:646-50.
15. Baysal O, Durmus B, Ersoy Y, Altay Z, Senel K, Nas K, et al. Relationship between psychologic status and disease activity and quality of life in ankylosing spondylitis. *Rheumatol Int.* 2011;31:795-800.
16. Bodur H, Ataman S, Rezvani A, Bugdayci DS, Cevik R, Birtane M, et al. Quality of life and related variables in patients with ankylosing spondylitis. *Qual Life Res.* 2011;20:543-9.
17. Matthey DL, Dawson SR, Healey EL, Packam JC. Relationship between smoking and patient-reported measures of disease outcome in ankylosing spondylitis. *J Rheumatol.* 2011;38:2608-15.
18. McKenna SP, Doward LC, Whalley T, Tennant A, Emery P, Veale DJ. Development of the PsAQoL: a quality of life instrument specific to psoriatic arthritis. *Ann Rheum Dis.* 2004;63:162-9.
19. Zochling J. Measures of symptoms and disease status in ankylosing spondylitis. *Arthritis Care Res.* 2011;63:S47-58.
20. Gordeev VS, Maksymowych WP, Evers SMA, Ament A, Schachna L, Boonen A. Role of contextual factors in health-related quality of life in ankylosing spondylitis. *Ann Rheum Dis.* 2010;69:108-12.
21. Van der Heijde D, Revicki DA, Gooch KL, Wong RL, Kupper H, Harnam N, et al. Physical function, disease activity, and health-related quality of life outcomes after 3 years of adalimumab treatment in patients with ankylosing spondylitis. *Arthritis Res Ther.* 2009;11:R124.
22. Maksymowych WP, Gooch KL, Wong RL, Kupper H, van der Heijde D. Impact of age, sex, physical function, health-related quality of life, and treatment with adalimumab on work status and work productivity of patients with ankylosing spondylitis. *J Rheumatol.* 2010;37:385-92.