



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.2539349>Available online at: <http://www.iajps.com>

Research Article

**ASSESSING HEALTH- RELATED QUALITY OF LIFE (QOL) IN  
RHEUMATOID ARTHRITIS**<sup>1</sup>Mohmad Amin Dar, <sup>1</sup>Mudasir Maqbool, <sup>2</sup>Dr. Sehrish Javed<sup>1</sup>Department of Pharmaceutical Sciences, University of Kashmir, Hazratbal Srinagar-190006, Jammu and Kashmir, India., <sup>2</sup>Women Medical Officer, BHU Warn Sheikhpura**Abstract**

*Quality of life (QoL) has become an important issue in health care, especially in the studies of chronic diseases. It is a concept incorporating all the factors that might impact on an individual's life. WHO defines health as 'a state of complete physical, mental and social well-being, and not merely the absence of disease and infirmity. The quality of life is usually measured using an instrument in the form of a questionnaire. The various issues to consider when attempting to measure quality of life are: 'what questions should be asked, how responses be recorded, when should questions be asked, of whom should questions be asked and who should do the asking'. The questionnaire generally comprises sets of questions or items relating to the various dimensions of quality of life, such as physical, psychological or social. The format of responses may be 'yes/no', a series of ordered categories, or a linear analogue scale. Rheumatoid arthritis is a chronic debilitating disease, which has a detrimental effect on various aspects of life, including physical, psychological and social functioning. The ultimate aim of any therapy for RA should therefore be not only to improve symptoms and functional abilities but also to achieve a better overall quality of life. In order to assess QoL adequately in RA patients, the instrument that is used should be derived from the experiences of the patients themselves, and should be specific to the disease, simple to administer and complete and acceptable to the respondents. The Health Assessment Questionnaire (HAQ), Nottingham Health Profile (NHP), Sickness Impact profile (SIP), and Short Form Health Survey -36 (SF-36) are some of the generic instruments widely used in population studies. In this review, we will briefly look at the various health related questionnaires and scores employed in assessing Health- Related Quality of Life (QoL) in Rheumatoid Arthritis.*

**Corresponding author:****Mohmad Amin Dar,**Department of Pharmaceutical Sciences,  
University of Kashmir, Hazratbal Srinagar-190006,  
Jammu and Kashmir, India.

QR code



Please cite this article in press Mohmad Amin Dar et al., *Assessing Health- Related Quality Of Life (Qol) In Rheumatoid Arthritis.*, Indo Am. J. P. Sci, 2019; 06(01).

**INTRODUCTION:**

Quality of life (QoL) has become an important issue in health care, especially in the studies of chronic diseases. It is a concept incorporating all the factors that might impact on an individual's life. WHO defines health as 'a state of complete physical, mental and social well-being, and not merely the absence of disease and infirmity'? [1] Quality of life is very often referred to in these terms. It is defined as *individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns*. This definition indicates that QoL is a subjective evaluation based upon the respondent's "perceived" quality of life and thus reflects the effects of disease and health interventions on quality of life that cannot be simply evaluated in terms of "health status", "life style", "life satisfaction", "mental state" or "well-being". Thus, the multidimensional nature of QoL must be realized [2]. The quality of life is usually measured using an instrument in the form of a questionnaire. The various issues to consider when attempting to measure quality of life are: 'what questions should be asked, how responses be recorded, when should questions be asked, of whom should questions be asked and who should do the asking' [3]. The questionnaire generally comprises sets of questions or items relating to the various dimensions of quality of life, such as physical, psychological or social. The format of responses may be 'yes/no', a series of ordered categories, or a linear analogue scale. Rheumatoid arthritis is a chronic debilitating disease, which has a detrimental effect on various aspects of life, including physical, psychological and social functioning. The ultimate aim of any therapy for RA should therefore be not only to improve symptoms and functional abilities but also to achieve a better overall quality of life. In order to assess QoL adequately in RA patients, the instrument that is used should be derived from the experiences of the patients themselves, and should be specific to the disease, simple to administer and complete and acceptable to the respondents [4]. Generic quality-of-life instruments measure general aspects of quality of life and are applicable in a wide range of research settings. These are designed to compare health states across a wide range of disease conditions in population studies. The Health Assessment Questionnaire (HAQ), Nottingham Health Profile (NHP), Sickness Impact profile (SIP), and Short Form Health Survey -36 (SF-36) are some of the generic instruments widely used in population studies. These instruments essentially consists of items that has to be applicable to different disease populations, and thus does not take into account for

the specific issues of any particular disease like RA. Non-generic instruments or Disease-specific instruments are relevant for a specific disease population. Disease-specific instruments are more sensitive and reliable to detect relatively small changes in health status or QoL with changes in clinical intervention. The RAQoL questionnaire developed by Whalley *et al.* [5] in 1997 is a valid and reliable measure of QoL specific for RA patients, and it is the most widely accepted instrument for measuring QoL in RA patients. Although assessment of quality of life, particularly in chronic illness, is the key area of research in developed countries, its importance has not been realized that seriously in this part of the world, especially in India. There are not many studies conducted on the assessment of QoL of patients in India. The economic burden of RA is enormous. In its report on the burden of musculoskeletal conditions, the director general of the World Health Organization concluded, that "although the diseases that kill attract much of the public's attention, musculoskeletal or rheumatic diseases are the major cause of morbidity throughout the world, having a substantial influence on health and quality of life, and inflicting an enormous burden of cost on health systems". [6]

**QOL IN RHEUMATOID ARTHRITIS:**

The typical manifestation of RA is a significant limitation in physical function due to chronic joint inflammation. These physical restrictions in turn often lead to psychosocial problems. However, despite the lack of a curative drug, there is no doubt that patients benefit from treatment. As a consequence, traditional outcome parameters such as cure, or death do not adequately reflect the outcome of treatment of progress of RA. In absence of a cure for RA and the use of potentially toxic drugs, quality of life assessment seems to have an important place in clinical settings. Thus, the importance of self-report measurements in assessing treatment outcome in patients with RA has been advocated by many researchers. They suggest that the course of the disease might be more accurately characterized if the traditional assessment of clinical status is complemented by the self-report questionnaires to evaluate the patient's perception of his/her health. Health status is seen as the presence or absence of disease and its consequences, in largely functional terms. Quality of life goes beyond the impairment, disability and handicap continuum by asking what patient's health status prevents them from doing and also about their emotional response to these restrictions. QoL also reflects the influences of the personal, social and economic resources that an individual has, and the way in which these interact

with health status [7]. There have been two main approaches to the assessment of the effects of RA on patient's lives: quantitative and qualitative. The main approach for the assessment of effects of RA on patient's QoL is quantitative which employs scores obtained by RA patients using standardized measures of health status. The Health Assessment Questionnaire "HAQ" is the most widely used measure of functional disability in RA [8,9].

#### **THE HEALTH ASSESSMENT QUESTIONNAIRE (HAQ):**

The Health Assessment Questionnaire (HAQ), introduced in 1980, is among the first Patient Reported Outcome (PRO) instruments designed to represent a model of patient-oriented outcome assessment. The HAQ is based on five patient centered dimensions: disability, pain, medication effects, costs of care, and mortality. Typically, one of two HAQ versions is used: The Full HAQ, which assesses all five dimensions, and the Short or 2-page HAQ, which contains only the HAQ disability index (HAQ-DI) and the HAQ's patient global and pain visual analog scales (VAS). The HAQ-DI and the global and pain VAS (i.e., the short HAQ) have essentially retained their original content since their inception, while the Full HAQ undergoes periodic revision to address issues of contemporary scientific interest [10]. The HAQ-DI has been translated or culturally adapted into more than 60 different languages or dialects [11-18].

The Full HAQ was one of the first instruments deliberately designed to capture prospectively and by protocol the long-term impact of chronic illness. It is generic in nature and was developed initially for use in multiple illnesses so that the impact of different disease processes could be compared, although much of its early work emanated from the rheumatology field. The Short or 2-page HAQ or the HAQ-DI has received the widest attention, most frequent use, and that is most commonly referred to as "the HAQ." The short HAQ permits an expedient assessment of three of the six American College of Rheumatology (ACR) outcome measures for rheumatoid arthritis [19]. It can be self-administered in five minutes and scored in less than one minute.

The HAQ-DI includes items that assess fine movements of the upper extremity, locomotor activities of the lower extremity, and activities that involve both the upper and lower extremities. Standard scoring takes into account the use of aids and devices or assistance from another person. There are 20 items in eight categories that represent a comprehensive set of functional activities: dressing, rising, eating, walking, hygiene, reach, grip, and usual activities [20]. The stem of each item assesses a patient's functional ability using their usual

equipment during the past week. Each category contains at least two specific sub-category questions. For example, under the category "walking", patients are asked about their ability to walk outdoors on flat ground and to climb up five steps. Scoring of the HAQ-DI is modeled after the American Rheumatism Association/ American College of Rheumatology functional classes [21]. For each item, there is a four-level response set that is scored from 0 to 3, with higher scores indicating more disability (0 = without any difficulty; 1 = with some difficulty; 2 = with much difficulty; and 3 = unable to do). To calculate the HAQ-DI, the highest sub-category score determines the value for each category, unless aids or devices are used; there must be responses in at least 6 of the 8 categories or else a HAQ-DI cannot be computed. The category scores are then averaged into an overall HAQ-DI from zero to three. The HAQDI scale has 25 possible values (i.e., 0, 0.125, 0.250, 0.375 ... 3). Scores of 0 to 1 generally represent mild to moderate difficulty, 1 to 2 represent moderate to severe disability, and 2 to 3 indicate severe to very severe disability. The use of aids or devices or physical assistance increases a score of zero or one to a two to more accurately represent underlying disability; scores at a 3 are not modified.

#### **INDIAN HAQ:**

The Indian version of the Health Assessment Questionnaire (HAQ) is based on the 'Modified HAQ or MHAQ' published by Pincus *et al.* It is an abridged version retaining only eight questions out of the original 20 and showed that MHAQ captured the same information as obtained with the somewhat lengthy original questionnaire [22]. It has been validated to take into consideration the culture and life style of Indian population. The Indian HAQ has been validated by modern psychometric analysis, specifically by examining fit of the scale's data to the Rasch measurement model [23]. The Indian HAQ comprises of 12 questions (nine basic and three advanced activities of daily life) based on the standard HAQ format which was found to be relevant to the Indian population [24].

#### **THE RHEUMATOID ARTHRITIS QUALITY OF LIFE QUESTIONNAIRE (RAQOL):**

The RAQoL questionnaire is the most widely accepted disease-specific measure of Health-Related Quality of Life (HRQoL) used worldwide for RA patients. This is the first patient-completed instrument specifically designed for use with RA patients. RAQoL has been validated for measuring the QoL in different populations of patients with RA [25,26]. It has a good reliability and sensitivity to change towards measuring the disease activity and its effect on various aspects of QoL, such as social and

emotional functioning and functional status [4]. The RAQoL consists of 30 questions with binary responses that assess such aspects of RA as moods and emotions, social life, hobbies, everyday tasks, personal and social relationships, and physical contact. Thus, scores vary from 0 (best RA-specific quality of life) to 30 (worst RA-specific quality of life).

The needs-based model is the basis of the disease-specific RAQoL questionnaire. In this model, QoL is defined as the extent to which individuals are able to meet their needs. By concentrating on needs, items are more likely to be relevant to all patients, regardless of age, gender, marital status or employment status. Thus, these have shown greater

relevance to, and acceptance by, patients than functional instruments [5].

#### THE DISEASE ACTIVITY SCORE (DAS 28):

Although, these self-report questionnaires measure the functional ability and other aspects of health status like psychological and social well-being in a RA patient, and have been used extensively in clinical research, including clinical trials, and in routine clinical practice for evaluation and monitoring of individual patients, measures for disease activity are best assessed by the physicians only. The most popular state index for use in RA is the DAS and its modified version DAS28 [27,28] (Table 1).

**Table 1: EULAR response criteria and the disease activity score in rheumatoid arthritis**

DAS or DAS28 attained at endpoint		Change in DAS or DAS28 attained		
		> 1.2	0.6 < $\Delta$ ≤ 1.2	≤ 0.6
'High'	DAS > 3.7      DAS28 > 5.1	Moderate		No
'Moderate'	2.4 < DAS ≤ 3.7      3.2 < DAS28 ≤ 5.1	Moderate	Moderate	
'Low'	DAS ≤ 2.4      DAS28 ≤ 3.2	Good	Moderate	

Calculation of the disease activity scores DAS and DAS28 to assess joint inflammation in rheumatoid arthritis and the response criteria of the European League against Rheumatism

The DAS is a continuous measure reflecting the level of underlying rheumatoid inflammation. It was developed using decisions on DMARD therapy as an external standard of high and low disease activity. The DAS includes information from tender and swollen joint counts, ESR and a patient global rating, with the statistical advantage of having a Gaussian distribution [29]. The DAS28 scores are the most commonly used measure for determining the disease activity. This includes tender joint count (out of 28), swollen joint count (out of 28), physician's and

patient's global assessment of disease activity, pain score and Erythrocyte Sedimentation Rate (ESR). The DAS 28 scores have been found to be valid and reliable in assessing the rheumatoid arthritis disease activity [30-32]. It has become the most extensively used disease activity measure in clinical research as well as clinical practice. Since its development, several modifications have been done taking into consideration the number of joint-counts and the patient's global health assessment (Table 2).

**Table 2: Modified Disease Activity Scores developed by Prevoo et al.**

	Canonical correlation	Disease Activity Scores
DASnew		
With GH	0.81	$0.54 \times \sqrt{RAI} + 0.039 \times TSWOLLEN + 0.72 \times \ln ESR + 0.013 \times GH$
Without GH		$(0.54 \times \sqrt{RAI} + 0.039 \times TSWOLLEN + 0.72 \times \ln ESR) \times 1.08 + 0.14$
DAS28T+S		
With GH	0.82	$0.56 \times \sqrt{28T} + 0.28 \times \sqrt{28S} + 0.70 \times \ln ESR + 0.014 \times GH$
Without GH		$(0.56 \times \sqrt{28T} + 0.28 \times \sqrt{28S} + 0.70 \times \ln ESR) \times 1.08 + 0.16$
DAS28T&S		
With GH	0.81	$0.73 \times \sqrt{28T\&S} + 0.76 \times \ln ESR + 0.016 \times GH$
Without GH		$(0.73 \times \sqrt{28T\&S} + 0.76 \times \ln ESR) \times 1.085 + 0.24$

\* For the development of the scores without GH, the constant was chosen in such a way that the mean difference from the DAS score that includes GH was 0. RAI = Ritchie articular index; TSWOLLEN = total number of swollen joints (of 44); ESR = erythrocyte sedimentation rate; DAS28T+S = DAS with separate 28-joint counts for tender joints and swollen joints; DAS28T&S = DAS with 28-joint

### QOL MEASURES IN CLINICAL PRACTICE:

Quality of life measures have eight potential uses in aiding routine clinical practice. They can be used to prioritize problems, facilitate communication, screen for potential problems, identify preferences, monitor changes or response to treatment, and train new staff [33]. They can also be used in clinical audit and in clinical governance. The first five of these are of immediate value in the clinical encounter, while the last three contribute to training, reviewing care, and improving care in the future [34-36].

#### Identifying and prioritizing problems

Because the measure records information on a range of problems the patient and the doctor or nurse can identify which problems are most important. They can thus agree priorities. This is particularly useful when patients have multiple problems. Additionally, these measures can be used to capture information that superficially seems to have no clinical relevance but might explain disease severity or coping problems [37].

#### Facilitating communication

Because the measure presents clear information on a range of problems it can help patients to communicate their problems. If correctly applied it may speed the clinical encounter and help staff to focus on the patient's main concerns. Awareness that there may be a need to explore doctor-patient communication is suggested by the work of Kwok and Ibrahim who, using a cross-sectional, observational study design with four rheumatologists and 79 of their patients, found that physicians often failed to identify the patients' priorities [38].

#### Screening for hidden problems

Some patient's problems can be overlooked unless specifically inquired about, especially psychological and social problems [55]. For example, a measure that asks, "Would you describe your mood as depressed most of the time," is a sensitive and specific screening tool for depression.

#### Facilitating shared clinical decision making

Used in this way assessments help identify the patient's preferred outcome or treatment goals. If these are not known, then the treatment may not meet the patient's expectations, and this may affect adherence to treatment and the patient's satisfaction with care.

#### Monitoring changes or responses to treatment

Change is usually monitored through laboratory or clinical tests rather than the patient's perception of change. Inability to bring about improvements that are seen as relevant to the patient may affect adherence to treatment [39].

### CONCLUSION:

It can be concluded:

- Using quality of life measures in clinical practice ensures that treatment and evaluations focus on the patient rather than the disease.
- The measures are potentially useful in both the clinical encounter and in quality improvement.
- They are not a substitute for measures of disease outcomes and may not always be the most appropriate patient centered outcome to assess.
- Measures developed for research often cannot easily be used in clinical practice.

- Measures that form an integral part of treatment planning and evaluation are more likely to influence clinical decision making than those that are used only to monitor disease or treatment.

#### REFERENCES:

1. World Health Organization. The constitution of the World Health Organization: *WHO Chron.* 1947; 1:29.
2. WHOQOL Group. Measuring Quality of Life: The development of the World Health Organization Quality of Life Instrument (WHOQOL). Geneva: World Health Organization. 1993.
3. Billingham LJ, Abrams KR, Jones DR. Methods for the assessment of quality-of-life and survival data in health assessment technology. *Health Technol Assess.* 1999;3(10)
4. De Jong Z, Van Der Heijde D, McKenna SP, Whalley D. The reliability and construct validity of the RAQoL: A rheumatoid arthritis specific quality of life instrument. *Br J Rheumatol.*1997; 36:878–83.
5. Walley D, McKenna SP, de Jong Z, van der Heijde D. Quality of life in rheumatoid arthritis. *Br J Rheumatol.*1997; 36:884–8.
6. WHO: Scientific Group on the Burden of Musculoskeletal Conditions at the Start of the New Millennium. *The burden of musculoskeletal conditions at the start of the new millennium: report of a WHO Scientific Group.* Geneva: World Health Organisation. 2003.
7. Guyatt GH, Feeny DH, Patrick DL: Measuring Health- Related Quality of Life: *Annals of Internal Medicine* 1993; 118(8): 622-629.
8. Fries JF, Spitz P, Kraines RG, Holman HR: Measurement of patient outcome in arthritis. *Arthritis Rheum* 1980; 23(2):137-45.
9. Bruce B, Fries JF: The Stanford health assessment questionnaire (HAQ): a review of its history, issues, progress, and documentation. *J Rheumatol* 2003;30(1):167-78
10. Bruce B, Fries JF: The Health Assessment Questionnaire: *Clin Exp Rheumatol* 2005; 23 (Suppl. 39):S14-S18.
11. Pincus T, Swearingen C, Wolfe F. Toward a multidimensional health assessment questionnaire (MDHAQ). *Arthritis Rheum* 1999; 42:2220–30
12. Siegert CEH, Vleming LJ, Vandenbroucke JP, Cats A. Measurement of disability in Dutch rheumatoid arthritis patients. *Clin Rheumatol* 1984; 3:305–9.
13. Kirwan JR, Reeback JS. Stanford Health Assessment Questionnaire modified to assess disability in British patients with rheumatoid arthritis. *Br J Rheumatol* 1986; 25:206–9.
14. Ekdahl C, Eberhardt K, Andersson SI, Svensson B. Assessing disability in patients with rheumatoid arthritis. Use of a Swedish version of the Stanford Health Assessment Questionnaire. *Scand J Rheumatol* 1988; 17:263–71.
15. Guillemin F, Briancon S, Pourel J. Measurement of the functional capacity in rheumatoid arthritis: A French adaptation of the Health Assessment Questionnaire (HAQ): *Rev Rhum Mal Osteoartic* 1991; 58:459–65.
16. Shehab D, Al-Jarallah K, Moussa MAA. Validation of the Arabic version of the health assessment questionnaire (HAQ) in patients with rheumatoid arthritis: *Rev Rhum Eng Ed* 1998; 65:387–92.
17. Thorsen H, Hansen TM, McKenna SP, Sorensen SF, Whalley D. Adaptation into Danish of the Stanford Health Assessment Questionnaire (HAQ) and the Rheumatoid Arthritis Quality of Life Scale (RAQoL): *Scand J Rheumatol* 2001; 30:103–9.
18. Osiri M, Deesomchok U, Tugwell P. Evaluation of functional ability of Thai patients with rheumatoid arthritis by the use of a Thai version of the Health Assessment Questionnaire: *Rheumatology* 2001;40:555–8.
19. Felson DT, Anderson JJ, Boers M *et al*: The American College of Rheumatology preliminary core set of disease activity measures for rheumatoid arthritis clinical trials. The Committee on Outcome Measures in Rheumatoid Arthritis Clinical Trials: *Arthritis Rheum* 1993; 36: 729-40.
20. Bruce B, Fries JF: The Stanford Health Assessment Questionnaire: Dimensions and Practical Applications: *Health and Quality of Life Outcomes* 2003, 1:20; <http://www.hqlo.com/content/1/1/20>
21. Hochberg MC, Chang RW, Dwosh I, Lindsey S, Pincus T, Wolfe F: The American College of Rheumatology 1991 revised criteria for the classification of global functional status in rheumatoid arthritis: *Arthritis Rheum* 1992; 35:498-502.
22. Pincus T, Summey JA, Soraci SA Jr, Wallston KA, Hummon NP. Assessment of patient satisfaction in activities of daily living using a modified Stanford Health Assessment Questionnaire: *Arthritis Rheum*1983;26:1346–53
23. Chogle AR, Mistry KJ, Deo SS: Comparison of the Indian version of Health Assessment Questionnaire Score and Short Form 36 Physical Function Score in rheumatoid arthritis using Rasch analysis: *Indian Journal of Rheumatology*

- 2008; 3(2):52–57.
24. Kumar A, Malaviya AN, Pandhi A, Singh R: Validation of an Indian version of the Health Assessment Questionnaire in patients with rheumatoid arthritis: *Rheumatology* 2002; 41:1457-1459.
  25. Tjhius GJ, de Jong Z, Zwinderman AH et al. The validity of the Rheumatoid Arthritis Quality of Life (RAQoL) questionnaire: *Rheumatology* 2001; 40: 1112–19.
  26. Tammaru M, Strömpl J, Maimets K, Hanson E: The value of the qualitative method for adaptation of a disease-specific quality of life assessment instrument: the case of the Rheumatoid Arthritis Quality of Life Scale (RAQoL) in Estonia: *Health and Quality of Life Outcomes* 2004, 2:69: <http://www.hqlo.com/content/2/1/69>
  27. Heijde DM, van 't Hof MA, van Riel PL, Theunisse LA, Lubberts EW, van Leeuwen MA, van Rijswijk MH, Putte LB: Judging disease activity in clinical practice in rheumatoid arthritis: first step in the development of a disease activity score: *Ann Rheum Dis* 1990; 49:916-920.
  28. Prevoo MLL, van 't Hof MA, Kuper HH, van Leeuwen MA, van de Putte LB, van Riel PL. Modified disease activity scores that include twenty-eight-joint counts: development and validation in a prospective longitudinal study of patients with rheumatoid arthritis: *Arthritis Rheum* 1995; 38:44-8.
  29. Fransen J, van Riel: Outcome measures in inflammatory rheumatic diseases: *Arthritis Research & Therapy* 2009 11:244; <http://arthritis-research.com/content/11/5/244>.
  30. van Gestel AM, Prevoo ML, van 't Hof MA, van Rijswijk MH, Putte LB, van Riel PL: Development and validation of the European League Against Rheumatism response criteria for rheumatoid arthritis: *Arthritis Rheum* 1996; 39:34-40.
  31. Smolen JS, Breedveld FC, Eberl G, et al. Validity and reliability of the twenty-eight-joint count for the assessment of rheumatoid arthritis activity: *Arthritis Rheum* 1995; 38:38-43.
  32. Fransen J, Moens HB, Speyer I, Van Riel PLCM: Effectiveness of systematic monitoring of rheumatoid arthritis disease activity in daily practice: a multicentre, cluster randomized controlled trial: *Ann Rheum Dis* 2005; 64:1294–1298.
  33. Higginson IJ, Carr AJ. Measuring quality of life: Using quality of life measures in the clinical setting: *Br Med J* 2001; 322:1297–300.
  34. Greenwood, M. C., Hakim, A. J., Carson, E., Doyle, D. V. (2006). Touch-screen computer systems in the rheumatology clinic offer a reliable and user-friendly means of collecting quality-of-life and outcome data from patients with rheumatoid arthritis. *Rheumatology (Oxford)* 45: 66-71.
  35. O'Boyle CA, McGee H, Hickey A, O'Malley K, Joyce CRB. Individual quality of life in patients undergoing hip replacement: *Lancet* 1992; 339: 1088-1091.
  36. Ruta DA, Garatt AM: A new approach to the measurement of quality of life. The patient generated index: *Med Care* 1994; 32: 1109-1126.
  37. Stowers K, Hughes RA, Carr AJ. Information exchange between patients and health professionals: consultation styles of rheumatologists and nurse practitioners: *Arthritis Rheum* 1999; 42(suppl): 388S.
  38. Kwok CK, Ibrahim SA: Rheumatology patient and physician concordance with respect to important health and symptom status outcomes: *Arthritis Rheum* 2001; 45:372–7.
  39. Greenwood, M. C., Hakim, A. J., Doyle, D. V. (2006). A simple extension to the Rheumatoid Arthritis Quality of Life Questionnaire (RAQoL) to explore individual patient concerns and monitor group outcome in clinical practice: *Rheumatology (Oxford)* 45: 61-65.