

# Physician–patient agreement at a rheumatology consultation – construction and validation of a consultation assessment instrument

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## ABSTRACT

**Objectives:** After consultations, the physician's perceptions differ from the patient's perceptions concerning illness level, cause and nature of the problem and content of the consultation. Agreement on problems requiring follow-up has been associated with a better outcome.

The primary aim of this study was to build and validate an instrument that assesses physician–patient agreement in the rheumatology consultation. The secondary objective was to assess agreement association with patient's clinical and sociodemographic data. **Materials and Methods:** A ten-item questionnaire – “Consultation Assessment Instrument” (CAI) – was developed for this study to assess physician–patient agreement. Ten physicians and 102 patients diagnosed with an inflammatory joint disease under biological therapy were included. The items were evaluated and the index of proportional agreement for the dichotomized answers “agree” (Ppos) and “disagree” (Pneg) was calculated.

**Results:** Consultation satisfaction was the item with the highest agreement. On the opposite end, the item about the explanation of treatment importance was the item with the lowest agreement between patient and physician. Except for one item, the high level of agreement between patient and physician was due to a higher Ppos. Index of proportional agreement was high for 9 of the 10 items ( $0.816 \leq I_v \leq 0.990$ ). Patients with lower disease activity scores had a more positive experience. A good internal consistency was obtained for both

patient's and physician's questionnaire ( $\alpha = 0.88$  and  $\alpha = 0.80$ , respectively).

**Conclusions:** Both patient and physician showed a positive experience towards rheumatology consultation. Physician–patient agreement was high in the majority of the consultation aspects (mean  $I_v = 0,93$ ). A good internal consistency was obtained for both patient's and physician's questionnaire. CAI may be useful as a mental checklist in daily practice or as an educational tool for training consultation skills.

**Keywords:** Patient satisfaction; Communication; Physician-patient relations; Quality of health care; Questionnaire Design; Survey Methodology

## INTRODUCTION

Understanding the disease and the risks and benefits of its treatment rely on good communication between patients and physicians<sup>1</sup>. It is also an important component in developing and maintaining a relationship that involves support, empathy, understanding, good collaboration, and patient-centered interviewing, all of which can enhance treatment adherence<sup>1</sup>. Physician–patient communication and a collaborative stance between the two appears to be important in rheumatology care<sup>2</sup>. Also, agreement on problems requiring follow-up was associated with a better outcome<sup>3</sup>. Lack of agreement between the patient's and the physician's diagnosis was associated with a “negative medical consultation”<sup>3</sup>. If there is lack of concordance and trust in the physician, the likelihood of the patient being non-adherent to the medication is high, increasing the risk for poor disease activity control<sup>1</sup>. Significant discordance between the patient and the physician has been described in multiple rheumatic diseases, including

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rheumatoid arthritis (RA), systemic lupus erythematosus (SLE), ankylosing spondylitis (AS), systemic sclerosis (SS) and psoriatic arthritis (PsA)<sup>4</sup>. Further knowledge of agreement between physician and patient might improve the consultation itself and enhance patient outcomes<sup>5</sup>.

Most validated questionnaires exclusively address the patient's perspective. We found only one validated questionnaire addressing physician–patient agreement<sup>5</sup>. The primary aim of this study was to build and validate an instrument that assesses physician–patient agreement in the rheumatology consultation. The secondary objective was to assess agreement association with patient's clinical and sociodemographic data.

## METHODS

An observational, cross-sectional study was conducted.

### PARTICIPANTS

Participants from two rheumatology centers were consecutively recruited by their rheumatologists during routine clinical practice outpatient visits performed between May and September 2018. Patients above 18 years old, with an established diagnosis of inflammatory joint disease under biological therapy were included. Patients with cognitive impairment or dementia and those who did not speak Portuguese were excluded.

Firstly, written informed consent was obtained, and then an anonymous questionnaire was filled by the patients and physicians. Patients and physicians responsible for the consultation filled the questionnaire sequentially and independently. Patients' and physicians' questionnaires were then grouped by a research nurse. Clinical data were collected afterwards and independently by separate teams. Sociodemographic (age, gender, marital status, educational level, employment status) and clinical data [diagnosis, treatment, inflammatory parameters, disease activity (28-joint Disease Activity four variables Score (DAS28 4v), Ankylosing Spondylitis Disease Activity Score with C Reactive Protein (ASDAS CRP) and Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) scores), disability status (Bath Ankylosing Spondylitis Functional Index (BASFI) and Health Assessment Questionnaire (HAQ)) and Patient global assessment (PGA)] were collected.

Patient's data collection was done by at least two in-

dependent investigators, and statistical analysis was performed by independent investigators.

### QUESTIONNAIRE

A questionnaire was developed for this study with the aim of assessing physician-patient agreement in rheumatology consultation (see supplementary material). Questions were formulated based on the most relevant aspects of the consultation, according to the literature<sup>5-9</sup>. Two questionnaire versions were made – one patient version and one physician version. The questionnaire was validated by a rheumatologists team and then applied to a patient's pilot group (n=8) to assess its relevance and text comprehension. Finally, a ten-item instrument was obtained and named “Consultation Assessment Instrument” (CAI). Each item was rated on a Likert scale of 1 to 4, with a total score of 40 points. The higher the total score obtained, the more positive the consultation experience.

### STATISTICAL METHODS

The four-grade scale was dichotomized as “disagree” (response 1 to 2) or “agree” (response 3 to 4) with the statement. Using this dichotomized scale, each item was then analyzed according to the level of agreement between physician and patient with the omnibus indexes of validity (Iv) and kappa coefficient (k). The more specific indexes of proportional agreement for the two responses “agree” (Ppos) and “disagree” (Pneg) were calculated. Ppos is the number of consultations where physicians and patients both state that they agree (response 3 to 4) with the statement compared to the number of consultations where physicians or patients state that they agree with the statement. An item was considered useful if Ppos or Pneg was at least 0,85. Mathematical formulas used are presented in figures<sup>1-3</sup>.

Internal criterion validation was done by Ppos and Pneg for the validation between physician and patient and Cronbach's Alpha test for validation within physician and within patient. Cronbach's alpha reliability coefficient normally ranges between 0 and 1<sup>10</sup>. The closer Cronbach's alpha coefficient is to 1, the greater the internal consistency of the items in the scale<sup>10</sup>. This coefficient classifies internal consistency as excellent ( $\alpha > 0.9$ ), good ( $\alpha > 0.8$ ), acceptable ( $\alpha > 0.7$ ), questionable ( $\alpha > 0.6$ ), poor ( $\alpha \geq 0.5$ ) and unacceptable ( $< 0.5$ )<sup>10</sup>.

Categorical variables are presented as frequencies and percentages, and continuous variables as means and standard deviations, or medians and interquartile

		Rater 2		total
		+	-	
Rater 1	+	a	b	a + b
	-	c	d	c + d
total		a + c	d + d	N

**FIGURE 1.** Summary of binary ratings by two raters (in this case, rater 1 is the patient and rater 2 is the physician)

$$\frac{a + d}{a + d + c + d} = \frac{a + d}{N}$$

**FIGURE 2.** Index of validity formula

$$PA = \frac{2a}{2a + b + c}; \quad NA = \frac{2d}{2d + b + c}$$

**FIGURE 3.** Positive agreement (PA) and Negative agreement (NA) formula

ranges for variables with skewed distributions. Pearson's correlation coefficient was used to assess the correlation between CAI score and patients' satisfaction, and disease activity (DAS28 4v, BASDAI, ASDAS CRP) and function scores (HAQ and BASFI). The value of r 0.0-0.19 was accepted as very weak, 0.2-0.39 as weak, 0.4-0.59 as moderate, 0.6-0.79 as strong, and 0.80-1.0 as very strong<sup>11</sup>. An independent T-test was used to evaluate differences in CAI score within gender, and also to evaluate differences in agreement within disease activity scores, function and satisfaction. The one-way analysis of variance (ANOVA) was used to determine associations between CAI score and disease activity (DAS28 4v and ASDAS CRP categories). All reported p-values were two-tailed, with a 0.05 significance level ( $\alpha$ ). Data analysis was carried out using Statistical Package for the Social Sciences (SPSS) software, version 23.

## RESULTS

### SOCIODEMOGRAPHIC AND CLINICAL DATA

A total of 102 observations were obtained, corresponding to 10 physicians and 102 patients. The sociode-

mographic and clinical characteristics of rheumatic patients are shown in Table I and Table II, respectively. In the overall sample, most patients were female (53.9%), with high school educational level (47.1%) and employed (45.1%), with a mean age of 51.5 ± 12.7 years old. RA was the most prevalent diagnosis (40.2%) and more than half of patients were categorized in disease remission (42.0% by DAS28 4v and 63.0% by ASDAS CRP). Etanercept was the most frequent biologic treatment. Table II shows diagnostic and treatment data. Mean physician age was 37.9 ± 12.9 years old, with 97% females and mean duration of clinical practice was 13.1 ± 12.9 years.

### CONSULTATION ASSESSMENT INSTRUMENT (CAI) VALIDATION PROCESS

An item was considered useful if Ppos or Pneg was at least 0.85. Ninety percent of the items were adequate for assessing agreement. Only item 5 obtained a Ppos value under 0.85 (Ppos = 0.82). Even though, authors are convinced that a 0.03 difference could not overcome the relevance of the item (related to the importance of treatment perception), and it was not removed from the instrument.

Internal consistency assessed by Cronbach's Alpha was good for all the items, with an  $\alpha = 0.88$  for patients'

**TABLE I. SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PATIENTS**

Gender	n (%)
Female	55 (53.9%)
Male	47 (46.1%)
Age in years (mean ± SD)	51.5 ± 12.7
Marital Status	n (%)
Single	17 (16.7%)
Divorced	6 (5.9%)
Married	75 (73.5%)
Widow	4 (3.9%)
Education Level	
Illiteracy	2 (2.0%)
Primary school	38 (37.3%)
High school	48 (47.1%)
University	14 (13.7%)
Employment status	
Unemployed	11 (10.8%)
Medical Leave	2 (2.0%)
Employed	46 (45.1%)
Retired	31 (30.4%)
Student	4 (3.9%)
Other	8 (7.8%)

**TABLE II. CLINICAL CHARACTERISTICS OF PATIENTS**

	n (%)
Biologic treatment	
Etanercept	40 (39.2%)
Adalimumab	16 (15.7%)
Golimumab	16 (15.7%)
Infliximab	12 (11.8%)
Tocilizumab	8 (7.8%)
Rituximab	6 (5.9%)
Secukinumab	2 (2.0%)
Ustekinumab	1 (1.0%)
Certolizumab	1 (1.0%)
Diagnosis	
Rheumatoid Arthritis	41 (40.2%)
Psoriatic Arthritis	24 (23.5%)
Axial Spondyloarthritis	27 (26.5%)
Juvenile Idiopathic Arthritis	5 (4.9%)
Spondyloarthritis IBD	4 (3.9%)
Seronegative Polyarthritis	1 (1.0%)
Disease Activity (DAS28 4v score)	
Remission ( $\leq 2.6$ )	28 (42.4%)
Low disease activity ( $> 2.6$ to $\leq 3.2$ )	9 (13.6%)
Moderate disease activity ( $> 3.2$ to $\leq 5.1$ )	24 (36.3%)
High disease activity ( $>5,1$ )	5 (7.6%)
Disease Activity (ASDAS PCR)	
$< 2.1$	22 (67.4%)
$\geq 2.1$	12 (35.3%)

The DAS28 4v score was used to assess disease activity in rheumatoid arthritis patients and spondyloarthritis patients with predominantly peripheral joint involvement; the ASDAS PCR was used to assess disease activity in axial spondyloarthritis.

Spondyloarthritis IBD - Spondyloarthritis associated with inflammatory bowel disease; DAS28 4v - 28-joint Disease Activity Score four variables; ASDAS PCR - Ankylosing Spondylitis Disease Activity Score

questionnaire version and 0.80 for physician's questionnaire version.

#### CONSULTATION ASSESSMENT INSTRUMENT (CAI) AND ITS ASSOCIATION WITH CLINICAL AND SOCIODEMOGRAPHIC DATA

Patients and physicians had a mean CAI score of  $34.3 \pm 5.05$  and  $32.9 \pm 3.69$ , respectively. There were no gender differences in either group ( $p=0.31$  and  $p=0.14$ , respectively). Higher CAI score correlated with lower BASDAI score ( $r=-0.38$ ;  $p=0.02$ ). Also, disease activity evaluated by DAS28 4v associated with CAI score (low disease activity = 37.0; moderate disease activity = 35.8; high disease activity = 35;  $p=0.04$ ). There was no sta-

tistically significant association between CAI total score and HAQ, ASDAS CRP or BASFI scores. It was also found that the more satisfied the patient (item 10), the lower the BASFI ( $r=-0,334$ ;  $p<0.04$ ) and ASDAS CRP scores (low disease activity = 35.3; high disease activity = 30.5;  $p=0.001$ ). Patient's satisfaction did not show an association with DAS28 4v, HAQ and BASDAI scores.

#### PHYSICIAN-PATIENT AGREEMENT

Physician-patient agreement was high in 9 of the 10 items according to index of validity. Thus, index of validity was in general high for each item (Table III). Due to an imbalance in responses to statements according to "agree" or "disagree", kappa was low. The more useful proportional indexes show that item 5 is of limited value, while the other items are more useful (Table III). The highest agreement was obtained for item 10 and the lowest for item 5. With the exception of item 6, physician-patient agreement was due to statement agreement ( $P_{pos} > P_{neg}$ ). There were no differences in physician-patient agreement between genders ( $p=0.670$ ) or different diagnosis ( $p=0.890$ ). There was no statistically significant association between physician-patient agreement and disease activity, disability scores or patient satisfaction.

#### DISCUSSION

In this study, both physician and patient obtained high CAI scores. Also, patients with a better consultation experience, assessed by total CAI score, and more satisfied patients had lower levels of disease activity. However, in a study of 2007, patient's satisfaction with treatment only weakly associated with RA activity<sup>12</sup>. Patient's satisfaction with care has been found to correlate with higher rates of adherence, thereby yielding it an essential role in improving the outcome<sup>2</sup>.

Assessing patient satisfaction with closed-ended questions and a graded scale often lead to high scores – patients tend to be very positive<sup>13</sup>. Thus, questionnaires where patients are asked to grade physicians in closed-ended questions almost always yield positive responses. In this study, physician responses tended to resemble patient responses with very few negative responses. Physician-patient agreement was high despite low kappa values. Prerequisites for high kappa are good agreement, often measured by the index of validity and a fairly even distribution between positive versus negative responses<sup>13</sup>. Kappa is affected by prevalence of the

**TABLE III. PHYSICIAN-PATIENT AGREEMENT**

Item	I <sub>v</sub>	P <sub>pos</sub>	P <sub>neg</sub>
1 (seating before consultation)	0.989	0.994	0
2 (global well-being)	0.971	0.985	0
3 (understandable speech)	0.980	0.990	0
4 (saying the truth)	0.971	0.985	0
5 (treatment role in disease control)	0.700	0.821	0.063
6 (physician's phone use)	0.816	0	0.899
7 (concerns about disease)	0.907	0.951	0.182
8 (being carefully listened)	0.980	0.99	0
9 (consultation duration)	0.970	0.958	0
10 (patient's satisfaction)	0.990	0.995	0

Note: The four-grade scale was dichotomized as “disagree” (response 1 to 2) or “agree” (response 3 to 4) with the statement. Using this dichotomized scale, each item was then analyzed according to the level of agreement between physician and patient with the omnibus indexes of validity (I<sub>v</sub>) and kappa coefficient. The more specific indexes of proportional agreement for the two responses “agree” (P<sub>pos</sub>) and “disagree” (P<sub>neg</sub>) were calculated.

finding under consideration much like predictive values are affected by the prevalence of the condition under consideration<sup>14</sup>. For marginal findings, very low values of kappa may not necessarily reflect low rates of overall agreement<sup>14</sup>. Thus, it can be predicted that kappa in studies comparing patient and physician attitude towards the consultation will be very low. The solution is to use proportional indexes rather than kappa<sup>15</sup>. However, this implies that the ordinal Likert scale should be rearranged to a dichotomized scale.

Despite the high agreement level obtained in the present work, other studies show that doctors' perceptions of patients' problems differed from those of patients expressed both before and after their consultation<sup>12</sup>. This discordance seems higher in the identification of psychosocial problems<sup>16</sup>.

This study has some potential limitations. Firstly, our sample is quite small and would be advisable to collect data from larger samples. We also know that questionnaires where patients are asked to grade physicians in closed-ended questions almost always yield positive responses. The fact that we only included a very specific group of patients (under biologic treatment) could be an important limitation, since these patients are probably more prone to health education strategies than patients on other classes of treatment.

## CONCLUSIONS

Both patient and physician tend to show a positive experience towards rheumatology consultation. Patients

with a more positive experience had lower disease activity scores. Physician–patient agreement was high in the majority of the consultation aspects. The physician version of CAI could be used for educational purposes on all levels of training, because it might help to improve consultation skills. Another way of using the physician version of CAI would be as a mental checklist for daily practice.

Although developed in the rheumatology setting, CAI items are not specific for a rheumatology consultation, but rather applicable to any consultation in general. Thus, the matched physician–patient version of CAI could be used in future research to help enlighten physician–patient agreement in other settings and improve health caregiving.

## COMPLIANCE WITH ETHICAL STANDARDS

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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## SUPPLEMENTARY FILE

### PATIENT'S QUESTIONS

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- 1 When I walked into the office, the doctor ask me to sit down
- 2 In addition to asking about my illness, the doctor asked me about my overall well-being
- 3 The doctor uses clear, easy-to-understand words and terms
- 4 I answered doctor's questions with the truth
- 5 The doctor explained me the importance of my treatment in control disease
- 6 The doctor answered his phone during the consultation
- 7 I explained the doctor my main concerns about my disease
- 8 The doctor listened to me carefully
- 9 The duration of the consultation was sufficient
- 10 I was very pleased with the consultation

### PHYSICIAN'S QUESTIONS

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- 1 When the patient entered the office, I asked him to sit down
- 2 In addition to questioning his illness, I asked the patient about his general well-being
- 3 I use clear words that are easy to understand
- 4 The patient answered my questions the truth
- 5 I explained the patient the importance of their treatment in controlling their illness
- 6 I answered my phone during the consultation
- 7 The patient explained me his main concerns about his illness
- 8 I listened carefully to what the patient told me
- 9 The duration of the consultation was sufficient
- 10 The patient was very pleased with the consultation