Test-Retest Reliability of the 5-Item Compliance Questionnaire Rheumatology and Factors Influencing its Assessment of Adherence in Patients with Rheumatoid Arthritis

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ABSTRACT

Background/Purpose: Adherence to disease modifying anti-rheumatic drug (DMARD) therapy is suboptimal in patients with rheumatoid arthritis (RA). Efficient, low-cost measures are required for optimal monitoring of medication adherence in the rheumatology clinic. Self-report tools are the most efficient and cost-effective measures available. Recently, a 5-item version of the Compliance Questionnaire Rheumatology (CQR5) was developed from the original 19-item version to reduce patient burden[1]. Reliability of CQR5 over time has not been evaluated, nor has its association with other factors that can impact medication taking. In a sample of RA patients, we investigated 1) test-retest reliability of CQR5 and 2) correlation of CQR5 with psychosocial and physical factors known to influence adherence.

Methods: RA patients (disease duration ≥ 1 y) taking at least one DMARD were randomly selected from a rheumatology clinic database. Patients were assessed at baseline and 2 weeks. Demographic data were collected at baseline. At each visit, medication adherence was assessed with CQR5. Each item on the CQR5 was scored on a 4-point Likert scale (1 = strongly disagree, 4 = strongly agree). Scores for each item were summed into a total score which varied between 0 and 20. Higher scores indicated greater adherence. Psychosocial measures were evaluated using 1) Beliefs about Medicines Questionnaire (BMQ)[2], which examines beliefs around necessity of and concern with taking medications (high scores reflect strong beliefs) and 2) RA Self-Efficacy Questionnaire (RASE)[3] (high scores reflect high self-efficacy). Physical factors were assessed using 1) multi-dimensional HAQ (MDHAQ)[4] (high numbers indicate poor general health and worse symptoms) and 2) disease activity measured by the Composite Disease Activity Index (CDAI)[5] (high scores indicate high disease activity). Intraclass correlation coefficients (ICC) were used to evaluate test-retest reliability of CQR5 scores measured at baseline and 2 weeks. Bivariate correlations (Pearson's r) were performed to determine relationships between psychosocial factors and medication adherence measured by CQR5 at baseline.

Results: 100 RA patients, [age, mean (SD)= 60.75 (12.67) y], were recruited. In this sample, the CQR5 demonstrated excellent test-retest reliability (ICC = 0.78). Adherence measured by CQR5 had a strong positive correlation with BMQ necessity scores (r = 0.64, p < 0.001) and a weak negative correlation with BMQ concerns scores (r = -0.22, p < 0.05). Correlations between the CQR5 and RASE, MDHAQ, and CDAI were negligible (r < 0.17, p > 0.05).

Conclusion: The CQR5 demonstrates excellent reliability over time. Adherence measured by the CQR5 is associated with beliefs about medicines, especially around the necessity of taking medications. A more in-depth investigation of the CQR5, including its validation against a gold standard for measuring medication adherence, is currently underway.

BACKGROUND AND OBJECTIVES

Background

- Adherence is the extent to which a patient's behaviour coincides with medical or health advice.
- Medication adherence is defined as the extent to which a patient takes medication as prescribed by their health care providers. Non-adherence has potential negative effects on patient prognosis[5].
- Measurement of medication adherence is essential in clinical practice and research on patient outcomes.
- Effective, easy to use, inexpensive medication adherence measures are needed.
- Several self-report questionnaires have been used to measure medication adherence in rheumatology
- Only the 19-item Compliance Questionnaire on Rheumatology (CQR)[6] has been validated for use in rheumatology[7].
- A 5-item version of the CQR (CQR5) was recently developed to ease patient burden and was validated in a group of patients with rheumatoid arthritis (RA)[1].
- Reliability of the CQR5 has not yet been determined, nor has it been evaluated against physical and psychosocial factors known to influence medication adherence.

Objectives

1. Evaluate test-retest reliability of the CQR5 in patients with RA and
2. Correlate measurements taken with the CQR5 against selected physical and behavioural measures.

METHODS

Participants

- Adults (18-80 y) with RA on DMARD therapy
- Randomly selected

Design and Procedure

- Cross-sectional design
- Two different time points – baseline (T0), two weeks post-baseline (T1)
- Demographics and disease activity only at T0

Demographics – Age, gender, disease duration, education, language spoken at home

Outcome Measure

CQR5[1]

The following questions are about how you take the medications for your arthritis. Please read the statements and tick the box which best describes the way you take your medications. Think about how you have taken your medications in the past month.

CQR5 Score Range = 5 to 20				
Please check one box for each item.	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
A.	I take my anti-rheumatic medicines because I then have fewer problems				
B.	I definitely don't dare to miss my anti-rheumatic medications				
C.	My medicines are always stored in the same place and that's why I don't forget them				
D.	I take my medications because I have complete confidence in my rheumatologist				
E.	What the doctor tells me, I hang on to				

Beliefs About Medicines Questionnaire (BMQ)[2]

We would like to ask you about your personal views about medications prescribed to you. These are statements other people have made about their medicines.

Part I: Your views about the medicines prescribed for your rheumatoid arthritis

BMQ Necessity Score Range = 5 to 25					
BMQ Concerns Score Range = 5 to 25					
Please check one box for each item	Strongly Disagree (1)	Disagree (2)	Uncertain (3)	Agree (4)	Strongly Agree (5)
A.	My health, at present, depends on medicines					
B.	Having to take medicines worries me					
C.	My life would be impossible without medicines					
D.	Without medicines I am very ill					
E.	I sometimes worry about the long-term effects of my medicines					
F.	My medicines are a mystery to me					
G.	My health in the future will depend on medicines					
H.	Doctors use too many medicines					
I.	I sometimes worry about becoming too dependent on my medicines					
J.	My medicines protect me from becoming worse					

Part II: Your views about medicines in general

BMQ Overuse Score Range = 4 to 20					
BMQ Harm Score Range = 4 to 20					
Please check one box for each item	Strongly Disagree (1)	Disagree (2)	Uncertain (3)	Agree (4)	Strongly Agree (5)
A.	Doctors use too many medicines					
B.	People who take medicines should stop their treatment for a while every now and again					
C.	Most medicines are addictive					
D.	Natural remedies are safer than medicines					
E.	Medicines do more harm than good					
F.	All medicines are poisons					
G.	Doctors place too much trust on medicines					
H.	If doctors had more time with patients they would prescribe fewer medicines					

Statistical Analyses

SPSS Statistics 22

- Test-retest reliability of CQR5:
  - Intraclass correlation coefficient (ICC)
  - Mean differences (Bland-Altman method)
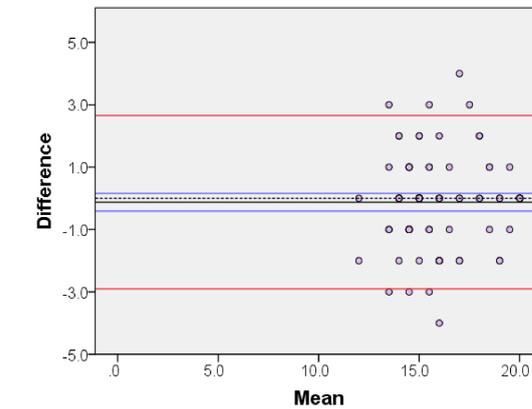- Pearson correlations

RESULTS

Participants

100 adult RA patients. Majority between 18 and 64 y (54%), female (84%), disease duration > 5 y (66%), had at least some post-secondary education (78%) and spoke English at home (99%).

Reliability Analysis

Table 1: Single measures ICC for CQR5. After T0, four patients dropped out and sample size was reduced to 96 at T1. CQR5 demonstrated excellent reliability according to Fleiss criteria[8].

ICC	0.78
Confidence Interval	Lower Bound — 0.69
	Upper Bound — 0.85
F Test	Value — 8.196
	df1 — 95
	df2 — 95
	Significance — p < 0.001

Figure 1: Bland-Altman plot showing difference between T0 and T1 CQR5 scores against mean of T0 and T1 CQR5 scores for each patient in the study. The confidence coefficient for n = 100 and confidence level of 95% (t = 1.984) were used to construct confidence intervals (blue solid lines) and limits of agreement (red solid lines) around mean difference (black solid line). Mean difference was not significantly different from zero (one sample t-test, p > 0.05), no evidence of proportional bias (β = 0.052, p > 0.05).

Pearson Correlations

Correlation with CQR5 scores was strong for BMQ Necessity scores, weak to moderate for BMQ Concerns and Overuse scores, and moderate for BMQ Harms scores (Figures 2-5). Correlations were negligible and insignificant between CQR5 scores and scores from the MD-HAQ, RASE and CDAI (r < 0.17, p > 0.05).

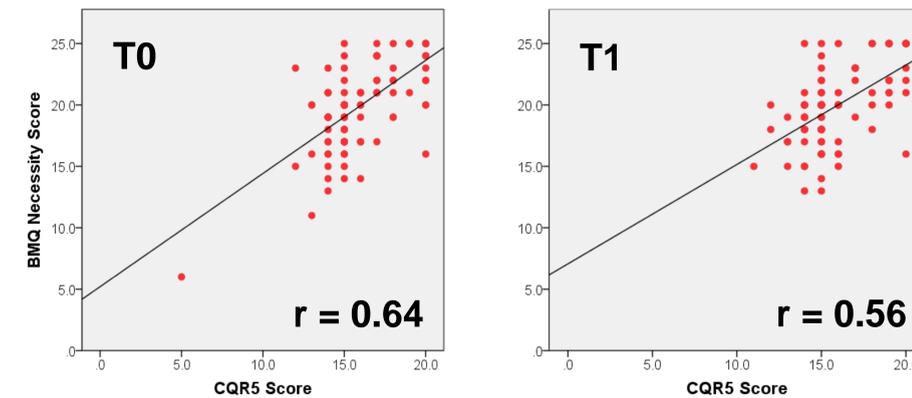**Figure 2:** BMQ Necessity scores at T0 (r = 0.64, p < 0.01, n = 100) and T1 (r = 0.56, p < 0.01, n = 96).

Figure 3: BMQ Concerns scores at T0 (r = -0.22, p < 0.01, n = 100) and T1 (r = -0.33, p < 0.02, n = 96).
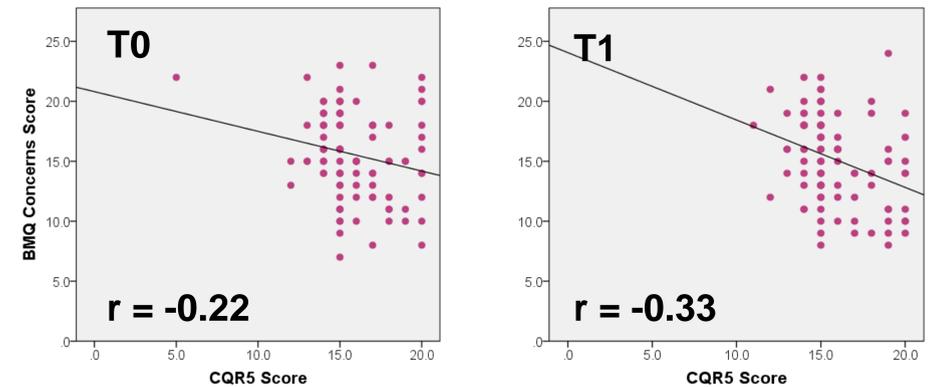
Figure 4: BMQ Overuse scores at T0 (r = -0.31, p < 0.01, n = 100) and T1 (r = -0.24, p < 0.02, n = 96).

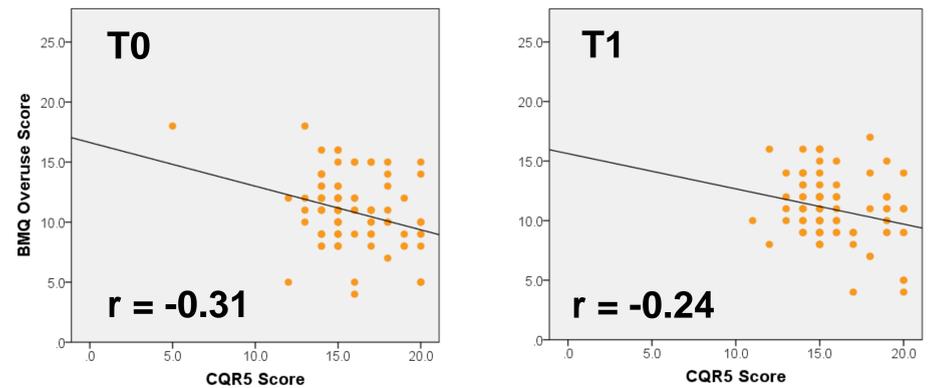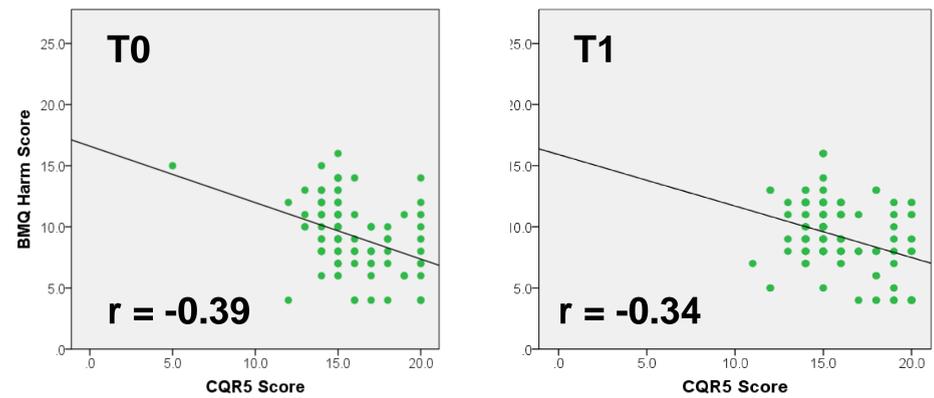**Figure 5:** BMQ Overuse scores at T0 (r = -0.39, p < 0.01, n = 100) and T1 (r = -0.34, p < 0.01, n = 96).

LIMITATIONS & CONCLUSIONS

Limitations: Sample was obtained from a site located in an area of high socioeconomic status and a high level of education prevailed.

Conclusions: CQR5 demonstrated excellent reliability in RA patients (disease duration ≥ 1 y) and correlated well with medication beliefs. An evaluation of how the CQR5 compares to a gold standard in measuring medication adherence is currently underway. Correlation with medication beliefs needs to be re-evaluated in a sample of patients with lower levels of education.

ACKNOWLEDGEMENTS

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