Validity, responsiveness and feasibility of an Italian version of the Canadian Occupational Performance Measure for patients with ankylosing spondylitis

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Abstract

Objective

The purpose of the present study was to produce an Italian version of the Canadian Occupational Performance Measure (COPM) in a group of patients with Ankylosing Spondylitis (AS) and examine the psychometric properties of this version, evaluating its internal consistency, external validity and reliability. Responsiveness and feasibility were also taken into account.

Methods

The Italian COPM, the Italian version of the COPM, was administered to 30 Caucasian patients affected by AS (24 males, 6 females, median age 48 yrs, range 32-67, median disease duration 14 yrs, range 1-30 yrs) together with the Bath Ankylosing Spondylitis Functional Index (BASFI), the Bath Ankylosing Spondylitis Disease Activity (BASDAI) and the Italian version of the Health Assessment Questionnaire (HAQ). Internal consistency was evaluated with Cronbach’s alpha for reliability. Construct validity of the COPM was evaluated by a correlation between the BASFI, BASDAI and HAQ scores. Test-retest reliability was assessed by the Intraclass correlation coefficient. Responsiveness and feasibility were also considered.

Results

All patients completed the validation study. The questionnaire was internally consistent (alpha coefficient=0.774). A significant correlation was recorded between the COPM and the BASFI (rho=-0.566, p<0.01), BASDAI (rho=-0.491, p<0.01). Test-retest reliability showed a good correlation coefficient and it was confirmed by Bland-Altman method.

Conclusion

The Italian COPM is a valid and reliable instrument focused to detect change in a client’s perception of occupational performance over time, in AS patients. Our results confirm the utility of this questionnaire to measure outcome and in planning treatment intervention for patients with AS.

Key words

Ankylosing spondylitis, Italian version, Canadian Occupational Performance Measure, validation, disability, occupational therapy.
Introduction
Ankylosing spondylitis (AS) is a chronic inflammatory disease which may progress to bony ankylosing of the entire spine. It requires a combination of pharmacological therapy and rehabilitation programmes.

Many valid AS specific instruments to evaluate activity, function and disability were successfully developed in the last decades, such as the Bath Ankylosing Spondylitis Functional Index (BASFI), the Bath Ankylosing Spondylitis Metrology Index (BASMI), and the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) (1-4).

More recently, the role of the patient’s participation in the treatment and rehabilitation process have been considered since a chronic disease condition may cause some limitations in performing activities in daily life. Therefore, even in rheumatic chronic diseases it would be ideal to amplify the tools for detecting the patient’s needs within a range of occupations, to know which of these problems cause greatest concern and to measure how they experience and rate their performance of these activities.

The Canadian Occupational Performance Measure (COPM) was originally designed as a means of implementing national consensus guidelines for the practice of occupational therapy in Canada. The conceptual basis for the COPM derives from the Canadian Model of Occupational Performance. This is a generic questionnaire based on a semi-structured interview. The semi-structured design enables individuals to identify any activity of importance that they find difficult to perform (5). The conceptual basis for the COPM is derived from the Canadian Model of Occupational Performance which defines occupational performance as the ability to choose, organise and perform meaningful occupations that are culturally defined and age-appropriate for looking after one’s self, enjoying life and contributing to the social and economic fabric of a community (6).

The COPM is not just an outcome measure: it is a helpful tool to identify problem areas within self-care, productivity and leisure as well as for goal setting and planning of intervention. It has been translated into many languages (7, 8) and validated for patients with osteoarthritis (8), rheumatoid arthritis (9) and AS (10). In particular, the Norwegian version of the COPM was tested for validity, responsiveness and feasibility in a group of patients with osteoarthritis and the results showed that the COPM was a valid and responsive instrument for use in clinical practice (8). Later, the Norwegian version of the COPM was tested to measure the reliability in a group of patients with AS and the results confirmed that the COPM was a reliable instrument for use in clinical practice in patients with AS, and may serve as an instrument to promote a patient-centered approach in the planning and evaluation of rehabilitation programmes (10).

The purpose of the present study was to produce an Italian version of the COPM and, according to the Outcome Measures in Rheumatology Clinical Trials (OMERACT) filter (11), examine the psychometric properties of this version by a) construct validity, b) internal consistency, c) external validity, d) reliability, e) responsiveness and f) feasibility.

Materials and methods
Patients
This validity study was designed and carried out as single-centre, enrolling 30 consecutive patients affected by AS (24 males, 6 females, median age 48 yrs, range 32–67, median disease duration 14 yrs, range 1–30 yrs), attending their follow-up visit at the outpatient clinic for AS patients. The diagnosis of AS was based on the revised New York criteria (12). All patients gave their written informed consent and the study protocol was approved by the local ethics committee. Consent was obtained by a pre-administered letter emphasising the anonymous and confidential nature of each question. The patients enrolled had never previously taken part in an COPM interview or received occupational therapy and in particular, at the time when COPM was administered, the following outcome measures were used: BASFI (1), BASMI (2) and the HAQ (Italian version) (13). The activity of the disease was assessed by

Competing interests: none declared.
the BASDAI (3) as well as by the acute phase reactants (ESR, CRP), patient’s and physician’s VAS on global disease activity and patient’s VAS scale on pain level.

The patients completed the COPM interview and scoring with an occupational therapist. The time spent on interview and scoring was recorded in minutes. At the end of the interview, the patients were asked to report their impression of the interview, if they found the questions easy or difficult to understand, and how they experienced the scoring procedure.

Ten of them, randomly chosen, were invited to complete the questionnaire again after a week interval to assess the reliability of the instrument.

Out of the thirty patients, 14 of them randomly chosen, were invited to repeat the COPM questionnaire 3 months after baseline and after an occupational therapy intervention. In particular, they were on stable pharmacological treatment and without physiotherapy.

All the interviews and the rescoring assessments were performed by the same occupational therapist and neither the observer nor the patients had access to the baseline value.

Translation
Two occupational therapists and a rheumatologist (P.G., M.P.M., A.S.) translated the questionnaire from English to Italian as a first draft; then they sent it to a native English speaker (W.J.P.) with good knowledge of Italian but without any knowledge of either questionnaire (the original in English and the Italian one) for their revision. The English speaker has also back translated the Italian version of the questionnaire and no significant cultural adaptations were made (see appendix).

COPM questionnaire
The COPM defines occupational performance as: consisting of self-care, productivity and leisure; being influenced by the environment, one’s social roles and one’s developmental level; being client-defined; and consisting of both a performance (objective) and a satisfaction (subjective) dimension. In COPM, the patients define their occupational performance problems within 3 areas of self-care, productivity, and leisure during a semi-structured interview. The patients are asked how important is to be able to do each of these activities, and each performance problem is rated for importance on a scale of 1–10 (1 = not important at all; 10 = extremely important). Finally, the 5 most important activities are rated from performances (1–10 where 1 = not able to do it) and satisfaction with performance (1–10 where 1 = not satisfied at all) by asking the patient to rate the way he or she perform this activity now, and how satisfied he or she is with that performance. Total performance and satisfaction scores are calculated by dividing the sum of the scores by the number of problems. Change in performance and satisfaction may then be measured by rescoring the prioritized problems after an agreed time period. A change of 2 or more is regarded as a clinically important difference (5).

BASFI
BASFI is a self-assessment instrument consisting of 8 specific questions regarding function and 2 questions reflecting the patient’s ability to cope with everyday life. The responses are given on VAS scales. The mean score of the 10 items gives the final BASFI score ranging from 0 (easy) to 10 (impossible) (1).

BASMI
BASMI was designed to measure spinal and hip mobility. The BASMI includes 5 clinical examinations of spine and hip joints, i.e the distance from tragus to wall, lumbar flexion and lateral flexion, cervical rotation and intermalleolar distance. The ratings are classified in categories from 0 to 2, where 0 is normal mobility. The BASMI score is the sum of the scores obtained in each test (0-10) (2). BASMI was performed by a rheumatologist (AS).

BASDAI
BASDAI is a self-administered instrument developed to assess disease activity in AS. BASDAI consists of 6 VAS scales related to major symptoms relevant to AS: fatigue, spinal pain, joint pain, localised tenderness, and morning stiffness. The BASDAI items range from absence (0) to very severe (10) symptoms. The mean score of the five items (mean of the two morning stiffness items plus the 4 remaining items) is applied as an estimate of disease activity. The BASDAI has been shown to be user-friendly and reliable and to reflect the entire spectrum of the disease (3).

HAQ questionnaire
The assessment of functional impairment was also collected with this instrument in all patients recruited. HAQ is the most frequently validated scale used for measuring disease-specific physical disability among patients with rheumatic disease. The HAQ has been translated into many languages and also an Italian version was validated years ago (13). It consists of 20 items divided into 8 categories: dressing and grooming, arising, eating, walking, personal hygiene, reaching, gripping, and other activities. Each item is rated from 0 to 3, with 0 = no difficulty and 3 = unable to do, and the highest score within a category is used as the category score.

Data analysis and statistics
Despite the lack of consensus regarding what instrument is the gold standard for assessing validity of the COPM, our hypothesis was that disease activity could be a factor determining the occupational performance and satisfaction. Therefore the construct validity was measured comparing the COPM to the BASDAI, using a non parametric correlation coefficient and calculating the correspondence between the disease activity score with COMP scores for performance and satisfaction at baseline. Therefore, considering our sample of patients we expected a high correlation as a rho=0.46. Internal consistency was assessed by Cronbach’s alpha coefficient. The external validity of the questionnaire was assessed comparing the COPM score to the gold standards taken into account (BASFI, BASMI, BASDAI and the Italian HAQ score) by Spearman’s correlation. The test-retest reliability technique of the items
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was performed with a week interval between measurement points and it was investigated by computing the Intraclass Correlation Coefficient. The Bland-Altman method was performed to test the agreement between the scores. Responsiveness was measured by evaluating the changes from baseline to the end of occupational therapy using Wilcoxon signed rank test. Moreover, the Standardised Mean Response (SMR) was evaluated for both COPM performance and satisfaction and it was calculated for each instrument by dividing the mean change score by the standard deviation of the mean change score. A value of >0.7 was considered a large effect. Feasibility was considered by assessing the time spent on the COPM, as well as the patient’s comments regarding the interview and scoring process, and whether or not the results from the assessment could serve as a basis for planning and evaluating the intervention (14).

Descriptive data were expressed, if not otherwise specified, as median and 25th-75th percentile. Statistical significance was accepted at p<0.05. Statistical analysis was carried out using the SPSS package for Windows (version 13.0; Chicago, IL).

Results

Descriptive data

All patients carried out the validation study. All demographic data are reported in Table I. The median value for the total COPM performance score was 8 (25th-75th percentiles = 7.2–9.0), while the median value for COPM satisfaction was 7.9 (25th-75th percentiles = 6.3–9.0).

In particular, the occupational performances problems represented 19 different activities, such as personal hygiene (n=33), eating (n=11), working (n=13), hobbies (n=13), mobility (n=14), travelling (n=10).

All patients found the questionnaire easy to understand and the questions let them explain their practical daily activity problems, and make the treatment plan easier. However, the patients also reported some difficulties to express in terms of numerical score their occupational performance or satisfaction with performance.

Construct validity: comparison of the COPM with BASDAI

The hypothesis that disease activity could be a factor determining the occupational performance and satisfaction was documented by the significant correlation with BASDAI: in fact, both COPM performance and satisfaction showed this association (rho=-0.491, p<0.01, rho=0.566, p<0.01, respectively).

External validity

In testing the external validity by comparison of the questionnaire to the BASFI, BASMI, BASDAI and HAQ, the COPM performance score showed a significant correlation with BASFI (rho=-0.566, p<0.001), BASDAI (rho=-0.491, p<0.006), while no correlation was found with BASMI and HAQ. The COPM satisfaction showed a significant correlation with BASFI (rho=-0.611, p<0.001) and BASDAI (rho=-0.431, p<0.018) and, similarly to the COPM performance, no correlation was found with BASMI and HAQ. Table II reports all the correlation computed.

**Table I.** Demographic, clinical data, and COPM scores of the 30 recruited patients.

<table>
<thead>
<tr>
<th>Number of patients (M/F)</th>
<th>24/6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (range)</td>
<td>48 (32-67) yrs</td>
</tr>
<tr>
<td>Mean disease duration (range)</td>
<td>14 (1-30) yrs</td>
</tr>
<tr>
<td>Work assessment:</td>
<td></td>
</tr>
<tr>
<td>Employed (full time/part time), n (%)</td>
<td>15 (50 )</td>
</tr>
<tr>
<td>Unemployed, n (%)</td>
<td>0</td>
</tr>
<tr>
<td>Retired, n (%)</td>
<td>5 (16,7 )</td>
</tr>
<tr>
<td>Self-employed, n (%)</td>
<td>10 (33,3)</td>
</tr>
<tr>
<td>BASDAI, median (25th-75th percentiles)</td>
<td>3.4 (1.9-4.5)</td>
</tr>
<tr>
<td>BASFI, median (25th-75th percentiles)</td>
<td>22.5 (9-42)</td>
</tr>
<tr>
<td>BASMI, median (25th-75th percentiles)</td>
<td>5 (4-6)</td>
</tr>
<tr>
<td>HAQ, median (25th-75th percentiles)</td>
<td>0.5 (0.22-1.25)</td>
</tr>
<tr>
<td>COPM performance, median (25th-75th percentiles)</td>
<td>8 (7.2-9.0)</td>
</tr>
<tr>
<td>COPM satisfaction, median (25th-75th percentiles)</td>
<td>7.9 (6.3-9.0)</td>
</tr>
<tr>
<td>BASDAI &gt; 4, n (%)</td>
<td>10 (30% )</td>
</tr>
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</table>

Fig. 1 shows the total numbers of described and prioritised occupational performance problems reported in 30 AS patients in Canadian Occupational Performance Measure interviews.

**Fig. 1.** Total numbers of described (white column) and prioritised (black column) occupational performance problems reported in 30 AS patients in Canadian Occupational Performance Measure interviews.
Reliability
Ten patients completed the questionnaire again after a week interval, without occupational therapy, and the test-retest reliability showed a good ICC correlation coefficient for COPM performance and COPM satisfaction (ICC = 0.77; 95% CI: 0.52-0.89; 0.79; 95% CI: 0.56-0.90, respectively). Bland-Altman plots for the reliability of COPM performance and COPM satisfaction were shown in Fig.2a and 2b.

Responsiveness
In the 14 selected patients, the COPM scores (mean±SD) for both performance and satisfaction showed a significant change (0.65±0.54, 1.23±0.69, respectively) from baseline (see table I) to the end of the occupational therapy (COPM performance = p<0.01; COPM satisfaction = p<0.001). Moreover, the SMR was large (>0.7) in both COPM performance and satisfaction, meaning that the instrument measured changes over time.

Feasibility
In order to address this aspect of the OMERACT filter, we recorded the time required for scoring the COPM. The average time spent to interview the patients and scoring COPM was 30 minutes (range 15–45 min) and it was deemed acceptable by patients and therapists. All patients found the questionnaire easy to understand and the questions let them explain their practical daily activity problems, and make the treatment plan easier. However, the patients also showed some difficulties to express in terms of a numerical score their occupational performance or satisfaction problems.

Discussion
This study was aimed to validate in Italian the COPM and our results showed that the version of the COPM in Italian is a valid, reliable and feasible measure. Although one of the possible limitations of our study could be the small sample size, these results agree with similar results obtained when the original COPM was translated into other languages (7, 8). In particular, the Norwegian version of the COPM was tested to measure the reliability in a group of patients with AS and the results confirmed that the COPM was a reliable instrument for use in clinical practice in patients with AS, and may serve as an instrument to promote a patient-centered approach in the

![Table II. Correlation with Spearman’s correlation coefficient (rho), between COPM and BASDAI, BASFI, BASMI and HAQ scores.](image)

<table>
<thead>
<tr>
<th></th>
<th>COPM performance</th>
<th>COPM satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASDAI</td>
<td>-0.491 (p=0.006)</td>
<td>-0.431 (p=0.018)</td>
</tr>
<tr>
<td>BASFI</td>
<td>-0.566 (p=0.001)</td>
<td>-0.611 (p=0.001)</td>
</tr>
<tr>
<td>BASMI</td>
<td>-0.079 (p=0.67)</td>
<td>-0.202 (p=0.28)</td>
</tr>
<tr>
<td>HAQ</td>
<td>-0.252 (p=0.17)</td>
<td>-0.314 (p=0.09)</td>
</tr>
</tbody>
</table>

![Fig. 2. Bland-Altman test for COPM performance (A) and COPM satisfaction (B). Both plots show the agreement between the difference and the subject mean of the observation points.](image)
planning and evaluation of rehabilitation programs (10). The latter study also showed that the COPM was a reliable instrument either when administered by personal interview or by mail, and demonstrating that even as postal questionnaire it could be a reliable instrument to evaluate any interventions and the surveillance of AS patients in clinical practice. These results, therefore, support the concept that using the COPM in clinical practice could improve the quality of care to the individual.

The construct validity of the Italian version of the instrument is supported by the strong correlation with the BASDAI, reflecting the level of disease activity in the group of patients enrolled. Moreover, in testing the external validity, the COPM showed a good correlation with BASFI which is the main specific functional outcome measure for AS patients. On the other hand, the absence of correlation of the COPM with the HAQ score indicates that the instrument measures function from a different aspect and this is, also, in keeping with previous results (9).

Although the sample patients involved in the reliability test was small, our results for COPM performance and COPM satisfaction, visualised in Bland-Altman plots, are in keeping with previous studies on AS patients (10, 15), showing that COPM is a reliable instrument for use in clinical practice as well as the approach to planning and evaluating rehabilitation intervention. Moreover, a fairly good intraclass correlation coefficients for test-retest reliability of performance and satisfaction was obtained. In fact, it showed an alpha coefficient of 0.77 and this result is in the range of a previous study performing the COPM in a mixed group of patients and concluding that it was a reliable measure (5).

Our study could show a limitation due to a possible roof effect of the COPM which in turn could be related, for some extent, to the small group of patients enrolled and their level of disease activity and severity. However, we confirmed that the COPM showed a good responsiveness, with a large SMR, to a rehabilitative intervention, showing its usefulness in daily clinical practice (7, 16, 17). Nevertheless, we might consider that in rheumatological outpatients settings the occupational therapists are not available everywhere.

In conclusion, the Italian version of COPM was well accepted by our patients, understandable, easy to complete and confirming that it can be considered an useful instrument to measure outcome and in planning treatment intervention for patients with AS.

Acknowledgments
We would like to thank Laura Brizzolari, Tania De Luca and Paola Piscopiello for their technical assistance.

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Il “Canadian Occupational Performance Measure” (COPM) è uno strumento di misurazione individualizzato, sviluppato per l’uso da parte dei terapisti occupazionali. Evidenzia cambiamenti che i pazienti percepiscono nel corso del tempo in relazione alla loro Performance Occupazionale.

### PUNTO 1: IDENTIFICARE I PROBLEMI DI PERFORMANCE OCCUPAZIONALE

Si tratta di identificare problemi, interessi ed esigenze di Performance Occupazionale. Interstivi il cliente, si informi sulle attività quotidiane della cura di sé, della produttività e del tempo libero. Lo inviti in seguito ad elencare tutte le attività quotidiane che egli ha bisogno di fare, desidererebbe fare, o ci si aspetta che faccia, immaginandosi una giornata tipica. Infine gli chieda di indicare quali sono le attività che al momento ha difficoltà a svolgere in modo soddisfacente. Riporti queste difficoltà ai punti 1A, 1B, 1C.

#### PUNTO 1A: Cura di sé
- **Autonomia personale**
  - (p.es. lavarsi, igiene personale, vestirsi, mangiare)
- **Mobilità**
  - (p.es. trasferimenti, spostamenti all’interno e all’esterno)
- **Organizzarsi nella comunità**
  - (p.es. trasporti, acquisti, finanze)

#### PUNTO 1B: Produttività
- **Lavoro retribuito/non retribuito**
  - (p.es. trovare o mantenere un posto di lavoro, attività di volontariato)
- **Conduzione dell’economia domestica**
  - (p.es. pulire, fare il bucato, cucinare)
- **Gioco/scuola**
  - (p.es. giocare, fare i Compiti)

### PUNTO 2: DETERMINAZIONE DELL’IMPORTANZA

Inviti il cliente a definire, la scala di valutazione acclusa, negli ambiti l’importanza di ogni attività da 1 a 10. Riporti i valori nei riquadri corrispondenti ai punti 1A, 1B, e 1C.
PUNTI 3+4: VALUTAZIONE – BILANCIO INIZIALE E SUCCESSIVO
Concordi con il cliente i 5 problemi più importanti e li riporti nello schema sottostante. Inviti il cliente a dare, tramite le carte di valutazione, un punteggio ad ogni problema per quanto riguarda la sua performance e il grado di soddisfazione dell’attuale capacità di esecuzione. Calcoli in seguito il valore complessivo sommando i punteggi relativi alla performance e alla soddisfazione e li divida per il numero dei problemi. Al momento del bilancio successivo il cliente valuta nuovamente, per ogni problema, la performance e la soddisfazione. Calcoli i nuovi valori e la loro differenza.

<table>
<thead>
<tr>
<th>Bilancio Iniziale:</th>
<th>Bilancio successivo:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problemi di performance occupazionale</td>
<td>PERFORMANCE</td>
</tr>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
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<tr>
<td>5.</td>
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Valutazione:

<table>
<thead>
<tr>
<th>Valore Totale = valore totale performance o soddisfazione</th>
<th>VALORE PERFORMANCE</th>
<th>VALORE SODDISFAZIONE</th>
<th>VALORE PERFORMANCE</th>
<th>VALORE SODDISFAZIONE</th>
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<tbody>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
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</table>

MODIFICAZIONE PERFORMANCE: = Valore performance 2 - Valore Performance 1 =

MODIFICAZIONE SODDISFAZIONE: = Valore soddisfazione 2 - Valore Soddisfazione 1 =

ULTERIORI OSSERVAZIONI E INFORMAZIONI

Bilancio iniziale:

Bilancio successivo: