

# Quality of Life After Restorative Proctocolectomy for Ulcerative Colitis

## *Different Questionnaires Lead to Different Interpretations*

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**Background:** According to some researchers, health-related quality-of-life scores for patients who undergo restorative proctocolectomy (RPC) for ulcerative colitis (UC) are comparable to those of healthy control subjects. Other studies show evidence that patients who undergo RPC experience a health-related quality of life similar to patients with mild UC or UC in remission.

**Hypothesis:** The discrepancy in health-related quality-of-life scores among studies may be due to different health-related quality-of-life analyses.

**Design:** Cross-sectional study.

**Setting:** Outpatient clinic of a tertiary care center.

**Patients:** In the first phase of the study, we consecutively enrolled 24 patients with UC, 24 patients with Crohn disease, and 24 healthy controls. In the second phase of the study, 40 patients who underwent RPC, 43 patients with UC, and 44 controls were consecutively enrolled.

**Interventions:** We administered an Italian version of the Cleveland Global Quality of Life (CGQL) instrument, the Padova Inflammatory Bowel Disease Quality of Life instrument, and the Italian 36-Item Short-Form Health Survey.

**Main Outcome Measures:** We evaluated the construct validity, internal consistency, test-retest reliability, sensitivity to change, and discriminant ability of the Italian CGQL instrument. We compared its discriminative ability with that of the Padova Inflammatory Bowel Disease Quality of Life instrument.

**Results:** The Italian CGQL instrument obtained good construct validity, internal consistency, test-retest reliability, and sensitivity to change. The Italian CGQL score did not distinguish patients who underwent RPC from healthy controls and those with mild UC or UC in remission, while the Padova Inflammatory Bowel Disease Quality of Life instrument reported similar scores for patients who underwent RPC and those with mild UC or UC in remission, and showed a difference vs healthy controls.

**Conclusions:** We validated an Italian version of the CGQL score. The different results obtained with the CGQL and the Padova Inflammatory Bowel Disease Quality of Life instruments can be attributed to the different discriminative ability of the 2 questionnaires.

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**R**ESTORATIVE PROCTOCOLECTOMY (RPC) is the first choice for the elective surgical treatment of patients affected by ulcerative colitis (UC).<sup>1,2</sup> Total proctocolectomy with an end ileostomy or a Kock pouch was the only available surgical therapy for UC up to the late 1970s. In 1978, Parks and Nicholls<sup>3</sup> introduced the first pelvic pouch, which, beside the complete excision of the diseased bowel and the reduction of the risk of cancer, preserves the natural route of defecation while maintaining fecal continence without the need for a permanent ostomy.<sup>1,4,5</sup> While some unsatisfactory functional results still may affect patients, the refinements of the technique and increased surgical ex-

perience over time produced a sensible reduction of the morbidity of the procedure<sup>6</sup>; therefore, the importance of quality of life of patients increased consistently as a theoretical<sup>7</sup> and practical measure of surgical outcome.<sup>8,9</sup> The relatively young age of such patients, their subsequent life expectancy, and the widening of the surgical indications beyond the limits of the life-saving surgery imposed an accurate analysis of quality of life that became the measure of the efficiency of the procedure.<sup>7</sup>

The main question that patients ask when they are proposed RPC is as follows: "How will I feel after the operation; what will my life be like?" These sorts of questions are even more crucial if we propose RPC to patients for dysplasia in UC,

because these patients often have UC in remission or mild UC.

The answer to these questions varies substantially between 2 distinct positions. According to literature from the Cleveland Clinic, Cleveland, Ohio, and some other centers, the excellent long-term functional results of RPC produce health-related quality-of-life (HRQL) scores comparable to those of healthy control subjects. In several reports, these conclusions were obtained with one of the most affirmed instruments used for HRQL analysis in patients who underwent RPC: the Cleveland Global Quality of Life (CGQL) instrument.<sup>9-13</sup> This questionnaire was also recently validated for patients with Crohn disease (CD)<sup>14</sup>; it is quick to administer and practical to manage, especially for large patient cohorts.<sup>9</sup>

On the contrary, according to some other researchers,<sup>15-18</sup> patients who undergo RPC for UC experience long-term quality of life similar to that of patients with UC who have mild disease activity or patients with UC in remission because of long-term pouch complications, a conspicuous number of daily stools or a certain degree of incontinence or urgency, continuous use of drugs, and psychological distress. These problems are referred, in different measures, by all the clinical series, but the relative weight attributed to them in the different questionnaires is not identical. Our results were obtained with a specific HRQL instrument (the Padova Inflammatory Bowel Disease Quality of Life [PIBDQL]), which was developed in our department in 1995 for patients with UC and patients who undergo RPC.<sup>19</sup>

We believe the difference between the 2 equivalences (RPC=mild UC or UC in remission and RPC=healthy controls) is not just merely academic, especially when we have to explain it to a surgical candidate and ask for his or her consent. Therefore, this evident inconsistency between these different points of view raised the following question: what is the cause of this difference—surgical outcome or HRQL analysis?

The aim of this study was to validate an Italian version of the CGQL instrument to assess the HRQL of our patients with both instruments to understand if the different results might be explained by different interpretations of the long-term outcome of the 2 questionnaires. To reach this aim, we quantified the construct validity, internal consistency, reliability, and sensitivity to change of an Italian version of the CGQL score and then we compared its discriminant ability with that of the PIBDQL score.

## METHODS

### STUDY DESIGN

We organized our study in 2 different phases. In the first phase, after the translation of the CGQL instrument into Italian, we administered the Italian CGQL instrument and the Italian 36-Item Short-Form Health Survey (SF-36) to a cohort of patients and calculated the respective disease activity indexes to assess the construct validity. With a fixed  $\alpha$  (the probability of committing a type I error) at .05 (2-tailed),  $\beta$  (the probability of committing a type II error) at .10, and  $r$  (expected Pearson correlation coefficient, effect size) at 0.70, the sample size of this cohort was calculated to be at least 17 patients for each

group. In this phase, we consecutively enrolled 24 patients with UC (operated on and not operated on), 24 patients with CD (operated on and not operated on), and 24 healthy controls.

The second phase of the study evaluated the internal consistency, test-retest reliability, sensitivity to change, and discriminant ability, and implicated the direct comparison of the results of the Italian CGQL instrument with those of the PIBDQL instrument in patients with UC after RPC. With a set  $\alpha$  at .05 (2-tailed),  $\beta$  at .10, and standardized effect size (expected effect size divided by standard deviation) at 0.80, the sample size of this cohort was calculated to be at least 33 patients for each group. In this phase, we consecutively recruited 40 patients who underwent RPC for UC, 43 patients affected by UC with a different degree of severity, and 44 healthy controls.

Because self-administration of the English CGQL instrument, the SF-36, and the PIBDQL instrument had been validated previously, the patients agreed to answer the questionnaires while they were waiting for their routine medical examination. If the patient had not attended the clinic for more than 1 year, the information was obtained by mail.

## PATIENTS

We enrolled 2 cohorts of patients in our study. The first cohort, patients who received the Italian CGQL instrument and the SF-36, was composed of 24 patients with UC (operated on and not operated on), 24 patients with CD (operated on and not operated on), and 24 healthy controls. The characteristics of patients involved in phase 1 are summarized in **Table 1**.

The second step of the study involved 40 patients who underwent RPC for UC from January 1, 1984, to May 1, 2003, consecutively attending our clinic; 43 nonoperated on patients affected by UC with differing degrees of severity; and 44 healthy controls enrolled as controls. In the RPC patient group, the indications for surgery were failure of medical therapy in 17 patients, severe manifestations of disease in 16 patients, toxic megacolon in 3 patients, high-grade dysplasia in 2 patients, adenocarcinoma in 1 patient, and pouch redoing in 1 patient. A 3-stage procedure was performed in 16 patients, and the other 24 patients underwent a 2-stage procedure. In 9 patients, the procedure was performed in urgency or emergency. The mean  $\pm$  SD follow-up after ileostomy closure was 8.3  $\pm$  4.0 years. None of the operated on patients reported severe fecal incontinence, but occasional soiling or uncontrolled flatus episodes occurred in 10 of these patients. During the study, 4 patients showed signs of clinically active pouchitis. In our study group, there were 3 patients reporting postoperative anastomotic fistula (1 of them needed a pouch defunctioning and a successive redoing), 2 with postoperative anastomotic stenosis (treated with transanal dilatation) and 1 with a perianal abscess. During the study, no patient was experiencing any active complication.

The patients with UC (nonoperated on) included 22 men and 21 women. During the study, according to the Seo index, 25 patients were in remission or had mild colitis, 12 had moderate colitis, and 6 had severe colitis. All of these patients, excluding 5, were receiving oral mesalazine, and 20 of them were also taking corticosteroids ( $n=13$ ) and/or azathioprine ( $n=9$ ).

The healthy controls included 17 men and 27 women; they did not complain of any relevant gastroenteric symptoms. No statistically significant differences for age and sex were evidenced in the composition of the 3 groups of the study. The characteristics of patients involved in phase 2 are summarized in **Table 2**.

### DISEASE ACTIVITY QUANTIFICATION

The diagnosis of patients with UC and CD was based on clinical features, laboratory tests of inflammation, and endoscopic

**Table 1. Patient Characteristics for the Italian CGQL Instrument vs the SF-36 Analysis\***

Characteristic	Patients With UC (n = 24)	Patients With CD (n = 24)	Healthy Controls (n = 24)
Age, y†	43 ± 13 (42)	39 ± 13 (35)	41 ± 16 (50)
Male-female ratio	14:10	14:10	9:15
Daily stool frequency†	4 ± 3 (4)	3 ± 2 (3)	NA
Rectal bleeding	5	2	NA
Weight loss	5	7	NA
Occasional fecal incontinence	3	5	NA
Disease activity index score‡	153 ± 46 (131)	300 ± 137 (294)	NA
Medical therapy	17	23	NA

Abbreviations: CD, Crohn disease; CGQL, Cleveland Global Quality of Life; NA, data not applicable; SF-36, 36-Item Short-Form Health Survey; UC, ulcerative colitis.

\*Data are given as number of patients unless otherwise indicated.

†Data are given as mean ± SD (median).

‡The Seo index was used for patients with UC, and the Crohn's Disease Activity Index was used for patients with CD.

**Table 2. Patient Characteristics for the Italian CGQL Instrument vs the PIBDQL Instrument Analysis\***

Characteristic	Patients Who Underwent RPC (n = 40)	Patients With UC (n = 43)	Healthy Controls (n = 44)
Age, y†	42 ± 12 (40)	42 ± 13 (40)	39 ± 13 (36)
Male-female ratio	29:11	22:21	17:27
Daily stool frequency†	6 ± 2 (5)	3 ± 2 (2)‡	NA
Rectal bleeding	4	14‡	NA
Weight loss	1	8‡	NA
Occasional fecal incontinence	10	8	NA
Medical therapy	6	37‡	NA

Abbreviations: CGQL, Cleveland Global Quality of Life; NA, data not applicable; PIBDQL, Padova Inflammatory Bowel Disease Quality of Life; RPC, restorative proctocolectomy; UC, ulcerative colitis.

\*Data are given as number of patients unless otherwise indicated.

†Data are given as mean ± SD (median).

‡ $P < .05$  for patients who underwent RPC vs patients with UC.

and histologic findings. We also collected the following clinical data to evaluate disease activity: number of daily bowel movements, presence of rectal bleeding, fever, weight loss, perineal pain, joint pain, incontinence, use of drugs (all of these data referred to the previous 2 weeks), and laboratory data, including hemoglobinemia, white blood cell count, erythrocyte sedimentation rate, C-reactive protein level, and albuminemia.

The Seo index was used to define UC disease activity that was graded as in remission or mild, moderate, or severe.<sup>20,21</sup> The variables evaluated by this index are as follows: number of daily bowel movements, presence of rectal bleeding, hemoglobine-mia, erythrocyte sedimentation rate, and albuminemia. A score of less than 150 indicates remission or mild disease; between 150 and 220, moderate activity; and more than 220, severe manifestations of disease. The Crohn's Disease Activity Index was used to assess the severity of CD.<sup>22</sup>

## ITALIAN CGQL INSTRUMENT

The CGQL score consists of 3 items (current quality of life, current quality of health, and current energy level), each on a scale of 0 to 10 (0 indicates worst; and 10, best). The scores were added, and the final CGQL utility was obtained by dividing this result by 30.<sup>9</sup> The translation-back translation technique was used to translate the CGQL instrument into Italian. A graduated bilingual Italian surgeon (M.S.) performed the initial translation into Italian, and a native Italian American resident (C.R.) then independently performed the back translation from Ital-

ian into English. The back translation was verified with the original CGQL instrument and approved. Pilot test subjects who underwent RPC found that the Italian CGQL instrument was comprehensible and easy to complete, and no further changes were made. Patients also completed a second Italian CGQL instrument at least 2 weeks after the first survey to determine in-traindividual variations.

## 36-ITEM SHORT-FORM HEALTH SURVEY

For validation purposes, a cohort of 24 patients with UC, 24 patients with CD, and 24 healthy controls completed a previously validated Italian translation of the Medical Outcomes Study SF-36.<sup>23</sup> This instrument is a non-disease-specific HRQL questionnaire that explores the domains of physical functioning, physical health, bodily pain, general health, vitality, social functioning, emotional status, and mental health. A better health status is indicated by a higher score. The SF-36 can be considered a gold standard tool to validate a generic quality-of-life questionnaire, and its English version has already been used for patients who underwent RPC.<sup>9,24</sup>

## PIBDQL INSTRUMENT

The PIBDQL instrument was developed in our department in 1995 for UC, CD, and RPC.<sup>17-19</sup> This specific questionnaire was validated for reproducibility in healthy controls and in pa-

**Table 3. Italian CGQL Construct Validity Assessed by the Spearman Rank Correlation With the SF-36 and Disease Activity Indexes**

Construct	Italian CGQL	Quality of Life	Quality of Health	Energy Level
Italian CGQL vs SF-36*				
Physical functioning	0.62	0.62	0.58	0.59
Role physical	0.54	0.56	0.49	0.48
Bodily pain	0.58	0.59	0.55	0.52
General health	0.70	0.68	0.63	0.63
Vitality	0.71	0.62	0.61	0.73
Social functioning	0.62	0.52	0.47	0.68
Role emotional	0.57	0.52	0.47	0.54
Mental health	0.62	0.49	0.53	0.64
SF-36 (overall)	0.77	0.70	0.67	0.76
CGQL vs disease activity				
CDAI	-0.66†	-0.54†	-0.53†	-0.70†
Seo index	-0.42†	-0.64†	-0.33	-0.41†

Abbreviations: CDAI, Crohn's Disease Activity Index; CGQL, Cleveland Global Quality of Life; SF-36, 36-Item Short-Form Health Survey.

\* $P < .001$  for all correlation values.

† $P < .05$ .

tients with UC and patients who underwent RPC. This tool, predisposed to be self-administered, consists of 29 multiple-choice questions that explore intestinal symptoms (8 questions), systemic symptoms (7 questions), emotional function (9 questions), and social function (5 questions). The possible answers for each question were graded on a 4-point scale (1 indicates never or hardly ever; 2, sometimes; 3, often; and 4, always or nearly always), and the maximal score was 87. A higher score corresponded to a lower HRQL.

#### STATISTICAL ANALYSIS AND VALIDATION PROCEDURES

Data are presented as mean  $\pm$  SD. All the statistical analysis was performed with computer software (STATISTICA 5.0; StatSoft, Padova). The 2-tailed Fisher exact test with Bonferroni correction for multiple comparisons was used to compare dichotomous variables where appropriate. Construct validity refers to how well the equivalent domain scores of the Italian CGQL instrument correlate with the corresponding items of the SF-36, and was analyzed using the Spearman rank correlation coefficient. The internal consistency of the Italian CGQL instrument was investigated with the Cronbach  $\alpha$ .<sup>25</sup> A Cronbach  $\alpha$  of greater than 0.8 indicates excellent internal consistency. Patients who completed the second Italian CGQL instrument were divided into those with stable disease activity and those with modified disease activity. The reliability assessed the homogeneity of the Italian CGQL instrument in those with stable disease, and was analyzed with the Wilcoxon signed rank test. Sensitivity to change measured the ability of the Italian CGQL instrument to detect a change in disease activity using either the Wilcoxon signed rank test or the Spearman rank correlation coefficient. A significant change in disease activity was defined for patients with UC as a class change of the Seo activity index (ie, mild to moderate), and for patients who underwent RPC, a significant change in stool frequency, as described by Fazio et al.<sup>9</sup> Discriminative ability refers to how well the Italian CGQL and the PIBDQL instruments differentiate RPC from active UC, quiescent disease, and healthy controls, and it was obtained comparing Italian CGQL with PIBDQL results according to the diagnosis and to the disease activity indexes using an analysis of variance followed by the Least Significant Difference post hoc test.  $P < .05$  was considered significant.

## RESULTS

The construct validity of the Italian CGQL instrument was analyzed with the Spearman rank correlation test in the first step of our study. We correlated the Italian CGQL instrument with the previously validated Italian SF-36 and the clinical activity indexes, as presented in **Table 3**. Italian CGQL single-item and overall scores correlated strongly with all Italian SF-36 domains (all 4 CGQL items,  $P < .001$ ). A similarly strong correlation was evident with the Crohn's Disease Activity Index in patients with CD, while the correlation with the Seo activity index for patients with UC, although statistically significant, was a little weaker. In effect, the correlation between the quality-of-health item and the Seo index did not reach full statistical significance.

To determine the internal consistency of the Italian CGQL instrument, the Cronbach  $\alpha$  was calculated using all 243 questionnaires completed by the 49 patients who underwent RPC, the 58 patients with UC, the 24 patients with CD, and the 68 healthy controls. The Cronbach  $\alpha$  for these data was 0.90, demonstrating good internal consistency. Furthermore, the Cronbach  $\alpha$  calculated exclusively in the 73 questionnaires completed by patients who underwent RPC was 0.86, confirming acceptable internal consistency.

The test-retest reliability was assessed by the comparison between the Italian CGQL results of 24 patients who underwent RPC and 20 patients with UC, obtained at 2 different occasions at a mean of 44 days apart. The Wilcoxon matched-pairs test for the 3 items and the overall Italian CGQL score showed that there was no statistical difference in the 20 patients with unchanged disease activity (CGQL score,  $7.97 \pm 1.11$  vs  $7.67 \pm 1.15$ ;  $P = .20$ ). On the contrary, patients who underwent RPC and patients with UC who had worse disease activity at the second questionnaire obtained a significantly lower Italian CGQL score (CGQL score,  $7.00 \pm 1.11$  vs  $6.03 \pm 1.33$ ;  $P = .05$ ). Similarly, patients who underwent RPC and patients with UC who had better disease activity at the second questionnaire obtained a significantly improved Italian CGQL score (CGQL score,  $6.11 \pm 1.91$  vs  $7.07 \pm 1.44$ ;  $P = .02$ ). The ac-

ceptable sensitivity to change of the Italian CGQL score, confirmed by these last 2 results, was also assessed by the correlation between the variation of disease activity and the variation of CGQL score ( $R = -0.29$ ,  $P = .05$ ).

To understand how well the Italian CGQL instrument differentiates patients who underwent RPC from those with active UC, those with quiescent disease, and healthy controls, the Italian CGQL and the PIBDQL scores were compared according to the disease activity indexes using an analysis of variance followed by a least significant difference post hoc test. In our series, the PIBDQL

scores of patients who underwent RPC were significantly lower (better) than those of patients with UC and significantly higher (worse) than those of healthy controls. On the contrary, the CGQL scores of patients who underwent RPC were significantly better than those of patients with UC and similar to those of healthy controls (**Table 4**). More accurate analysis according to UC disease activity groups demonstrated that in our patients who underwent RPC, PIBDQL scores were similar to those of patients with UC in remission or mild UC. On the contrary, the discriminative ability of the Italian CGQL instrument failed to differentiate those with moderate UC from those with UC in remission or mild UC and those who underwent RPC from those with UC in remission or mild UC or healthy controls (**Table 5**).

The analysis of the single items showed that according to the PIBDQL instrument, patients who underwent RPC reported scores comparable to those with moderate UC for intestinal and systemic symptoms and similar to those with mild UC or UC in remission for emotional and social function. Healthy control scores were lower than RPC scores for every item. On the contrary, according to the Italian CGQL instrument, patients who underwent RPC obtained scores comparable to those with moderate UC for actual quality of life, similar to patients with mild UC or UC in remission for quality of health and energy levels, and similar to healthy controls for energy levels and actual quality of life. Single-item results are detailed in **Table 6** and **Table 7**.

**Table 4. Italian CGQL and PIBDQL Discriminant Ability Obtained by the Comparison Between the 3 Groups With 1-Way ANOVA Followed by the Least Significant Difference Post Hoc Test**

Variable	RPC Group	UC Group	Healthy Control Group
PIBDQL score*	14.9 ± 11.3	22.4 ± 15.2	9.6 ± 6.6
P value†			
RPC group	NA	<b>.004</b>	<b>.04</b>
UC group	<b>.001</b>	NA	<b>&lt;.001</b>
Healthy control group	.22	<b>&lt;.001</b>	NA
Italian CGQL score*	7.6 ± 1.3	6.5 ± 1.8	8.0 ± 1.0

Abbreviations: ANOVA, analysis of variance; CGQL, Cleveland Global Quality of Life; NA, data not applicable; PIBDQL, Padova Inflammatory Bowel Disease Quality of Life; RPC, restorative proctocolectomy; UC, ulcerative colitis.

\*Data are given as mean ± SD.

†P values that are relative to PIBDQL are in bold.

**Table 5. Italian CGQL and PIBDQL Discriminant Ability Obtained by the Comparison Between the 5 Groups With 1-Way ANOVA Followed by the Least Significant Post Hoc Test**

Variable	RPC Group	UC Group			Healthy Control Group
		Severe	Moderate	Mild	
PIBDQL score*	14.9 ± 11.3	48.5 ± 12.4	21.6 ± 10.9	16.5 ± 10.3	9.6 ± 6.6
P value†					
RPC group	NA	<b>&lt;.001</b>	<b>.04</b>	<b>.52</b>	<b>.01</b>
UC group					
Severe	<b>&lt;.001</b>	NA	<b>&lt;.001</b>	<b>&lt;.001</b>	<b>&lt;.001</b>
Moderate	.06	<b>&lt;.001</b>	NA	<b>.14</b>	<b>&lt;.001</b>
Mild	.07	<b>&lt;.001</b>	.65	NA	<b>.005</b>
Healthy control group	.18	<b>&lt;.001</b>	.005	.003	NA
Italian CGQL score*	7.6 ± 1.3	4.2 ± 2.3	6.8 ± 1.2	7.0 ± 1.4	8.0 ± 1.0

Abbreviations: See Table 4.

\*Data are given as mean ± SD.

†P values that are relative to PIBDQL are in bold.

**Table 6. Analytic Scores of the PIBDQL Obtained by the Comparison Between the 5 Groups With 1-Way ANOVA Followed by the Least Significant Difference Post Hoc Test\***

Patient Group	Intestinal Symptoms	Systemic Symptoms	Emotional Function	Social Function	PIBDQL
RPC	4.95 ± 3.54	3.93 ± 3.45	4.63 ± 4.09	1.40 ± 2.43	14.90 ± 11.32
UC					
Severe	14.33 ± 3.61†	11.67 ± 2.58†	14.83 ± 6.24†	7.67 ± 3.78†	48.50 ± 12.42†
Moderate	6.17 ± 4.57	5.33 ± 3.45	7.92 ± 3.63†	2.25 ± 2.83	21.67 ± 10.95†
Mild or in remission	3.24 ± 3.53†	5.84 ± 3.31†	6.24 ± 3.84	1.24 ± 1.67	16.52 ± 10.29
Healthy control	2.05 ± 1.96†	3.43 ± 2.79†	3.66 ± 2.96†	0.43 ± 1.09†	9.57 ± 6.59†

Abbreviations: See Table 4.

\*Data are given as mean ± SD.

†P < .05 for the RPC group vs the other group.

**Table 7. Analytic Scores of the Italian CGQL Instrument Obtained by the Comparison Between the 5 Groups With 1-Way ANOVA Followed by the Least Significant Difference Post Hoc Test\***

Patient Group	Actual Quality of Life	Quality of Health	Energy Level	Italian CGQL
RPC	7.83 ± 1.47	7.51 ± 1.55	7.54 ± 1.51	7.62 ± 1.34
UC				
Severe	4.17 ± 2.23†	3.50 ± 1.97†	4.83 ± 2.93†	4.17 ± 2.32†
Moderate	7.33 ± 1.15	6.42 ± 1.16†	6.67 ± 1.72†	6.81 ± 1.18†
Mild or in remission	7.00 ± 1.63†	7.04 ± 1.57	7.00 ± 1.58	7.01 ± 1.43
Healthy control	8.09 ± 1.31	8.39 ± 0.99†	7.55 ± 1.30	8.01 ± 1.01

Abbreviations: See Table 4.

\*Data are given as mean ± SD.

† $P < .05$  for the RPC group vs the other group.

## COMMENT

Restorative proctocolectomy guarantees the complete excision of the diseased bowel and the reduction of the risk of cancer and preserves the natural route of defecation, so it can be fully considered as the first choice for the elective treatment of patients affected by UC who need surgical therapy.<sup>1,2</sup> Because the amelioration of the technique and increased surgical experience has led to a substantial reduction of the complications of this procedure,<sup>26</sup> the quality of life of patients gained its place as a major surgical outcome measure among the traditional ones, such as mortality and morbidity.<sup>7,27</sup>

In the literature, there are substantially 2 distinct positions about quality of life after RPC. There are researchers, from some important centers, such as the Cleveland Clinic, who claim that the excellent long-term functional results of RPC offer patients long-term HRQL comparable to that of healthy controls.<sup>9-13</sup> On the other hand, other researchers,<sup>15-18</sup> and we are among them, state that patients who undergo RPC for UC experience long-term quality of life similar to that of patients with mild UC or remission disease activity because of long-term pouch complications, a conspicuous number of daily stools, a certain degree of incontinence or urgency, continuous use of medication, or psychological distress.

Our aim was to translate and validate an Italian version of the CGQL instrument and to apply it with the PIBDQL instrument to our patients who underwent RPC to understand the cause of this dichotomy. Our analysis demonstrated that the different results obtained with the CGQL and the PIBDQL instruments can be attributed to the different discriminative ability of the 2 questionnaires. The CGQL score did not differentiate patients who underwent RPC from healthy controls and patients with mild UC or UC in remission. On the contrary, the PIBDQL score of patients who underwent RPC is just comparable to that of patients with mild UC or UC in remission, and these results seem to be consistent with the functional results.

These conclusions were reached through a multistep study. In a preliminary phase, we translated the CGQL instrument into Italian using the translation-back translation technique,<sup>28</sup> and then we quantified the construct validity, internal consistency, reliability, and sensitivity to change. We included in our analysis patients with UC,

patients with CD, and healthy controls because the CGQL instrument is a generic non-disease-specific questionnaire and in this way we had adequate controls for the validation and the comparison.

The construct validity shows how the Italian CGQL questionnaire reflects the disease activity and the previously validated generic quality-of-life scores.<sup>29</sup> As expected, Italian CGQL scores correlated strongly with all Italian SF-36 domains. A good correlation was also evident between the Italian CGQL instrument and the Crohn's Disease Activity Index in patients with CD, while the correlation with the Seo activity index for patients with UC, although statistically significant, was a little weaker, probably because of the presence of patients who underwent RPC in this group. In effect, the Seo index was not thought specific for patients who underwent RPC.

The internal consistency (ie, an index of reliability) measures the extent to which different questions within a scale yield consistent responses.<sup>29</sup> The excellent internal consistency of the Italian CGQL instrument was assessed using all 243 questionnaires completed by all the patients who underwent RPC, the patients with UC, the patients with CD, and healthy controls.<sup>9</sup> Moreover, the Cronbach  $\alpha$  calculated exclusively in the 73 questionnaires completed by patients who underwent RPC confirmed an internal consistency comparable to that reported by Fazio et al in 1999.<sup>9</sup>

The test-retest reliability verified the homogeneity of the Italian CGQL scores in patients with stable health status because the 3 items and the overall scores showed no statistical difference in the patients with unchanged disease activity. The sensitivity of the Italian CGQL scale to measure change over time was well evidenced: at the second check, patients with worse or improved disease activity showed significant and coherent variation of their Italian CGQL score. Then, the correlation between the variation of disease activity and the variation of CGQL score confirmed the acceptable responsiveness of the questionnaire. We chose a relatively wider interval to do the retest, compared with standard,<sup>7,28</sup> to avoid any bias due to the memory of the previous answers.

The final phase of the study was focused on the discriminative ability of the Italian CGQL score, which was the critical point of our analysis. According to our results, the same patients who underwent RPC at the same time obtained a similar Italian CGQL score as healthy con-

trols and patients with mild UC or UC in remission, while the PIBDQL scores of patients who underwent RPC were significantly worse than those of healthy controls and similar to those of patients with UC in remission or mild UC. These results confirmed, in part, what was reported by Fazio et al<sup>9</sup> about the CGQL instrument and what was already demonstrated for the PIBDQL instrument.<sup>17,18</sup>

In our study, the Italian CGQL instrument differentiated patients who underwent RPC from patients with active UC, but failed to distinguish their HRQL scores from those of healthy controls and patients with UC in remission or mild UC. Several studies<sup>9,30</sup> claiming the presumed HRQL parity between patients who underwent RPC and healthy controls did not enroll any UC control groups and used general population norms. Muir et al,<sup>31</sup> who performed a prospective evaluation of HRQL after RPC with the SF-36, found that long-term results were comparable to the standard general population and better than those of patients with UC, but this group was composed of 95% of patients with severe colitis. Furthermore, the Italian CGQL instrument also failed to differentiate UC in remission or mild UC from moderate UC and, maybe, this failure might be attributed to the few patients with severe and moderate UC enrolled in our study. However, the whole discriminative ability of this questionnaire seems rather questionable as, in part, suggested by McLeod in the discussion of the Cleveland Clinic article.<sup>9</sup> In our opinion, the Italian CGQL instrument, as a non-disease-specific questionnaire, might be hardly considered as a discriminative instrument according to the Kirshner and Guyatt<sup>32</sup> classification of health indexes.<sup>6</sup> Thereafter, comparisons between patient groups obtained with non-disease-specific instruments should be cautiously evaluated. Probably, these types of quality-of-life surveys may not be the best tool to evaluate among different conditions and may be better used to compare outcomes among a single condition.

According to the analysis of the single items of the PIBDQL instrument, patients who underwent RPC reported similar scores to moderate UC for intestinal and systemic symptoms and similar to mild UC remission for emotional and social function. The global PIBDQL score indicates that patients who underwent RPC obtained similar scores to those with mild UC or UC in remission, so, once again, we underline the role and the weight of the emotional and social function of the HRQL of these patients.<sup>18</sup> The importance of these items in patients who underwent RPC is also remarked on in the study by Thirlby et al,<sup>16</sup> performed with a modified version of the SF-36, enhanced in emotional and mental status, which confirmed that the HRQL of patients who underwent RPC is lower than that of the general population.

According to the Italian CGQL instrument, patients who underwent RPC obtained scores similar to healthy controls for actual quality of life and energy level and similar to patients with mild UC or UC in remission for quality of health and energy level. Therefore, actual quality of life and energy level are the 2 items that make the Italian CGQL scores after RPC comparable to those of healthy controls. In these generic variables, the role of emotional and social function is likely undervalued, as also suggested by Fazio et al.<sup>9</sup>

Finally, the inconsistency between the less than optimal functional RPC result and "normal" HRQL seems quite evident, even in large series. Patients who underwent RPC, in ours and in all series, report a mean±SD of 6±2 daily bowel movements, which is quite far from healthy control standards, a not reducible rate of long-term pouch complications, such as pouchitis, or a certain degree of incontinence or urgency.<sup>9,26,33</sup> Any relation between HRQL and bowel functions, as investigated by Ko et al,<sup>34</sup> may be missed or overshadowed by a generic non-disease-specific HRQL questionnaire, such as the CGQL instrument or the SF-36. On the other hand, the main role played by emotional and social functions in the discriminative ability of the PIBDQL instrument avoids any inappropriate overweight of bowel functional factors or other systemic symptoms that may not necessarily correlate well with patients' perceived quality of life and satisfaction with the outcome of their surgery for UC.<sup>7</sup>

In conclusion, we validated an Italian version of the CGQL score and we compared its results with those of the PIBDQL score on the same patients who underwent RPC. The difference in the interpretation of the same HRQL can be attributed to the different discriminant ability of the 2 questionnaires. The generic Italian CGQL score did not distinguish patients who underwent RPC from healthy controls or from patients with mild UC or UC in remission, while the disease-specific PIBDQL score underlined the difference between patient and control groups. According to the PIBDQL score, patients who undergo RPC experience an HRQL similar to patients with mild UC or UC in remission, and this matching seems consistent with postoperative bowel function.

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