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Development and validation of the QUECOMICAT questionnaire: a tool to assess disease-related knowledge in patients with inflammatory bowel disease

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ABSTRACT

Introduction: adequate knowledge of inflammatory bowel disease (IBD) is essential for a successful patient-centered management of IBD.
Objective: due to the scarcity of up-to-date tools for measuring IBD literacy, this single-center, prospective study aimed to develop and validate a new questionnaire to assess IBD-related knowledge.

Material and methods: the study included patients followed up at the Crohn-Colitis Care Unit (UACC) at the Hospital Vall d’Hebron (Barcelona, Spain). Patients admitted to the UACC for the first time were subsequently enrolled into a standard IBD educational program. A pilot questionnaire was developed and validated in 92 IBD patients by determining the internal consistency reliability (Cronbach’s α test), feasibility, construct validity (correlation with the Crohn’s and Colitis Knowledge [CCKNOW] questionnaire and a knowledge visual analog scale [VAS]) and sensitivity (score change before and after a standard IBD educational program). The questionnaire, named “Qüestionari Coneixements Malaltia Inflamatòria Intestinal Catalunya” (IBD-knowledge questionnaire Catalonia) (QUECOMIICAT) was written in Spanish and had 25 items addressing six dimensions: general concepts, clinic, treatment, surgery, habits and social context.

Results: the median (interquartile range) completion time was 15 (10-20) minutes and the floor and ceiling effects were 1.1% and 2.1%, respectively. The Cronbach’s α coefficient was α = 0.75. QUECOMIICAT significantly correlated with the VAS (rho = 0.34, p < 0.01) and CCKNOW questionnaires (rho = 0.74, p < 0.01). Patient knowledge significantly increased 24 hours after attending a standard IBD educational program and remained statistically significant one month later (Pearson’s test-retest correlation coefficient r = 0.81, p < 0.001).

Conclusion: in conclusion, the QUECOMIICAT questionnaire is a new up-to-date tool to assess IBD-related knowledge with good feasibility and validation results for use in the routine clinical practice.

Key words: Crohn’s disease (CD). Ulcerative colitis (UC). Self-concept. Educational program.
INTRODUCTION

Inflammatory bowel disease (IBD), which includes Crohn’s disease (CD) and ulcerative colitis (UC), is a chronic condition with a significant impact on the patients’ quality of life (1,2). The management of IBD is approached via a patient-centered care model, so that patients can actively participate in the treatment provided that they have sufficient levels of disease literacy (3-5). Irrespective of the care model, a greater knowledge about IBD has been associated with less health-related stress, better coping with the disease, treatment adherence and, consequently, course of pathology. All of which reduces healthcare costs (6-8). Concurrently with the reported benefits of a greater knowledge about IBD, a large proportion of patients identify the lack of information as one of the main concerns regarding their condition (9,10). Thus, adequate disease knowledge is crucial for IBD management and may eventually benefit both the patients and the healthcare system.

Due to the increasing interest in improving patients’ health literacy, various lay-led disease-specific educational programs have been developed in recent years (11). These programs have their own tools to measure patient satisfaction, changes in habits and lifestyle and acquisition of knowledge (10). However, tools to measure knowledge acquisition and determine to what extent this knowledge improves patients’ disease control and perception in the field of IBD are scarce. Aside from the Decision Aid and Knowledge Questionnaire that was specifically developed for UC patients elected for surgery (12), only two questionnaires to assess patient knowledge about IBD are currently available. These are the Crohn’s and Colitis Knowledge (CCKNOW) questionnaire and the Knowledge Questionnaire (KQ), which contain 24 and 36 items, respectively (13,14). Furthermore, CCKNOW has been recently translated to Spanish (15) and updated to a substantially longer questionnaire (65-item) (16). However, the KQ remains in its original 1993 version and therefore, lacks numerous advances in IBD treatment (e.g., use of biological agents) (2,17-19). Knowledge of all disease-related areas is essential in the context of a patient-centered care model. Thus meaning that
the availability of comprehensive and up-to-date instruments for measuring disease-related knowledge are necessary. Following the implementation of a patient expert program in Spain, the need arose for an up-to-date and reasonably short questionnaire to assess patient knowledge about IBD and determine whether the educational program improved this knowledge. This study presents the development and validation of an up-to-date questionnaire to assess IBD-related knowledge in routine care.

PATIENTS AND METHODS

Study design, population and variables

This was a single-center, prospective study that included consecutive, regularly followed-up patients from the Crohn-Colitis Care Unit (UACC, according to its initials in Spanish) at Hospital Vall d’Hebron (Barcelona, Spain) between June and November 2017. Patients admitted to the UACC for the first time during this period were enrolled in a standard IBD educational program for newly diagnosed patients at the Hospital Vall d’Hebron. The educational program consisted of a structured 1.5-hour session that covered five themes from each individual patient perspective. These included disease definition, outbreak symptoms, diagnostic tests, treatment and living with IBD via a healthy lifestyle and 2.0 resources guide. Audiovisual materials were used as a teaching support. Patients were considered as “newly diagnosed” until six months after admission to the UACC and the educational program was scheduled during this period. In order to capture the real-life scenario of patients with IBD, no additional selection criteria were introduced aside from the UC/CD diagnosis. The study was conducted in two phases: a first phase of the development of a pilot questionnaire and a second phase of validation of the questionnaire. Demographic and clinical characteristics of the patients and the following variables were included in the study. Education level was also included and was defined as basic (Primary School), medium (High School) and high (college or university). Disease activity, which was defined according to standardized clinical indexes for UC (Walmsley SSchai) and CD (Harvey-Bradshaw index) was
categorized as active vs remission for scores > 4 and ≤ 4, respectively (20,21). All study participants signed an informed consent and the study was conducted in accordance with the Local Personal Data Protection Law (LOPD 15/1999). The study protocol was approved by the local independent ethics committee.

**Questionnaire development and validation**

The questionnaire was developed by selecting 25 items from a 38-item preliminary list drafted by a research team and by assessing its content validity in a reduced group of patients. The complete methods for questionnaire development are included in the supplementary methods (Annex 1).

The second phase of the study aimed to determine the feasibility of the questionnaire, internal consistency reliability, construct validity and sensitivity. To define its feasibility, the questionnaire was performed with 92 consecutive patients admitted to the UACC at the Hospital Vall d’Hebron. The time taken to complete the questionnaire was recorded and the ceiling and floor effects were calculated, which were defined as the percentage of patients with a score > 90% and < 10%, respectively. Internal consistency reliability was estimated using the Cronbach’s α coefficient (18). To determine its construct validity, a correlation between the scores from the QUECOMIICAT questionnaire and those obtained from two previously validated questionnaires was calculated. These were the Spanish version of the CCKNOW questionnaire (15), which consists of 24 items and rates patient knowledge on a 0-24 scale and a 0-100 visual analog scale (VAS) on a 10 cm-long line that evaluates self-perception of disease knowledge (22). While the CCKNOW is intended to determine IBD-related knowledge, the VAS scale is not specific for IBD. Higher scores for the two questionnaires meant better disease knowledge or perception. Sensitivity to changes of the QUECOMIICAT questionnaire was assessed in a subgroup of 20 newly diagnosed patients who participated in the study and were subsequently enrolled in a standard educational program for newly diagnosed patients at the Hospital Vall d’Hebron (under the Catalonia Expert Patient Program) between June and November 2017. These patients completed the QUECOMIICAT questionnaire
and the knowledge VAS before and one day and one month after taking part in the educational program. To further determine sensitivity, 33 healthy control volunteers who were acquaintances of the research team and not related with IBD patients (negative controls) also completed the QUECOMIICAT questionnaire. Their scores were compared to those obtained by the 92 IBD patients.

**Statistics**

Categorical variables were described as frequencies and percentages and quantitative variables were described as the median and interquartile range (IQR). The differences between the two groups were compared using the non-parametric Mann-Whitney test. Internal consistency reliability was determined using Cronbach’s α coefficient. To determine construct validity, the correlation between questionnaires was assessed using the non-parametric Spearman test and sensitivity was assessed using a repeated measures analysis of variance (ANOVA). Pearson’s correlation coefficient was used to determine the test-retest reliability. The significance threshold was set at a bilateral α level of 0.05. All analyses were performed using the GraphPad Prism software version 5.00 for Windows (GraphPad Software, La Jolla, California, USA).

**RESULTS**

**Validation of the QUECOMIICAT questionnaire: feasibility, reliability and construct validity**

The pilot QUECOMIICAT questionnaire was validated; the details of the questionnaire are included in supplementary results (Annex 1). The 92 selected patients successfully completed the questionnaire, in order to assess its feasibility, reliability and construct validity. Table 1 summarizes the demographic and clinical characteristics of these patients. There were no significant differences between the patients with UC and CD in terms of sex, education, disease duration and clinical activity. However, previous surgeries were significantly less frequent in the UC group (p < 0.01) and patients in this group were significantly older (p < 0.05). Patients completed the questionnaire in a
median (IQR) of 15 (10-20) minutes and floor and ceiling effects were 1.1% and 2.1%, respectively. The internal consistency reliability (Cronbach’s α) was α = 0.75. All patients successfully completed the questionnaires used to assess QUECOMIICAT construct validity. The median (IQR) scores obtained from QUECOMIICAT, the Spanish CCKNOW and knowledge VAS were 52 (36-68), 7 (4-11) and 65 (50-75), respectively. The QUECOMIICAT total scores showed a weak-to-moderate and a strong correlation (both significant) with VAS and CCKNOW total scores, respectively (Fig. 1).

With regard to patient and disease characteristics with a potential influence on disease knowledge, neither disease duration (onset vs > 6 years) nor education level (basic vs high) significantly influenced QUECOMIICAT global scores. The median (IQR) scores were 44 (37-70) and 48 (36-68) for newly diagnosed patients and those with > 6 years of disease progression, respectively (p = 0.583). In addition, the median (IQR) scores were 58 (36-69) and 58 (40-76) for patients with a basic and high education level, respectively (p = 0.750). Conversely, the median (IQR) global score was significantly higher in CD patients compared to UC patients: 64 (48-72) and 40 (32-66) for CD and UC, respectively (p = 0.001) (Fig. 2A). Likewise, scores from the clinic, treatment, surgery and habits domains were significantly higher in the CD group than in the UC group, whereas the scores from the knowledge and context dimensions were not significantly different (Fig. 2B). Differences in disease knowledge between CD and UC patients were also found using the CCKNOW, with mean (IQR) scores of 10 (6-12) and 6 (4-10), respectively (p = 0.011).

Validation of the QUECOMIICAT questionnaire: sensitivity

In order to evaluate the ability of QUECOMIICAT to detect changes in IBD knowledge, this questionnaire was performed together with knowledge VAS in 20 newly diagnosed patients enrolled in a standard IBD educational program for newly diagnosed patients. The program was performed by an IBD nurse at the Hospital Vall d’Hebron. Patient IBD knowledge, as measured by the QUECOMIICAT questionnaire and VAS, significantly increased 24 hours after attending the educational program and remained statistically
significant one month later (Fig. 3A and B). Accordingly, the Pearson’s test-retest reliability correlation coefficient was $r = 0.81$ ($p < 0.001$). To further evaluate the sensitivity of the questionnaire, QUECOMIICAT was performed in 33 healthy controls (negative controls). There were significantly lower scores in the control group compared to the IBD patients, both globally and in the general knowledge, clinic, treatment and lifestyle dimensions. Differences in the scores obtained in the surgery and social context dimensions were not statistically significant (Fig. 3C).

**DISCUSSION**

In this prospective study, the QUECOMIICAT questionnaire was developed and validated to assess patient knowledge about IBD. The questionnaire consists of 25 content-validated items that address six dimensions of IBD. There was a good feasibility (i.e., short completion time, with low ceiling and floor effects), internal consistency reliability (Cronbach’s $\alpha$ of 0.75) and it correlated well with the CCKNOW and the disease self-perception VAS questionnaires. QUECOMIICAT was developed for use in the routine clinical practice. Hence, feasibility (particularly completion time) was deemed an important psychometric property for this purpose. Our assessment of content validity indicated that 25 items were sufficient to capture all the essential aspects of disease knowledge. The length of the questionnaire is similar to that of previous questionnaires such as CCKNOW and KQ (24 and 36 items, respectively) (13,14). However, it is remarkably lower than the recently developed IBD-INFO questionnaire, which is an update of CCKNOW consisting of 65 items (16). Longer item lists allow more exhaustive assessments of patient knowledge but may compromise the feasibility of the questionnaire, particularly in the routine clinical practice. In fact, the median time required to fill in the IBD-INFO questionnaire was three times higher than that of QUECOMIICAT (43 minutes vs 15 minutes) (16).

Internal consistency reliability of QUECOMIICAT was assessed using the Cronbach’s $\alpha$ coefficient, which measures the extent to which each item response correlates with each other. The alpha value is influenced by various parameters, including the
questionnaire length and the relationship between the items. The acceptable value ranges from 0.70 to 0.95, depending on the intended use of the questionnaire (23,24). Therefore, an α value of 0.75 indicates that QUECOMIICAT has good internal consistency reliability.

Construct validity is typically assessed by investigating the correlation degree with other related and unrelated questionnaires (23). CCKNOW, the only chosen questionnaire, specifically assessed patient IBD-related knowledge and there was a strong (Spearman’s rho = 0.74) and significant correlation with QUECOMIICAT. Based on the fact that a lack of knowledge is an important concern for IBD patients (9,10), we also tested a VAS scale with regard to disease knowledge self-perception. The correlation between this scale and the QUECOMIICAT total score was significant, although weak to moderate (Spearman’s rho = 0.34). Overall, the correlation profile of QUECOMIICAT positively, significantly and strongly correlated with the Spanish version of CCKNOW. Thus, confirming its construct validity.

An important psychometric property that enables the assessment of the outcome of the Expert Patient Program was the sensitivity of the questionnaire. This property was assessed in a subset of newly diagnosed patients to prevent heterogeneity in the background knowledge of the disease, due to differences in progression time among the patients. Even though the adequacy of the educational program may influence the observed sensitivity, the total mean score of both the VAS and QUECOMIICAT questionnaires significantly increased after the educational program and was maintained over time.

Despite successful validations, a bias in QUECOMIICAT with regard to the diagnosis of CD and UC was identified. Since the questionnaire was developed to assess the performance of an educational program for IBD patients in general, QUECOMIICAT was conceived as a single questionnaire for both CD and UC patients. However, we found that CD patients obtained significantly higher scores than UC patients, particularly in the clinic, treatment, surgery and lifestyle domains. A similar trend was observed in this study using the CCKNOW and in previous studies using the KQ and CCKNOW.
questionnaires (14,25,26). A reasonable explanation for this bias is that CD patients are more likely to need surgical resection to treat disease complications in the regular clinical practice and are more often hospitalized than UC patients (2). Consequently, CD patients have more opportunities to interact with specialists and therefore, acquire disease knowledge. In fact, the frequency of surgeries was significantly higher in the CD group than in the UC group in this study. Two versions of this questionnaire may be tailored for CD and UC patients in the future in order to overcome this limitation of QUECOMIICAT as a tool to evaluate a general IBD educational program. In spite of this limitation, the patient population selected to validate the questionnaire was not subject to strict selection criteria and was therefore representative of the real-life scenario. Thus, warranting the validity of the data herein presented in other populations. For this reason, we believe that the QUECOMIICAT will be a suitable instrument to evaluate IBD-related knowledge in any population.

In conclusion, we developed the QUECOMIICAT questionnaire, which is a new up-to-date tool to assess disease-related knowledge of IBD patients. The questionnaire has shown good feasibility for use in the routine clinical practice and has good psychometric properties, including construct validity, internal consistency, sensitivity and test-retest reliability. Considering the increased interest in a patient-centered care model for the management of IBD, QUECOMIICAT may provide physicians with a feasible and validated instrument to assess disease knowledge of IBD patients. Furthermore, the impact of disease-specific educational programs may also be assessed.

ACKNOWLEDGEMENTS
The authors would like to acknowledge the i2e3 Biomedical Research Institute for providing medical writing assistance.


Table 1. Demographic and clinical characteristics of study patients who participated in the questionnaire validation

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>Overall (n = 92)</th>
<th>Ulcerative colitis (n = 51)</th>
<th>Crohn's disease (n = 41)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, median (IQR)</td>
<td>40.0 (29.0-53.7)</td>
<td>47.0 (33.0-57.0)</td>
<td>37.0 (27.0-49.5)</td>
</tr>
<tr>
<td>Sex, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>43 (46.8)</td>
<td>25 (49.1)</td>
<td>18 (44.0)</td>
</tr>
<tr>
<td>Females</td>
<td>49 (53.2)</td>
<td>26 (50.9)</td>
<td>23 (56.0)</td>
</tr>
<tr>
<td>Smoking status, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoker</td>
<td>21 (22.8)</td>
<td>9 (17.6)</td>
<td>12 (29.2)</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>71 (77.2)</td>
<td>42 (82.4)</td>
<td>29 (70.8)</td>
</tr>
<tr>
<td>Education, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic</td>
<td>14 (15.2)</td>
<td>7 (7.6)</td>
<td>7 (7.6)</td>
</tr>
<tr>
<td>Medium</td>
<td>22 (23.9)</td>
<td>8 (8.7)</td>
<td>14 (15.2)</td>
</tr>
<tr>
<td>High</td>
<td>54 (58.7)</td>
<td>34 (37.0)</td>
<td>20 (21.7)</td>
</tr>
<tr>
<td>Clinical characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disease duration (months), median (IQR)</td>
<td>91.5 (9-180)</td>
<td>96.0 (7-180)</td>
<td>87.0 (10-186)</td>
</tr>
<tr>
<td>Disease activity, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remission</td>
<td>59 (64.1)</td>
<td>31 (60.7)</td>
<td>28 (68.3)</td>
</tr>
<tr>
<td>Active</td>
<td>33 (35.9)</td>
<td>20 (39.3)</td>
<td>13 (31.7)</td>
</tr>
<tr>
<td>Surgery, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>19 (20.6)</td>
<td>3 (5.8)</td>
<td>16 (39.0)</td>
</tr>
<tr>
<td>No</td>
<td>73 (79.4)</td>
<td>48 (94.2)</td>
<td>25 (61.0)</td>
</tr>
</tbody>
</table>

IQR: interquartile range (percentile 25-percentile 75).
Fig. 1. Correlation between the scores obtained from the QUECOMIICAT questionnaire and the (A) knowledge VAS and (B) CCKNOW questionnaires. Rho and p-values correspond to the Spearman’s correlation test.
Fig. 2. Median global (A) and dimension (B) scores of the QUECOMICAT questionnaire in patients with ulcerative colitis and Crohn’s disease. Error bars correspond to interquartile range. *p < 0.05 and **p < 0.01 U Mann-Whitney test.
Fig. 3. Median scores from (A) the QUECOMICAT questionnaire and (B) knowledge VAS before, 24 hours and one month after attending the educational program for patients with inflammatory bowel disease. **p < 0.01 repeated measures ANOVA. C. Median global and dimension scores of the QUECOMICAT questionnaire in healthy controls and patients with IBD. Error bars correspond to interquartile range. *p < 0.05 and **p < 0.01 Mann-Whitney U test. IBD: inflammatory bowel disease.

Annex 1

SUPPLEMENTARY METHODS

Questionnaire development

The first stage of the questionnaire development was performed in May 2017. A research team that included four gastroenterologists, four nurses, one surgeon and one family physician (all of them members of the [blinded for peer-review]) drafted a preliminary item list based on the questionnaires available to date (13,14), as well as their personal experience managing IBD patients. The second stage of the
questionnaire development aimed to reduce the number of items. Each member of the research team and three patients with long-term, progressive IBD scored the relevance of each question on a scale of 1-10. Based on the mean relevance score of each question, the research team selected the 25 most relevant items. For each of the 25 selected questions, the research team generated four answers, ranging from lowest to best knowledge. Lowest knowledge was defined as “I don’t know” and was common to all items, and the remaining three answers were specific for each of the questions. The third stage consisted of an assessment of content validity by evaluating the comprehensibility of the questionnaire and the degree of coverage of the relevant aspects of the disease. Content validation involved eight patients with IBD disease duration at least six months, who analyzed all items by systematically answering the following questions: “Did you have any difficulties to understand the question?”, “What does the question mean to you?”, “Do you think this is an important question?” and “How would you formulate the question?” Patients also gave their general appraisal on the item list and were asked about essential aspects of disease knowledge that were missing from the questionnaire. The item list was modified according to patient response and suggestions. This resulted in a pilot Spanish version of the “Qüestionari Coneixements Malaltia Inflamatòria Intestinal Catalunya” (IBD-knowledge questionnaire Catalonia), named QUECOMIICAT.

**SUPPLEMENTARY RESULTS**

**Questionnaire development**

From an initial pool of 38 questions proposed, the research team and three patients (blinded for peer-review) selected 25 items that addressed knowledge in six dimensions: general concepts (four items), clinic (five items), treatment (four items), surgery (three items), habits (five items) and social context (four items). This rated disease knowledge on a scale of 0-100, where lower values meant a poorer knowledge. Content validation was performed in a group of eight patients, whose demographics and clinical characteristics are summarized in supplementary
Following the suggestions of the patients, five items were slightly modified to improve their comprehensibility, resulting in a content-validated, 25-item pilot questionnaire named QUECOMIICAT. All the items included in the QUECOMIICAT were newly-formulated questions, of which only eight (out of the 25) covered contents that were included in previous questionnaires (i.e., the CCKNOW). These include diary, residues in diet, extra-intestinal manifestations, fistula, corticoids, pregnancy, epidemiology and colon cancer. Six questions are shown here as an example.

Choose the correct answer:

**Regarding diet and IBD:**

a. Fiber and diary consumption should be avoided.
b. Consumption of fiber-rich foods in excess could be the cause of the disease.
c. No specific diet exists.
d. I do not know.

**In inflammatory bowel disease:**

a. There may be manifestations outside the intestine, both in Crohn’s disease and in ulcerative colitis.
b. There may be manifestations outside the intestine only in Crohn’s disease.
c. There may be manifestations outside the intestine only in ulcerative colitis.
d. I do not know.

**The most frequent extraintestinal manifestation is that which affects:**

a. The joints.
b. The skin.
c. The eyes.
d. I do not know.

**Regarding the possible complications of Crohn’s disease:**

a. Intestinal obstruction is one of the most frequent.
b. They never require surgical treatment.
c. No complications occur in Crohn’s disease.
d. I do not know.

Regarding the risk of colon cancer in inflammatory bowel disease:

a. Inflammatory bowel disease does not increase the risk of colon cancer.
b. Good control of the disease decreases the risk of colon cancer.
c. Colonic Crohn’s disease does not increase the risk of colon cancer.
d. I do not know.

The treatment of inflammatory bowel disease:

a. It is the same for everyone, regardless of the degree of the disease.
b. It can be purchased without a prescription in the pharmacy.
c. It is different depending on the type and degree of the disease.
d. I do not know the answer.

The QUECOMIICAT questionnaire was in Spanish. The total score of the questionnaire, based on a scale of 0-100, was obtained by multiplying each item score by 4 and the results for each dimension are calculated as follows: sum*100/No. of items.
**Supplementary table 1. Demographic and clinical characteristics of study patients involved in the content validation of the questionnaire**

<table>
<thead>
<tr>
<th>Patient no.</th>
<th>Sex</th>
<th>Age (years)</th>
<th>Diagnosis</th>
<th>Location</th>
<th>Disease duration (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Female</td>
<td>29</td>
<td>CD</td>
<td>Ileum</td>
<td>36</td>
</tr>
<tr>
<td>2</td>
<td>Male</td>
<td>16</td>
<td>CD</td>
<td>Ileum</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>Female</td>
<td>36</td>
<td>UC</td>
<td>Pancolitis</td>
<td>84</td>
</tr>
<tr>
<td>4</td>
<td>Female</td>
<td>40</td>
<td>CD</td>
<td>Ileocolon</td>
<td>204</td>
</tr>
<tr>
<td>5</td>
<td>Female</td>
<td>38</td>
<td>CD</td>
<td>Colon</td>
<td>120</td>
</tr>
<tr>
<td>6</td>
<td>Male</td>
<td>37</td>
<td>UC</td>
<td>Pancolitis</td>
<td>60</td>
</tr>
<tr>
<td>7</td>
<td>Female</td>
<td>32</td>
<td>CD</td>
<td>Ileum</td>
<td>96</td>
</tr>
<tr>
<td>8</td>
<td>Female</td>
<td>48</td>
<td>CD</td>
<td>Ileocolon</td>
<td>90</td>
</tr>
</tbody>
</table>

CD: Crohn's disease; UC: ulcerative colitis.