A Prospective, Longitudinal, Multicenter, Cohort Quality-of-Life Evaluation of an Intensive Follow-up Program for Patients with a Stoma

Paloma de la Quintana Jiménez, RN; Catalina Pastor Juan, RN; Isabel Prados Herrero, RN; Concepción Pérez López, RN; Margarita González Fuentes, RN; Carmen de Mena Casasesca, RN; Arcadio Real Romaguera, RN; Montserrat Tejido Valenti, RN; Josep M. Garcia-Alamino, RN; and Brigitte Espirac, MD; on behalf of Grupo Cooperativo Estudio Calidad de Vida

Abstract
The creation of a stoma can profoundly affect a patient’s quality of life. A prospective, 3-month multicenter study was conducted to evaluate stoma patient quality of life among volunteers receiving standard clinical follow-up (S) and those receiving intensive follow-up via telephone (I). A total of 336 patients volunteered to participate; 187 in the S group and 149 in the I group; mean age 63±14 years, 65.85% male; the majority (64.3%) had a colostomy. The Stoma Quality of Life Index (SQLI) score was determined at the initial and final visits. No statistically significant difference between the I and S groups was found at baseline except for the subcategory social concerns ($P = 0.0123$). At 3 months, statistically significant changes were observed between the overall SQLI score of both groups — scores were 58.8 (17.7) and 72.8 (14.6) at baseline and 3 months, respectively ($P < 0.0001$); in particular, for the subcategories patient satisfaction ($P = 0.0173$) and medical experience ($P = 0.0330$). Patients in the I group showed a positive but not statistically significant change in three subscales of the SQLI questionnaire; the I group presented slightly lower differences in the percentage of complications related to the stoma, need for emergency assistance, and for hospitalization. Differences in quality-of-life perceptions also were reflected among geographic areas. Preoperative ostomy nurse care was found to be associated with a greater probability for improvement in select SQLI subscales. The results of this study confirm that personal support and help received pre- and post surgery from ostomy care nurses may enhance ostomate overall quality of life and when additional intensive follow-up was introduced, certain aspects of quality of life improved. The study underscores the need for clinician awareness of their role in patient quality of life.

Key Words: ostomy care, cohort study, intensive follow-up, enterostomal, quality of life.

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Potential Conflicts of Interest: Mr Garcia-Alamino and Dr Espirac are members of the medical department of ConvaTec (Spain). They were involved during the phase of protocol study redaction but not during the monitoring, analysis of results, and elaboration of the final report, which was done by an external agency.
In 2000, approximately 32,000 people in Spain had surgical stomas. The most common underlying conditions requiring this procedure worldwide and in Spain are colorectal cancer, bladder cancer, ulcerative colitis, and Crohn’s disease. Reports in the literature indicate that stomas usually have a negative impact on patient quality of life and affect lifestyle in a number of ways. The ostomy patient needs encouragement, support, and counseling to learn how to integrate stoma self-care into daily activities. Several prospective, randomized trials have demonstrated that intensive follow-up of patients that includes more frequent follow-up visits, risk-adapted follow-up, and adding computed tomography and other testing to simple surveillance in persons with chronic conditions, especially stomas, improves their health through earlier detection of recurrence, decreasing the rate of re-operation, and improving diagnosis and prognosis. Specially trained nurses can play a key role in the pre- and postoperative care of ostomy patients and according to Baxter and Salter, nurses can help ostomy patients cope with life with a stoma, exerting a positive influence on their quality of life.

A quality-of-life study and a review of the literature have found that major changes in physical appearance and bodily function after surgery can compromise quality of life. The Montreux Study conducted in Europe (1994–1999) was the first international, multicenter study (N = 4,739) conducted to examine the effects of time on the quality of life of patients with a permanent stoma. In the course of this research, a quality-of-life assessment tool — the Stoma Quality of Life Index (SQLI) — was developed to enable enterostomal therapy nurses to audit their service, assess their performance, and identify issues affecting patient quality of life. The Montreux Study concluded three factors affect quality of life in patients with a permanent stoma: 1) satisfaction with the care received, 2) confidence in self-care, and 3) a trusting and therapeutic relationship with the enterostomal therapy nurse. The results of the study appear to substantiate the belief that enterostomal therapy nurses are of great importance in the treatment and support of ostomy patients, especially if patients have access to specialist care for 3 to 6 months following surgery.

Studies assessing the psychological and social impact of stoma surgery on a person’s life have not been conducted in Spain. A prospective, multicenter study was conducted by general nurses and ostomy care nurses to evaluate the impact of a system of intensive follow-up by means of telephone (from here on referred to as PatientFeedback® [PF]) on the quality of life of patients with a stoma. Secondary study objectives were to 1) describe the quality of life of patients with a stoma and 2) determine which factors have the greatest influence on patient quality of life.

### Methods and Procedures

A prospective, longitudinal, cohort, 3-month multicenter study was conducted at 70 Spanish general hospitals (89% urban, 11% rural). General nurses and ostomy care nurses screened patients and recruited study volunteers from ambulatory (outpatient) clinics between November 2005 and November 2006.

**Participants.** To be eligible for study participation, patients had to be >18 years of age, ambulatory, able to communicate verbally and in writing, and have a new colo-, ileo-, or urostomy that is permanent or to be maintained for at least 3 months. Hospitalized patients with an ostomy were excluded. The study protocol was approved by the ethical review boards of Hospital Clinic and Hospital Bellvitge of Barcelona and all participants provided written informed consent.

**Instruments used.** The SQLI, used and validated in the Montreux Study, was considered the most appropriate because this questionnaire specifically assesses stoma patient quality of life. The SQLI is a multidimensional, 34-item questionnaire divided into 13 subscales: psychological well-being; physical well-being; body image; pain; sexual activity (sufficient to meet the ostomate’s needs); nutrition; social concerns; handling (how well the person is coping); patient satisfaction; improvement (some things about medical care could be better); medical experience (some physicians lack experience with the individual’s medical problems); self-efficacy; and help and advice (how confident is the patient about obtaining advice or assistance when necessary). Each item is answered on a 6-point rating scale with end points (0 or 5) labeled with opposite extreme responses (e.g., “none at all” versus “a great deal”, “extremely poor” versus “excellent”). Scores are linearly transformed to provide ranges from 0 to 100. The SQLI questionnaire has been validated in 16 countries in Europe including Spain in terms of reliability (the extent to which a test...
b. Personal hygiene, general working of ostomy appliance:
- Do you change the pouch daily and do you do your daily ostomy care by yourself?  
  YES NO
- If the answer is NO: Who is helping you?  
  (Your spouse/nurse/relatives/others)
- What kind of pouch do you use?  
  One-piece Two-piece
- If you wear a pouch, please identify the brand name (ConvaTec®, Coloplast®, B Braun®, Hollister®, Igrobes®)

From second phone call
- Are you still using the appliance you used when discharged from the hospital?  
  YES NO

effectively measures anything at all), validity (the extent to which a test measures that which it is supposed to measure), and sensitivity to change (the capacity of a measure to detect change in patients’ functional status over time). This paper-and-pencil questionnaire can be completed in a few minutes and is self-administered.

For the initial assessment, a patient history and stoma information were obtained and recorded by the investigators and the following variables were obtained: general demographic information (e.g., gender, age), type of surgery, concomitant diseases, stoma characteristics (type, temporary-permanent, and open or closed stoma), and medical history, including ostomy appliances used and stoma complications.

**Study method.** Following the initial assessment, study volunteers were asked to complete the SQLI questionnaire. All participants continued their standard clinical follow-up (based on medical criteria or/and patient’s needs) between the initial and final (3-month) visit and were asked if they would be interested in receiving PF service, which consisted of receiving three follow-up telephone calls and answering a PF phone questionnaire (see Figure 1).

Study participants who volunteered to participate in the PF service (intensive follow-up group [I]) received phone calls at intervals of 20, 40, and 70 days after inclusion in the study. Trained personnel from a specialized call center contacted the study participants and collected the information, including patient concerns and comments. The data collected were sent to each investigator to apprise him/her of patient status and, if necessary, for subsequent patient contact to offer advice. Three months following completion of the first SQLI questionnaire, researchers met individually with all participants (standard care [S] — as per individual facility protocol — and I group). During this final visit, the investigators reviewed the patient history (including appliance usage and complications during the 3-month study period) and patients again completed the SQLI questionnaire.

**Statistical analysis.** The SQLI questionnaires were scored according to the method used in The Montreux Study.10 A combined score, called SQLI score, was generated from the quality of life-related questions, which gave the best overall information regarding patients’ quality of life. Frequency distributions of demographic variables were obtained and the distribution of quantitative variables described using mean and standard deviation. Qualitative variables were analyzed by chi-square or Fisher tests. For quantitative variables, Student’s *t*-test was performed to test for statistically significant differences between the study groups (when proceed variance analyses were performed) or paired Student’s *t*-test to test change between evaluations. Nonparametric tests (Wilcoxon two-sample test or Kruskal-Wallis, nonpaired or paired) were used when some variables did not conform to a normal distribution.

A *P* value of <0.05 was considered to be statistically significant for all tests. All analyses were performed using SAS® for Windows® statistical software, version 8.02 (SAS, Cary, NC, USA).

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**Figure 1. PF phone questionnaire.**

- What kind of ostomy do you have?  
  Colostomy Ileostomy Urostomy Other

a. Daily life/personal relationships:
- Why do you leave your home ....?  
  Only for medical appointment  
  To go for a walk alone or with a friend  
  To go to the cinema/or shopping  
  To be with friends or relatives  
  None of the previous answers

- Are you on a special diet?  
  YES NO

- How is your appetite and liquid consumption compared to before the surgery?  
  Much better Good I follow what is recommended  
  Somewhat worse Very bad

- How is your feces consistency? (only in colostomy / ileostomy cases)  
  Liquid Half-liquid Soft  
  Half-soft Solid I have constipation

- How is your urine? (only in urostomy cases)  
  More urine volume Less urine volume  
  Does the urine have normal color?  
  YES NO What color?__________

b. Personal hygiene, general working of ostomy appliance:
- Do you change the pouch daily and do you do your daily ostomy care by yourself?  
  YES NO
- If the answer is NO: Who is helping you?  
  (Your spouse/nurse/relatives/others)
- What kind of pouch do you use?  
  One-piece Two-piece
- If you wear a pouch, please identify the brand name (ConvaTec®, Coloplast®, B Braun®, Hollister®, Igrobes®)

From second phone call
- Are you still using the appliance you used when discharged from the hospital?  
  YES NO

*Continued on next page*
Results

Patient characteristics. Of the 465 patients with temporary or permanent stomas screened, 336 met the study inclusion criteria and completed 3 months of follow-up. No sample selection bias was detected.

The average age of the 336 patients who completed the study was 63.14 years and 221 (65.85%) were men. The S group comprised 187 and the I group included 149 patients (see Table 1). The most common pre-existing disease requiring surgery was carcinoma. Cardiovascular conditions were the most commonly noted concurrent disease (14.6% [16.0% in the group S and 12.8% in the group I; \( P = 0.3958 \)), followed by respiratory and rheumatic disorders. No statistically significant differences were found between the two study groups related to the type of illness requiring ostomy, type of surgery, presence of postoperative complications, and type of appliance used. Less than half (34.8%) of all patients received a preoperative visit by an enterostomal therapy nurse — 28.9% in the I and 39.6% in the S group (\( P < 0.05 \)).

The majority of patients in both groups (216, 64.2%) had a colostomy, 86 (25.6%) had an ileostomy, and 34 (10.1%) had a urostomy. Of all the ostomies, 136 (40.5%) were temporary (in place for at least 3 months) and 195 (58.0%) were permanent. When comparing the I and S groups, the percentage of patients with a colostomy or urostomy was significantly higher in the I group (68.3% versus 61.0% for colostomies and 14.1% versus 7.0% for urostomies, respectively; \( P = 0.0027 \); chi-square). The percentage of patients with a permanent stoma was also significantly higher in the I than the S group (64.4% versus 52.9%, respectively; \( P = 0.0346 \); chi-square).

Appliance change. No statistically significant differences were found between the I and S group in the number of patients who changed the type of appliance — eg, from one- to two-piece they used during the study. The percentage of colostomy/ileostomy patients who changed appliance type was 28.9% in the I and 24.3% in the S group (\( P = 0.3730 \)). In the urostomy patient group, 33.3% of I and 25.0% of S group participants changed appliances (\( P = 0.7098 \)).

Complications. The incidence of complications related to the stoma as reflected in the need for emergency assistance or for hospitalization during the 3 months of follow-up was slightly lower in the I group (31 out of 149, 20.8%) than in the S group (54 out of 187, 28.9%). After 3 months of monitoring, dermatitis and retraction were the most frequent complications in both groups occurring in 14.0% and 19.3% in S and 12.3% and 7% in the I group, respectively.

Stoma Quality of Life Index

For all the questions, the maximum number of missing responses in both groups was eight, with the exception of the question about sexual activity (42 participants did not complete this question). At baseline, the average SQLI score was 58.5 (SD 17.7) in the S group. The only significant difference in baseline scores was seen in the social concerns domain. The average I group social concern scores (85.5, SD 17.7) were significantly higher than the S group scores (79.5 [SD 21.6], \( P = 0.0123 \), Wilcoxon two-sample test).

After 3 months, the combined data from both groups showed a statistically significant increase in the overall SQLI score (14, [SD 17.8]; \( P < 0.0001 \); Wilcoxon paired test) except in the subscales improvement of medical care received and medical experience. However, both subscales received satisfactory scores (68.4 ± 33.3 and 80 ± 30.5, respectively). The greatest change (+19.9 ± 28.5) was observed in the subscale self-efficacy and the smallest change was noted in help and advice (+3.6 ± 17.1) (\( P < 0.0001 \); Wilcoxon paired test).

The overall change in SQLI scores was not significantly different between the two groups (see Table 2).

SQLI scores changes by patient and stoma characteristics. Differences in score changes from baseline at the 3-month follow-up also were observed for patients in different geographical areas. SQLI changes were greater for patients in the South-Islands area than those in the other three geographical areas (Centre-North [CN], Mediterranean [Me], and Madrid [Ma]). The differences were in changes in three subscales of the questionnaire: psychological well-being (South Islands [SI]: 16.5, CN: 15.4, Ma: 10.8, Me: 7; \( P = 0.0186 \)); physical well-being (SI: 22.7, CN: 17.7, Ma: 14.6, Me: 12.2; \( P = 0.0036 \)); and pain (SI: 19, CN: 10.6, Ma: 11.5, Me: 6.1; \( P = 0.0318 \), variance analysis).

A history of a preoperative ostomy care nurse visits was found to be associated with a greater probability of improvement in the subscales physical well being, nutrition, and social concerns (odds ratio [OR] =1.895, \( P = 0.0280 \); OR =
A history of cancer was associated with a lower probability of improving the psychological well-being subscale (OR = 0.557, \( P = 0.0313 \)), physical well-being subscale (OR = 0.496, \( P = 0.0234 \)), nutrition subscale (OR = 0.463, \( P = 0.0060 \)), social concerns subscale (OR = 0.623, \( P = 0.0532 \)), and help and advice subscale (OR = 0.548, \( P = 0.0161 \)) (see Table 3).

**Discussion**

Telemonitoring, such as the ostomy patient follow-up system used in this study, is a recent development in healthcare that offers new ways to manage chronic clinical conditions. Recognition is growing that patient-reported outcome measures — eg, health-related quality of life — can complement traditional biomedical outcome measures (eg, survival, disease-free survival). In addition, quality of life is increasingly regarded as an important end point, especially for the management of patients with a stoma. A review of the literature found 10 studies in which stoma formation significantly affected the patient’s quality of life, independent of the survey instrument used.

In the present study, cancer patients reported significantly lower probabilities than noncancer patients of improvements in quality-of-life scores in the subscales psychological well-being, physical well-being, nutrition, and help and advice. Krouse et al and Sprangers et al observed that patients with cancer and a stoma had a better overall quality of life than persons with benign processes, but problems and concerns were common to all colostomy patients.

Although the analyses with regard to body image, handling, and self-efficacy did not show statistically significant differences between the patients in the S and I groups, studies by Turnbull et al and Kjeldsen et al have found that intensive follow-up of patients with chronic conditions has been found to positively influence their health status, although knowledge about the most effective follow-up methods and procedures is limited. In this study, the S group scores improved more from initial visit to follow-up in the subscales

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**Table 1. Patient characteristics and history**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Standard Group* (S)</th>
<th>Intensive Follow-up Group* (I)</th>
<th>( P ) value&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample size (%)</td>
<td>187 (55.7)</td>
<td>149 (44.3)</td>
<td>0.1517</td>
</tr>
<tr>
<td>Age, years (mean±SD)</td>
<td>64±14</td>
<td>61±14</td>
<td>0.0161</td>
</tr>
<tr>
<td>Male gender</td>
<td>117 (62.6)</td>
<td>104 (69.8)</td>
<td></td>
</tr>
<tr>
<td>Marital status,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>101 (54.0)</td>
<td>85 (57.0)</td>
<td></td>
</tr>
<tr>
<td>Family</td>
<td>73 (39.0)</td>
<td>44 (29.5)</td>
<td>0.0555</td>
</tr>
<tr>
<td>Single</td>
<td>11 (5.9)</td>
<td>19 (12.8)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>1 (0.5)</td>
<td>1 (0.7)</td>
<td></td>
</tr>
<tr>
<td>Employment status,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>42 (22.5)</td>
<td>30 (20.1)</td>
<td></td>
</tr>
<tr>
<td>Part-time</td>
<td>7 (3.7)</td>
<td>8 (5.4)</td>
<td>0.8621</td>
</tr>
<tr>
<td>Unemployed/homemaker</td>
<td>34 (18.2)</td>
<td>27 (18.1)</td>
<td></td>
</tr>
<tr>
<td>Retired/pensioner</td>
<td>98 (52.4)</td>
<td>81 (54.4)</td>
<td></td>
</tr>
<tr>
<td>Malignant diagnosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carcinoma</td>
<td>129 (69.0)</td>
<td>106 (71.1)</td>
<td>0.6684</td>
</tr>
<tr>
<td>Metastasis</td>
<td>34 (26.4)</td>
<td>18 (12.1)</td>
<td>0.0891</td>
</tr>
<tr>
<td>Benign diagnosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crohn’s disease</td>
<td>8 (4.3)</td>
<td>7 (4.7)</td>
<td>0.8531</td>
</tr>
<tr>
<td>Ulcerative colitis</td>
<td>9 (4.8)</td>
<td>2 (1.3)</td>
<td>0.1205</td>
</tr>
<tr>
<td>Other</td>
<td>28 (15.0)</td>
<td>18 (12.1)</td>
<td>0.4435</td>
</tr>
<tr>
<td>Surgery type</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Elective</td>
<td>122 (65.2)</td>
<td>104 (69.8)</td>
<td>0.2804</td>
</tr>
<tr>
<td>Emergency</td>
<td>61 (32.6)</td>
<td>40 (26.8)</td>
<td></td>
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<tr>
<td>Postoperative complications</td>
<td>54 (28.9)</td>
<td>31 (20.8)</td>
<td>0.0909</td>
</tr>
<tr>
<td>Non-concurrent illness</td>
<td>111 (59.4)</td>
<td>85 (57.0)</td>
<td>0.6694</td>
</tr>
<tr>
<td>Preoperative ostomy care nurse visit</td>
<td>74 (39.6)</td>
<td>43 (28.9)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.0406</td>
</tr>
<tr>
<td>Stoma type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colostomy</td>
<td>114 (61.0)</td>
<td>102 (68.5)&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Ileostomy</td>
<td>60 (32.1)</td>
<td>26 (17.4)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.0027</td>
</tr>
<tr>
<td>Urostomy</td>
<td>13 (7.0)</td>
<td>21 (14.1)&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Stoma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporary</td>
<td>85 (45.5)</td>
<td>51 (34.2)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.0346</td>
</tr>
<tr>
<td>Permanent</td>
<td>99 (52.9)</td>
<td>96 (64.4)&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Ostomy appliance type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colostomy/ Ileostomy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>one-piece</td>
<td>113 (65.6)</td>
<td>94 (74.6)</td>
<td>0.0512</td>
</tr>
<tr>
<td>two-piece</td>
<td>55 (31.9)</td>
<td>29 (23.0)</td>
<td></td>
</tr>
<tr>
<td>one-piece plus two-piece</td>
<td>4 (2.3)</td>
<td>3 (2.4)</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Values are number (percent) or mean±SD.

<sup>b</sup> Wilcoxon Two-Sample, Chi-square or Fisher’s exact test.

<sup>c</sup> \( P \leq 0.05 \) Intensive follow-up group versus standard group (unpaired test).
nutrition, social concerns, patient satisfaction with the medical care received, improvement in medical care, and medical experience. One explanation for these findings may be that the I group included more patients with carcinoma and permanent stomas as well as persons who did not have a preoperative visit with a stoma care nurse. Additionally, in this study, preoperative stoma care nurse visits improved the odds of increases in physical well-being, nutrition, and social concern scores. These findings confirm those of Bass et al. and corroborate the importance of these preoperative visits reported in The Montreux Study. Although beyond the scope of this study, the observed differences between the S and I group with respect to their medical care could be related to a correlation between the absence of a preoperative stoma care nurse visit and the overall quality of stoma/medical care in a particular facility.

Other findings from this study were very similar to those reported in the Montreux study. Participant average age, gender, type of surgery, history of carcinoma, and presence of concurrent illness were very similar. The average SQLI scores in the Montreux study were 73.30 at 3 months, compared to 72.8 in this study.

Patients in the South-Islands area showed more statistically significant changes than those in the other three geographical areas. The differences were in three subscales of the questionnaire: psychological well-being, physical well-being, and pain. These differences were not explored and could have been spurious results.

The suggestion by Dukes in 1947 that counseling, including preoperative care, is an important component of

**Table 2. Change in Stoma Quality of Life Index scores after 3 months**

<table>
<thead>
<tr>
<th>Scales of SQLI</th>
<th>Standard group* (S)</th>
<th>Intensive group (I)</th>
<th>P value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of life index</td>
<td>14.5±18.1</td>
<td>13.5±17.4</td>
<td>0.6222</td>
</tr>
<tr>
<td>Psychological well-being</td>
<td>12.9±23.3</td>
<td>12.4±22.2</td>
<td>0.7017</td>
</tr>
<tr>
<td>Physical well-being</td>
<td>17.9±21.2</td>
<td>16.5±22.2</td>
<td>0.5747</td>
</tr>
<tr>
<td>Body image</td>
<td>16.1±26.8</td>
<td>17.3±25.3</td>
<td>0.7399</td>
</tr>
<tr>
<td>Pain</td>
<td>12.9±27.3</td>
<td>12.7±25.7</td>
<td>0.7268</td>
</tr>
<tr>
<td>Sexual activity</td>
<td>10.4±37.5</td>
<td>10.4±36</td>
<td>0.6318</td>
</tr>
<tr>
<td>Nutrition</td>
<td>13.8±24.4</td>
<td>10.9±22</td>
<td>0.2418</td>
</tr>
<tr>
<td>Social concerns</td>
<td>9.3±21.4</td>
<td>4.7±19.6</td>
<td>0.0677</td>
</tr>
<tr>
<td>Handling</td>
<td>13.5±33.4</td>
<td>15.5±27.5</td>
<td>0.6028</td>
</tr>
<tr>
<td>Satisfaction with medical care</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient satisfaction</td>
<td>8.6±24.4</td>
<td>2.4±15.3</td>
<td>0.0173</td>
</tr>
<tr>
<td>Improvement</td>
<td>6.4±40.6</td>
<td>-1.4±39.1</td>
<td>0.1026</td>
</tr>
<tr>
<td>Medical experience</td>
<td>1.9±38</td>
<td>-3.3±37.7</td>
<td>0.0330</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>17.9±27.4</td>
<td>22.5±29.8</td>
<td>0.3653</td>
</tr>
<tr>
<td>Help and advice</td>
<td>9.8±32.9</td>
<td>9.9±30.9</td>
<td>0.5598</td>
</tr>
</tbody>
</table>

* Wilcoxon test, t-test, as appropriate

**Table 3. Probability of Stoma Quality of Life Index subscale improvement by patient history/characteristic**

<table>
<thead>
<tr>
<th>Subscales of SQLI</th>
<th>Number (%) of patients improved</th>
<th>Preoperative stoma care nurse visit</th>
<th>Carcinoma present</th>
<th>Use of appliance with adhesive coupling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological well-being</td>
<td>226 (67.3)</td>
<td>1.895 (1.071-3.351)</td>
<td>0.557 (0.327-0.949)</td>
<td>0.284 (0.111-0.730)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P = 0.0313</td>
<td>P = 0.0313</td>
<td></td>
</tr>
<tr>
<td>Physical well-being</td>
<td>250 (74.4)</td>
<td>1.957 (1.057-3.631)</td>
<td>0.496 (0.270-0.909)</td>
<td>1.924 (1.134-3.264)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P = 0.0280</td>
<td>P = 0.0090</td>
<td></td>
</tr>
<tr>
<td>Nutrition</td>
<td>211 (62.8)</td>
<td>2.571 (1.533-4.313)</td>
<td>0.463 (0.267-0.801)</td>
<td>1.924 (1.134-3.264)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P = 0.0003</td>
<td>P = 0.0060</td>
<td></td>
</tr>
<tr>
<td>Social concerns</td>
<td>154 (45.8)</td>
<td>2.143 (1.350-3.402)</td>
<td>0.623 (0.386-1.007)</td>
<td>0.214 (0.049-0.934)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P = 0.0012</td>
<td>P = 0.0532</td>
<td></td>
</tr>
<tr>
<td>Patient satisfaction</td>
<td>119 (35.4)</td>
<td>1.384 (0.866-2.212)</td>
<td>0.548 (0.335-0.894)</td>
<td>0.214 (0.049-0.934)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P = 0.1747</td>
<td>P = 0.0403</td>
<td></td>
</tr>
<tr>
<td>Improvement medical care</td>
<td>106 (31.6)</td>
<td>1.384 (0.866-2.212)</td>
<td>0.548 (0.335-0.894)</td>
<td>0.0161</td>
</tr>
<tr>
<td>Help and advice</td>
<td>105 (31.3)</td>
<td>1.384 (0.866-2.212)</td>
<td>0.548 (0.335-0.894)</td>
<td>0.0161</td>
</tr>
</tbody>
</table>

Data are expressed as odds ratio, OR (95% confidence interval, IC)
Table 4. Members of the Grupo Cooperativo Estudio Calidad de Vida

Edurne Aguirre Erro Hosp. San Eloy, Barakaldo
Eloïsa Ajuria Imaz Hosp. Virgen de las Nieves, Granada
Rosario Alonso Fernández Hosp. La Paz, Madrid
Rosa Mª Anaya Fernández Hosp. Clínico San Cecilio, Granada
Mª Dolores Antón López Hosp. General Universitario de Elche, Alicante
Mª Encina Arias Alvarez Hosp. Univ. Príncipe de Asturias, Alcalá de Henares, Madrid
Eugenio Barrio Martín Hosp. Univ. Ramón y Cajal, Madrid
Ana Mª Bravo Esteban Fundación Hospital Alcorcón, Madrid
Mª de las Mercedes Caballero Ruiz Hosp. Univ. La Princesa, Madrid
Mª Angels Caldes Brichleus Clínica Sagrada Familia, Barcelona
Mª Teresa Camba Cammarillo Hosp. Univ. de Móstoles, Madrid
Fco. Antonio Cano Gálvez Hosp. Univ. Carlos Haya, Málaga
Rosa Mª Carvajal Muñoz Hosp. Univ. de Móstoles, Madrid
Pilar Castellano Muñoz Hosp. Costa del Sol de Marbella, Málaga
Dolores Codinach Folcra Hosp. Gral. de Manresa, Barcelona
Cándida Corral Tejer Hosp. Univ. 12 de Octubre, Madrid
Irene Cots Moral Hosp. Mutua de Terrassa, Barcelona
Silvia de Aribita Amado Hosp. Univ. 12 de Octubre, Madrid
Paloma De la Quintana Jiménez Hosp. Univ. La Paz, Madrid
Carmen De Ma Casaseca Hosp. San Juan, Alicante
Sagrario Del Corral Gómez Fundación Hospital Alcorcón, Madrid
Silvia Egea González Hosp. de Antequera, Málaga
Mª Carmen Exposito Álvarez Hosp. Antequera, Málaga
Rosa Mª Fernández Paz Hosp. Arquitecto Mancio, El Ferrol, La Coruña
Ampero Fernández Rodríguez Hosp. de Jerez, Jerez
Defina Ferreiro Salgado Hosp. Univ. La Princesa, Madrid
José Luis Ferreiras Sánchez CHOP Hosp. Montecelo, Pontevedra
Mª Isabel Fondevila Fragüet Hosp. Amurri de Villanueva, Lérida
Inmaculada García Cuadrado Hosp. Ntra. Sra. del Prado, Toledo
Mª Eugenia García Garrido Hosp. SAS Jerez de la Frontera, Cádiz
Lidón García Rambla Hosp. General de Castellón, Castellón
Vicente García Rodríguez Hosp. General de Valencia, Valencia
Ana Mª González Buenadicha Hosp.Univ. Princesa (C.E. Jaime Vera), Madrid
Margarita González Fuentes Hosp. Univ. Reina Sofia, Murcia
Eloïsa González García Hosp. Juan Ramón Jiménez, Huelva
Joan Anton González Valero Fundación Sanitaria de Iguálica, Barcelona
Encarnación Guerrero Fernández-Marcote Hosp. Clínico Univ. San Cecilio, Granada
Mª Angeles Herrada Rodríguez Clínica del Pontent, Lleida
Pilar Herráiz Luján Hosp. Virgen de la Luz, Cuenca
Gregorio Huidobro Bajo Hosp. Univ. Ramón y Cajal, Madrid
Constantina Juan Ballina Hosp. Clínico Univ. de Valencia, Valencia
Millagros Jurado Rumi C.C. Príncipe de Viana, Pamplona
Rosa Mª Lorente Herranz Hosp. General de Segovia, Segovia
Carmen López Medina Hosp. Antequera, Málaga
Isabel Machado Calzo Hosp. del Antequera, Málaga
Yolanda Marchón Muñoz C. S. Pintor Oliva, Palencia
Mª Amparo Mañé Lacuera Hosp. Univ. La Fe, Valencia
Mª Carmen Martínez Costa Hosp. Univ. Virgen Macarena, Sevilla
Mª Soconro Martínez de Irujo C.C. Príncipe de Viana, Pamplona
Mª Angeles Martínez Hortal Hosp. Can Misses, Ibiza
Nieves Martínez Moya Hosp. Clínico Univ. San Cecilio, Granada
Mª Lourdes Martos Torres Hosp. General Alcante, Alicante
Mercedes Medina Muñoz Hosp. Univ. Puerta del Mar, Cádiz
Isabel Menéndez Muñoz Hosp. Univ. Reina Sofia, Córdoba
Pedro Miguel León Pérez Hosp. San Agustín de Linares, Jaén
Juan Mireya Saiz Hosp. Univ. 12 Octubre, Madrid
Carmen Mojariela Urra Hosp. San Juan De La Cruz de Ubeda, Jaén
José Miguel Mola Tallada Hosp. Univ. 12 de Octubre, Madrid
Pilar Mora Sánchez Hosp. Santa Creu i Sant Pau, Barcelona
Esthefía Muñoz Malagarriga Hosp. Univ. Morales Meseguer, Murcia
Mª Dolores Navarro Ortiz MD Andersen Internacional Española, Madrid
Esther Ordoñez Bravo Hosp. Univ. 12 de Octubre, Madrid
Ana Ortiz Crespo Hosp. Univ. Vall d’Hebron, Barcelona
Mª Angélica Penín Hosp. de Terrassa, Barcelona
Montserrat Pérez Baena Hosp. Univ. San Dureta, Palma-Mallorca
Mª Paz Pérez García Hosp. Univ. de Gran Canaria Doctor Negrín, Las Palmas
Concepción Pérez López Hosp. Univ. Gregorio Marañón, Madrid
Mª Elena Pérez Menéndez Hosp. Reina Sofia, Tudela
Mª Angeles Pérez Sola C.C. Príncipe de Viana, Pamplona
Montserrat Pérez Etxebaribia Hosp. de Barcelona (SCIAS), Barcelona
Teresa Poca Prats Hosp. de Fuenlabrada, Madrid
Isabel Pujalos Herrero Hosp. Gral. de Cataluña, Barcelona
Eva Mª Puyó Soler Hosp. General de Valencia, Valencia
Arcadio Real Ramagueria Hosp. Clínico Univ. Virgen de la Victoria, Málaga
Concepción Rivas Marin Fundación Hospital Alcorcón, Madrid
Mónica Rivera Cabrera Hosp. Univ. 12 de Octubre, Madrid
Beatriz Rodríguez Guzón Hosp. Clínico Univ. San Cecilio, Granada
Mª José Rodríguez Tejero Hosp. Univ. 12 de Octubre, Madrid
Rafael Jesús Ruiz Carrera Hosp. Univ. Carlos Haya, Málaga
Mª Dolores Ruiz Fernández Hosp. de Valme, Sevilla
Mª Rosario Ruiz Marcos Hosp. Vega Baja, Orihuela, Alicante
Carmen Sabuz Freire Hosp. Cristal-Piñor, Orense
Irene Sánchez Cabarrusi Hosp. Univ. La Princesa, Madrid
Inmaculada Sánchez Crisol Hosp. Clínico Univ. San Cecilio, Granada
Mª Isabel Sánchez de la Blanca Martín Hosp. del Mar, Barcelona
Mª Angeles Sánchez Rey Lopez de la Vieja Hosp. Univ. Ramón y Cajal, Madrid
Mª Teresa Solé Baiges Hosp. Univ. Joan XXIII, Tarragona
Lilly Sotero Rentería Hosp. Juan Ramón Jiménez, Huelva
Mª José Tabara Antón Hosp. Provincial Rodríguez Chamorro, Zamora
zap ding Hosp. Univ. Bellvitge, Barcelona
Fco. José Valero Balboa Hosp. San Agustín de Linares, Jaén
Gloria Vaquer Casals Hosp. Univ. Dr. Josep Trueta, Girona
Mª Carmen Vázquez Garcia Hosp. General de Albacete, Albacete
Mª Carmen Vela García Hosp. Clínico Univ. San Cecilio, Granada

The cost-effectiveness of intensive follow-up should be explored using random sampling methods. Even though few significant differences in baseline patient characteristics were seen, potential sampling bias is an important limitation of this study. In addition to the known variables such as stoma type other (unknown), patient variables may have influenced the results of this study.

Telemonitoring and nurse-led telemonitoring programs

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for chronic diseases are commonly considered cost-effective. Studies to explore which stoma patients would most benefit from intensive follow-up are also needed.

Conclusion
The results of this study suggest that intensive telephone follow-up using the PatientFeedback® service in addition to the standard clinical follow-up may improve stoma patient quality of life in several, but not all, aspects of patient care and concerns.

This study underscores the preoperative as well as the postoperative role of the stoma care nurse in patient quality of life. The perception of dedicated care and follow-up may be difficult to measure; this study elucidates some of the areas in which clinicians can (and perhaps cannot) improve quality of life for persons with ostomies.

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References