

Patient Satisfaction with Enhanced Recovery after Colorectal Surgery: A Cross-Sectional Analytical Study

Mercedes Cabellos Olivares¹ , María Labalde Martínez² , Miguel Torralba¹ , José Ramón Rodríguez Fraile¹ , Beatriz Amorós Alfonso¹ , Juan Carlos Atance Martínez¹ 

¹Department of Anaesthesiology, Hospital Universitario de Guadalajara, Guadalajara, Spain

²Department of Surgery, Hospital I2 de Octubre, Madrid, Spain

ORCID IDs of the authors: M.C.O. 0000-0001-7788-2791; M.L.M. 0000-0001-9238-5945; M.T. 0000-0003-2166-7405; J.R.R.F. 0000-0003-1657-8299; B.A.A. 0000-0002-3993-6928, J.C.A.M. 0000-0003-1867-6512

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BACKGROUND/AIMS

Enhanced recovery after surgery protocols may reduce postoperative complications and the length of hospital stay. The aim of this study is to evaluate patient satisfaction after elective colorectal surgery with an enhanced recovery protocol (ERP).

MATERIAL and METHODS

Our first 119 consecutive patients who participated in an elective colorectal surgery with an ERP were interviewed via telephone 4 days after discharge. The questionnaire survey used was performed by the Workgroup of Guidelines of Enhanced Recovery for Abdominal Surgery and validated by the Ministry of Health, Social Services and Equality of Spain. We asked the patients about the quality of the preoperative information given by the surgeon and anesthetists, the treatment received by the medical staff, the degree of satisfaction during hospital stay, pain and other issues. We analyzed whether there was any relationship between these variables and their degree of satisfaction.

RESULTS

A total of 118 (99.2%) patients were very satisfied or satisfied and would be operated again according to the guidelines of this protocol. Ninety-four (79%) patients considered the information given by the surgeon and 99 (83.2%) the information given by the anesthetists to be very good. Ninety-four (77.69%) patients rated their pain during admission as ≤ 3 with the Visual Analogue Scale (VAS). The variables that were statistically associated with a higher degree of satisfaction were a low level of education, the high quality of the information received by health personnel prior to surgery, their subjective feeling that they were not going to get up from the sofa or start to walk, eat, or drink too soon after the surgery, and a good pain control reported by patients as ≤ 3 .

CONCLUSION

Most of patients after an ERP for elective colorectal surgery were very satisfied or satisfied with the assistance received during their hospital stay.

Keywords: Colorectal surgery, enhanced recovery after surgery, satisfaction, survey

INTRODUCTION

Enhanced recovery after surgery (ERAS) or fast-track surgery are collective standardized evidence-based preoperative, intraoperative, and postoperative multidisciplinary interventions that require close collaboration between surgeons, anesthesiologists, nurses, dietitians, pharmacists, home care specialists, and other caregivers. The evidence has validated the safety and effectiveness of the ERAS program in colorectal surgery, compared with the conventional management (1, 2). These bundled care initiatives are characterized by patient care rooted in dynamic evidence-based literature and re-evaluation of traditional practices with the goal of decreasing hospital length of stay (LOS) and improving patient outcomes. These programs were first implemented and described by Kehlet in 1997 and have been referred to as ERAS programs to emphasize the quality of patient recovery rather than the speed of discharge (3-9). Patients' relation with the health care team and their experience during their hospital stay are an important way to evaluate the effect of ERAS

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Corresponding Author: Mercedes Cabellos Olivares

E-mail: m.cabellos.olivares@gmail.com

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program in patients. However, the impact these protocols have on patient satisfaction and quality of life remains unclear (1, 2, 10). This protocol is based on the RICA (enhanced recovery for abdominal surgery) program published in 2014 by the Ministry of Health, Social Services, and Equality of Spain, in which a satisfaction survey was included to get to know the degree of satisfaction of our patients during their stay in the hospital; it is also based on the guidelines for perioperative care in elective colonic surgery (ERAS Society) (9, 11). The aim of this study was to evaluate the satisfaction of patients after the implementation of the ERAS program in elective colorectal surgery in the Guadalajara University Hospital, a university tertiary center.

MATERIAL and METHODS

This study was approved by the Ethics Committee of the University Hospital of Guadalajara, Spain, on April 25, 2017. All patients provided written informed consent. The department of Surgery and Anesthesiology at the hospital undertaking the study offered the ERAS program as standard care. The program provided a standardized pathway that guided the perioperative management of patients undergoing major abdominal elective colorectal surgery, excluding urgent and palliative surgeries. A series of 22 interventions were adopted (Table I) based on the RICA guide and the ERAS society recommendations (9, 11). A total of 121 consecutive patients were operated between the 1st of May 2016 and 31th of January 2017. We lost 2 patients be-

cause they died before hospital discharge, so we interviewed 119 patients. The inclusion criteria were elective colorectal surgery, over 18 years of age, appropriate cognitive state, and the ASA (American Society of Anesthesiologists) Grade I, II, or III. The exclusion criteria were the ASA Grade IV, urgent surgery, and existence of higher concomitant surgical processes. All patients included were invited to participate in this study by phone. Four days after discharge, a telephone anonymous survey was carried out. This survey was performed by the Workgroup of Guidelines of Enhanced Recovery for Abdominal Surgery and validated by the Spanish Society of Anesthesiology, the Spanish Association of Surgeons, and the Spanish Group of Multimodal Rehabilitation (GERM). It was published by the Ministry of Health, Social Services, and Equality of Spain. The survey instrument was designed to assess patient's experiences with ERAS program in relation to health-related quality of life, satisfaction of patients, and sociodemographic characteristics. The questionnaire is divided into several sections, and patients had to give their subjective assessment of 1) the quality of patient information given by surgeons and anesthesiologists before the surgery, to know if the patients had been well informed about their diagnosis, surgery, and type of anesthesia; 2) the treatment received by the patients from the staff of the hospital; 3) satisfaction related to the hospital room and operating room; 4) postoperative pain that was assessed using the patient-reported numerical rating scale 0 to 10, on which 0 represented no

TABLE I. ERAS protocol applied in the study: Compliance rates

	n	%
1. Intensive preoperative advice, written instructions, and an informational pamphlet	95	79.8
2. Drink clear liquid until 2 h prior to the time of procedure and solids until 6 h	119	100
3. Evaluation of nutritional status	95	79.8
4. Protocol of the optimization of preoperative anemia	95	79.8
5. Use of an incentive spirometer	95	79.8
6. Avoidance of full mechanical preparation for colon resection, with the exception of left-sided and rectal lesions	77	64.7
7. Administration of carbohydrate-rich drinks 2 h prior to surgery	96	80.7
8. DVT prophylaxis with subcutaneous heparin from the day prior to the surgery	119	100
9. Preoperative antibiotic prophylaxis	119	100
10. Compression stockings from the day prior to the surgery	112	94.1
11. Intraoperative pneumatic legs compression to deep vein thrombosis prophylaxis	63	53
12. Intraoperative warm-air body heating	114	95.8
13. Restrictive intraoperative fluid therapy	119	100
14. Avoidance of nasogastric tubes (patients without nasogastric tubes)	102	85.7
15. Avoidance of drains (patients without drains)	16	13.4
16. Minimizing opioids administration	90	75.6
17. Antiemetic prophylaxis	119	100
18. Taking oral fluids about POD0 and soft-food diet on POD2	45	37.8
19. Early mobilization (from bed to the sofa about POD0)	52	43.7
20. Urinary catheter removal on POD1	89	74.8
21. Multimodal analgesia (epidural catheter for open surgery cases)	49	41.2
22. Laparoscopic surgery	45	37.8

ERAS: Enhanced recovery after surgery; DVT: deep vein thrombosis; POD: postoperative day; POD 0: 6 hours after the surgery; POD 1: the 1st postoperative day; POD 2: the 2nd postoperative day

pain and 10 the worst possible pain; 5) the opinion of patients about the moment of the introduction of oral feeding and mobilization in the postoperative period by indication of the surgeon (too soon, rather soon, in time, late, very late); 6) nausea or vomiting after the surgery; 7) quality of information received from hospital staff after discharge from hospital; 8) degree of professionalism and competence of health personnel; 9) satisfaction during hospital admission (very satisfied, quite satisfied, satisfied, little satisfied, not satisfied); and 10) if they would return to have another procedure under this protocol and if they would recommend it to a friend (Appendix I) (II).

We divided the patients into two groups according to whether they were very satisfied or not very satisfied (from quite satisfied to not satisfied patients) with the assistance received during their hospital admission, and we analyzed the impact of different variables on the degree of satisfaction.

We also studied other variables to find the results of the implantation of the ERAS protocol in our hospital, such as the length of hospital stay (total hospital LOS was defined as the time from admission to discharge; all our patients were admitted to the hospital 1 day before surgery, so it includes the day before surgery and the day of surgery); readmission was defined as any cause of readmission to a system hospital within 30 days of surgery; short-term postoperative complications were graded using the Clavien–Dindo classification and the mortality of patients from any cause after 30 days after discharge (12, 13). The grade of pain was collected with self-reported pain score from 10 (worst) to 0 (no pain) with the Visual Analogue Scale (VAS).

The Statistical Package for Social Sciences (SPSS) version 20.0 (IBM Corp.; Armonk, NY, USA) software was used for statistical analysis. The results are presented as the number of patients (%), mean±standard deviation, or median and interquartile range. The Chi-square and Fisher exact tests were applied for the study of categorical variables, and Student t test was used for normally distributed quantitative variables. Logistic regression was used to assess what variables were associated with satisfaction using the odds ratio as a measure of risk. All tests were used with two tails, and the level of statistical significance was taken as $p < 0.05$.

RESULTS

Table I shows the results of the degree of compliance with the variables established in our protocol. The compliance with the ERAS protocol was 73.5%.

The clinical and demographic data of the 121 patients operated under the ERAS protocol are shown in Table 2.

The results of the survey are shown in Table 3 and Table 4. Thirty-one (26.1%) patients did not have education, 51 (42.9%) had primary education, 20 (16.8%) had middle education, and 17 (14.2%) had higher education. All of them, except one were, in Spanish. Ninety (75.6%) patients considered the equipment of the operating room and the hospital rooms suitable, 27 considered them (22.7%) quite adequate, and 2 (1.7%) adequate. Most of our patients answered that the information received by the surgeon or the anesthetist prior to the surgery was very good or good and were very happy or happy with the treatment re-

TABLE 2. Demographic and clinical data

Age	68.4±13.4
Male	77 (63.6%)
Body mass index	26.7±4.6
ASA grade	
I	12 (9.9%)
II	66 (54.5%)
III	43 (35.6%)
Diagnosis	
Colorectal cancer	109 (90.1%)
TNM stage	
0	2 (1.8%)
I	18 (16.6%)
2	28 (25.7%)
3	43 (39.4%)
4	18 (16.5%)
Reconstruction of transit	6 (5%)
Diverticular disease	2 (1.7%)
Inflammatory bowel disease	4 (3.3%)
Type of Surgery	
-Ileocecal resection	1 (0.8%)
-Subtotal colectomy	1 (0.8%)
-Total colectomy	0
-Reconstruction of transit	7 (5.8%)
-Right colectomy	36 (29.8%)
-Left colectomy	19 (15.7%)
-Resection of the colon	1 (0.8%)
-Sigmoidectomy	26 (21.5%)
-Low anterior resection	23 (19%)
-Hartmann	1 (0.8%)
-Abdominoperineal resection	6 (5%)
With Stoma	20 (16.5%)
Laparoscopic surgery	74 (61.2%)
Reconversion to open surgery	2 (1.6%)
Open surgery	45 (37.2%)
Postoperative hospital stay (includes the day before surgery and the day of surgery)	9.8±3.7
Without any Complication	83 (68.6%)
Complications (Clavien-Dindo classification)	
I	8 (6.6%)
2	17 (14.1%)
3	11 (9%)
4	0
5	2 (1.7%)
ICU	2 (1.7%)
Readmission rate 30 day all cause	12 (9.9%)
Mortality at 30 days	2 (1.7%)
Pain	2 (0-8)

ASA: American Society of Anesthesiologist; TNM: tumor, node, metastasis; ICU: intensive care unit

TABLE 3. Results of the survey based on subjective assessment of patients

	Very Good	Good	Regular	Bad	Very Bad
Information received before the surgery from					
- Surgeons	94 (79%)	18 (15.1%)	4 (3.4%)	3 (2.5%)	0
- Anesthetists	99 (83.2%)	19 (16%)	1 (0.8%)	0	0
Personal treatment received from					
- Surgeons	106 (89.1%)	11 (9.2%)	2 (1.7%)	0	0
- Anesthetists	107 (89.9%)	10 (8.4%)	2 (1.7%)	0	0
- Nurses	105 (85.2%)	8 (6.7%)	3 (2.5%)	2 (1.7%)	1 (0.8%)
Information and recommendations received at discharge from					
- Surgeons	69 (58%)	48 (40.3%)	2 (1.7%)	0	0
- Nurses	73 (61.3%)	44 (37%)	2 (1.7%)	0	0
The level of professional competence of the					
- Surgeons	105 (88.2%)	14 (11.8%)	0	0	0
- Anesthetists	107 (89.9%)	12 (10.1%)	0	0	0
- Nurses	102 (85.7%)	12 (10.1%)	2 (1.7%)	3 (2.5%)	0

TABLE 4. Results of the survey based on a subjective assessment of patients

	Too Soon	Rather Soon	In Time	Late	Very Late	p
Start eating or drinking after surgery	18 (15.1%)	37 (31.1%)	59 (49.6%)	4 (3.4%)	1 (0.8%)	0.693
Get up to the sofa after surgery	19 (16%)	35 (29.4%)	61 (51.3%)	4 (3.4%)	0	0.490
Walk after surgery	17 (14.3%)	38 (31.9%)	60 (50.4%)	4 (3.4%)	0	0.542

ceived from the medical staff (anesthetists, surgeons, and nurses) during their admission to the hospital. One hundred and twelve (94.1%) patients considered that the multidisciplinary team that participated in their surgery worked in a very coordinated way, 6 (5%) thought they were quite coordinated, and only 1 (8%) that they were coordinated. Thirty-nine (32.8%) patients had postoperative nausea or vomiting compared to 80 (67.2%) who did not have it. All of patients had received preoperative prophylaxis according to the Apfel criteria.

One hundred and twelve (92.6%) patients were very satisfied with the assistance received during their admission, 6 (5%) quite satisfied, and 1 (0.8%) dissatisfied. One hundred and eighteen (99.2%) patients would be operated again following the RICA protocol or would recommend it to a friend of a family member. Ninety-four (77.7%) patients rated pain during admission (patient self-reported pain score from 10 (worst) to 0 (no pain)) ≤ 3 , and 25 (20.7%) ≥ 4 .

The majority of our patients reported the information received by the health personnel before the surgery as very good, as well as the level of professional competence of the surgeons, anesthetists, and nurses. Half of our patients considered that the moment they started food intake tolerance and that they got up to the sofa and began to walk after the surgery was correct (in time).

One hundred and twelve patients were very satisfied with the assistance received during their hospital admission, 6 were satisfied, and 118 (99.2%) patients stated that they would be re-operated according to the guidelines of this protocol and would

recommend it to a friend; only 1 was not satisfied and would not recommend it.

Table 5 shows the statistical significance between the different variables analyzed and the degree of patient satisfaction. The variables that had a statistically significant influence on patient satisfaction were the level of studies, the high quality of the information given to the patients by the health care staff prior to surgery, their subjective feeling that they were not going to get up from the sofa and had to walk too soon after the surgery, their subjective feeling that they had not start eating or drinking too soon after the surgery, and a good pain control reported by patients as ≤ 3 in the postoperative period.

DISCUSSION

The results of this survey show that the majority of patients were very satisfied or satisfied with an ERP for an elective colorectal surgery. According to several articles, ERAS protocols improves patient satisfaction, which is very important for a successful implementation of an ERAS protocol (14, 15). An ERAS program is supposed to reduce morbidity, accelerate recovery, and shorten the hospital stay of surgical patients, and as we can see, in our study does not occur at the expense of patient satisfaction (16-18).

The degree of coordination of the medical team that participated in the surgery, perceived by the patient, was not related in a statistically significant way with the satisfaction of the patients. Most patients considered that the multidisciplinary team that worked on their surgical procedure was very coordinated and would be re-operated according to the guidelines of this proto-

TABLE 5. Comparison between variables and the degree of satisfaction

	Very Satisfied	Not Very Satisfied	p	OR	IC 95% OR
Studies					
- Without studies or primary studies	80/82 (97.6%)	2/82 (2.4%)	0.029	0.16	0.03-0.97
- Medium or high studies	32/37 (86.5%)	5/37 (13.5%)			
Clavien-Dindo complications			0.1	-----	-----
- No	76/83 (91.6%)	7/83 (8.4%)			
- Yes	36/36 (100%)	0/36 (0%)			
Clavien-Dindo complications			I	-----	-----
0-2	101/108 (93.5%)	7/108 (6.5%)			
3-5	11/11 (100%)	0/11 (0%)			
Postoperative nausea and vomiting			0.424	3.08	0.36-26.5
- No	74/80 (92.5%)	6/80 (7.5%)			
- Yes	38/39 (97.4%)	1/39 (2.6%)			
Information received by health personnel prior to surgery			0.004	11.5	2.1-63.6
- Very good	92/94 (97.9%)	2/94 (2.1%)			
- Good-regular-bad-very bad	20/25 (80%)	5/25 (20%)			
Room			I	-----	-----
- Single room	3/3 (100%)	0/3 (0%)			
- Double room	109/116 (97.3%)	7/116 (100%)			
Start eating or drinking after surgery			0.011	0.11	0.02-0.54
- Too soon	14/18 (77.8%)	4/18 (22.2%)			
- Rather soon-in time-late-very late	96/99 (97%)	3/99 (3%)			
Get up to the sofa after surgery			0.012	0.12	0.02-0.57
- Too soon	15/19 (78.9%)	4/19 (21.1%)			
- Rather soon-in time-late-very late	97/100 (97%)	3/100 (3%)			
Walk after surgery			0.008	0.01	0.02-0.49
- Too soon	13/17 (76.7%)	4/17 (23.5%)			
- Rather soon-in time-late-very late	99/102 (97.1%)	3/102 (2.9%)			
Surgical and medical team coordination			0.35	2.9	0.30-28.53
-Very coordinated	106/112 (94.6%)	6/112 (5.4%)			
- Quite coordinated-coordinated	6/7(85.7%)	1/7 (14.3%)			
Diagnosis			I	-----	-----
- Colorectal cancer	100/107 (93.5%)	7/107 (6.5%)			
- Others	12/12 (100%)	0/12 (0%)			
Operative approach			I	1.5	0.28-8.1
- Laparoscopic	42/44 (95.5%)	2/44 (24.5%)			
- Open	70/75 (93.3%)	5/75 (6.7%)			
Pain			0.035	0.17	0.4-0.83
≤3	91/94 (96.8%)	3/94 (3.2%)			
≥4	21/25 (84%)	4/25 (16%)			

col and would recommend it to a friend. The implementation of an ERAS program requires a dedicated and motivated team of which the surgeon, anesthesiologist, and nursing team are the mainspring. A good teamwork will achieve maximum compliance in the items established by the ERAS protocol, which will improve the results. Both the patient and the medical team are committed to work together striving for an enhanced recovery (18).

One of the most important items included into ERAS protocols is the improvement in the oral and written information given to patients by the health care personnel prior to surgery. All our patients received oral and written information, and our results show that the majority of patients considered that information as good or very good. Preoperative counseling may decrease patient fear and anxiety before surgery (9). We found statistical-

ly significant differences in the quality of the preoperative information received by the patient and the degree of satisfaction. Patients and their families should be correctly informed about the items established by the ERAS protocol during the perioperative period with regard to early feeding and mobilization, the importance of respiratory physiotherapy, and an adequate pain control.

These new guidelines could reduce the prevalence of complications and motivate multidisciplinary teams and patients to implement these protocols (19, 20).

Most of patients had a degree of pain ≤ 3 , and they were very satisfied with the assistance received. Optimizing perioperative pain management while reducing the use of opioids were major goals of the ERAS program (9, 21-23). Our pain management strategy incorporated analgesic protocols with the use of epidural analgesia, the use of opioids in the postoperative period, and regional blockages. We indicated the use of thoracic epidural catheters for open surgery and surgical wound infiltration whenever it was a laparoscopic surgery.

Other variables that negatively influenced the degree of patients' satisfaction were the patient's subjective sensation of having to get up from the sofa or walking and eating and drinking too early in the postoperative period by the surgeon's indication. Early postoperative mobilization and feeding are two very important items of the ERAS protocols that patients must do in the postoperative period when indicated by the surgeon and which reflect a better evolution of the patients. Early mobilization has been postulated to reduce chest complications and may counteract insulin resistance from immobilization (9). However, when this happens, according to the subjective perception of the patients, their degree of satisfaction is lower. So, it is important to involve patients in the development of ERAS protocols. They have to know the steps to follow each day, to collaborate as much as possible with the medical team, and they should understand which are the different items of the ERAS programs that make a very important change from conventional surgery. It is very important that the patient knows and trusts the medical team who will participate in the surgery. So, as we said before, providing detailed information to patients prior to surgery is essential.

Other authors identified factors such as education, coordination, and communication between a multidisciplinary team as vital for the success of the protocol (24, 25). We found statistically significant differences between the levels of education of our patients. Patients without education or with primary education were more satisfied than patients with medium or high education.

No statistically significant differences were found between the degree of satisfaction of patients undergoing open surgery or laparoscopy. Several articles show that when laparoscopy and ERAS are combined, major morbidity rates and the length of hospital stay are reduced (18). The articles that analyzed differences in the postoperative quality of life between the open and laparoscopic ERAS patients concluded that no differences existed between groups (26-29). However, we have not found articles that relate laparoscopy or open surgery to the degree of patient satisfaction.

Our study has some limitations. Only one non-randomized study compared patient satisfaction after ERAS and conventional surgery, and the conclusions were that patients appear to be equally satisfied with ERAS and conventional surgery (18). From May 2016 to present, all patients were treated using the ERAS protocol, so we cannot compare these results with a control group or a conventional surgery no-ERAS group. In the present study, faster recuperation after colonic surgery may bring the patients a better subjective feeling and satisfaction. The main limitation of this study was that it was not randomized, and there was no control group. Besides, the patients self-reported components were subjective data. We used a questionnaire survey validated by several medical societies. However, it is very difficult to compare the results of our study with other studies, because the few studies examining satisfaction that exist use other surveys and measure other variables since there is no scale or standardized index to assess the degree of satisfaction of our patients after an elective colorectal surgery.

In conclusion, most of patients after an ERP for an elective colorectal surgery are very satisfied with the assistance received during their hospital stay.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of the University Hospital of Guadalajara (Approval Date: 25.04.2017, Approval Number: PI8/17).

Informed Consent: Written informed consent was obtained from all patients.

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REFERENCES

1. Wang H, Zhu D, Liang L, Ye L, Lin Q, Zhong Y, et al. Short-term quality of life in patients undergoing colonic surgery using enhanced recovery after surgery program versus conventional perioperative management. *Qual Life Res* 2015; 24: 2663-70. [CrossRef]
2. Mohn AC, Bernardshaw SV, Ristesund SM, Hovde Hansen PE, Røkke O. Enhanced recovery after colorectal surgery. Results from a prospective observational two-centre study. *Scand J Surg* 2009; 98: 155-9. [CrossRef]
3. Martin TD, Lorenz T, Ferraro J, Chagin K, Lampman RM, Emery KL, et al. Newly implemented enhanced recovery pathway positively impacts hospital length of stay. *Surg Endosc* 2016; 30: 4019-28. [CrossRef]

4. Kehlet H. Multimodal approach to control postoperative pathophysiology and rehabilitation. *Br J Anaesth* 1997; 78: 606-17. [\[CrossRef\]](#)
5. Langenhoff BS, Krabbe PF, Wobbes T, Ruers TJ. Quality of life as an outcome measure in surgical oncology. *Br J Surg* 2001; 88: 643-52. [\[CrossRef\]](#)
6. Neville A, Lee L, Antonescu I, Mayo NE, Vassiliou MC, Fried GM, et al. Systematic review of outcomes used to evaluate enhanced recovery after surgery. *Br J Surg* 2014; 101: 159-70. [\[CrossRef\]](#)
7. Zhuang CL, Ye XZ, Zhang XD, Chen BC, Yu Z. Enhanced recovery after surgery programs versus traditional care for colorectal surgery: A meta-analysis of randomized controlled trials. *Dis Colon Rectum* 2013; 56: 667-78. [\[CrossRef\]](#)
8. ASGBI-Issues in professional practice (ERAS guidelines). Guidelines for implementation of enhanced recovery protocols. December. ASGBI- Issues in professional practice. (Internet) 2009. Cited June 2018. Available from: http://www.asgbi.org.uk/en/publications/issues_in_professional_practice.cfm
9. Gustafson UO, Scott MJ, Schwenk W, Demartines N, Roulin D, Francis N, et al. Guidelines for perioperative care in elective colonic surgery: enhanced recovery after surgery (ERAS) Society. Recommendations. *World J Surg* 2013; 37: 259-84. [\[CrossRef\]](#)
10. Khan S, Wilson T, Ahmed J, Owais A, MacFie J. Quality of life and patient satisfaction with enhanced recovery protocols. *Colorectal Dis* 2012; 12: 1175-82. [\[CrossRef\]](#)
11. Calvo JM, del Valle E, Ramirez JM, Loinaz C, Martín Trapero C, Nogueiras C et al. Vía clínica RICA. Vía Clínica de Recuperación Intensificada en Cirugía Abdominal (RICA). Ministerio de Sanidad, Servicios Sociales e Igualdad; Instituto Aragonés de Ciencias de la Salud (Internet) 2015. Cited June 2018. Available from: <http://Portal.guiasalud.es/contenidos/iframes/documentos/opbe/2015.../Via-ClinicaRICA.pdf>
12. Dindo D, Demartines N, Clavien PA. Classification of surgical complications: a new proposal with evaluation in a cohort of 6336 patients and results of a survey. *Ann Surg* 2004; 240: 205-13. [\[CrossRef\]](#)
13. Clavien PA, Barkum J, de Oliveira ML, Vauthney JN, Dindo D, Schulick RD, et al. The Clavien-Dindo classification of surgical complications: five-year experience. *Ann Surg* 2009; 250: 187-96. [\[CrossRef\]](#)
14. Thiele RH, Rea KM, Turrentine FE, Friel CM, Hassinger TE, McMurry TL, et al. Standardization of care: impact of an enhanced recovery protocol on length of stay, complications, and direct costs after colorectal surgery. *J Am Coll Surg* 2015; 220: 430-44. [\[CrossRef\]](#)
15. Patoune A, Coimbra C, Brichant JF, Joris J. Quality of life at home at satisfaction of patient after enhanced recovery protocol of colorectal surgery. *Acta Chir Belg* 2017; 117: 176-80. [\[CrossRef\]](#)
16. ERAS Compliance Group. The impact of Enhanced Recovery Protocol Compliance on elective colorectal cancer resection. Results from an international Registry. *Ann Surg* 2015; 261: 1153-9. [\[CrossRef\]](#)
17. Kisialeuski M, Pedziwiatr M, Mattok M, Major P, Migaczewski M, Kolodziej D, et al. Enhanced recovery after colorectal surgery in elderly patients. *Wideochir Inne Tech Maloinwazyjne* 2015; 10: 30-6. [\[CrossRef\]](#)
18. Polle SW, Wind J, Fuhring JW, Hofland J, Gouma DJ, Bemelman WA. Implementation of a Fast-Track Perioperative Care Program: What Are the Difficulties? *Dig Surg* 2007; 24: 441-9. [\[CrossRef\]](#)
19. Djurasić L, Pavlovic A, Zaric N, Palibrk I, Basarić D, Djordjević VR. The effects of early rehabilitation in patients with surgically treated colorectal cancer. *Acta Chir Iugosl* 2012; 59: 89-91. [\[CrossRef\]](#)
20. Feldman LS, Lee L, Fiore J Jr. What outcomes are important in the assessment of Enhanced Recovery After Surgery (ERAS) pathways? *Can J Anaesth* 2015; 62: 120-30. [\[CrossRef\]](#)
21. Ventham NT, Hughes M, O'Neill S, Johns N, Brady RR, Wigmore SJ. Systematic review and meta-analysis of continuous local anaesthetic wound infiltration versus epidural analgesia for postoperative pain following abdominal surgery. *Br J Surg* 2013; 100: 1280-9. [\[CrossRef\]](#)
22. Levy BF, Tilney HS, Dowson HM, Rockall TA. A systematic review of postoperative analgesia following laparoscopic colorectal surgery. *Colorectal Dis* 2010; 12: 5-15. [\[CrossRef\]](#)
23. Turunen P, Carpelan-Holmström M, Kairaluoma P, Wikström H, Kruuna O, Pere P, et al. Epidural analgesia diminished pain but did not otherwise improve enhanced recovery after laparoscopic sigmoidectomy: a prospective randomized study. *Surg Endosc* 2009; 23: 31-7. [\[CrossRef\]](#)
24. Hughes M, Coolsen MM, Aahlin EK, Harrison EM, McNally SJ, Dejong CH, et al. Attitudes of patients and care providers to enhanced recovery after surgery programs after major abdominal surgery. *J Surg Res* 2015; 193: 102-10. [\[CrossRef\]](#)
25. Lyon A, Solomon MJ, Harrison JD. A qualitative study assessing the barriers to implementation of enhanced recovery after surgery. *Word J Surg* 2014; 38: 1374-80. [\[CrossRef\]](#)
26. Spanjersber WR, Van Sambeek JD, Bremers A, Rosman C, van Laarhoven CJ. Systematic review and meta-analysis for laparoscopic versus open colon surgery with or without an ERAS program. *Surg Endosc* 2015; 29: 3443-53. [\[CrossRef\]](#)
27. King PM, Blazeby JM, Ewings P, Franks PJ, Longman RJ, Kendrick AH, et al. Randomized clinical trial comparing laparoscopic and open surgery for colorectal cancer within an enhanced recovery programme. *Br J Surg* 2006; 93: 300-8. [\[CrossRef\]](#)
28. King PM, Blazeby JM, Ewings P, Kennedy RH. Detailed evaluation of functional recovery following laparoscopic or open surgery for colorectal cancer within an enhanced recovery programme. *Int J Colorectal Dis* 2008; 23: 795-800. [\[CrossRef\]](#)
29. MacKay G, Ihedioha U, McConnachie A, Serpell M, Molloy RG, O'Dwyer PJ. Laparoscopic colonic resection in fast-track patients does not enhance short-term recovery after elective surgery. *Colorectal Dis* 2007; 9: 368-72. [\[CrossRef\]](#)

Appendix I: SATISFACTION SURVEY (RICA program)**GENERAL DATA**Age: Male Female Level of education: without education primary education secondary education higher education **MEDICAL DATA**

The surgery was performed by

general surgeon urologist gynecologist several others **PREOPERATIVE INFORMATION**

You would qualify the information received before the surgery from the surgeon as

very good good regular bad very bad

You would qualify the information received before the surgery from the anesthetist as

very good good regular bad very bad

You would qualify the information received before the surgery from the nurse as

very good good regular bad very bad **TREATMENT RECEIVED BY THE HOSPITAL STAFF**

You would qualify the personal treatment you received from the surgeon who attended you as

very good good regular bad very bad

You would qualify the personal treatment you received from the anesthetists who attended you as

very good good regular bad very bad

You would qualify the personal treatment you received from the nurses who attended you as

very good good regular bad very bad

You would qualify the personal treatment you received from other personal health care providers who attended you as

very good good regular bad very bad **HOSPITAL FACILITIES AND EQUIPMENT**

In your opinion, the operating room where you were operated and the equipment were

very suitable quite adequate suitable bit right nothing right

The room in which you stayed after the post-anesthesia care unit until the discharge from the hospital was

single double

The room in which you stayed after the post-anesthesia care unit until the discharge from the hospital was

very suitable quite adequate suitable bit right nothing right **PAIN**

What was the level of pain you experienced after surgery? 0 = absence of pain; 10 = horrible pain

0 1 2 3 4 5 6 7 8 9 10

POSTOPERATIVE ORAL FEEDINGAfter the surgery, you had nausea or vomiting: yes no

When you had to drink or eat, you found that it was

too soon rather soon in time late very late

POSTOPERATIVE MOBILIZATION

When you had to get up to the sofa, you found that it was

too soon rather soon in time late very late

When you had to walk, you found it was

too soon rather soon in time late very late

DISCHARGE FROM HOSPITAL

You would qualify the information and recommendations received at discharge from the surgeon as

very good good regular bad very bad

You would qualify the information and recommendations received at discharge from the nurse as

very good good regular bad very bad

COMPETENCE AND PROFESSIONALISM

In your opinion, the level of professional competence of the surgeons was

very high high normal low very low

In your opinion, the level of professional competence of the anesthesiologists was

very high high normal low very low

In your opinion, the level of professional competence of the nurses was

very high high normal low very low

In your opinion, the level of professional competence by other personal health care providers was

very high high normal low very low

The multidisciplinary team approach was

very coordinated quite coordinated coordinated little coordinated nothing coordinated

If you had to undergo surgery again, would you like to be operated based on the RICA program?

yes no

Would you recommend the RICA program to a family member that has to be operated?

yes no

SATISFACTION

Your satisfaction with the assistance provided was

very satisfied quite satisfied satisfied little satisfied not satisfied

OBSERVATIONS

The most positive thing for you was:

The most negative thing for you was:

Would you include any improvements?