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RESEARCH ARTICLE

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The effect of discharge training developed based on nursing interventions classification (NIC) on surgical recovery in oncology patients: Randomized controlled trial - A pilot study[1]

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Abstract

Aim: To investigate the effect of discharge training on surgical recovery in oncology patients.

Design: A two-arm parallel-group randomized controlled trial (RCT) registered at clinicaltrials.gov (NCT04862104) and reporting according to the CONSORT checklist.

Methods: The study was conducted with 78 patients who had undergone cancer surgery in a university hospital. The intervention group took discharge training; the control group received routine care. The surgical recovery was measured before discharge and 2, 4 and 8 weeks after the discharge.

Results: There was a higher surgical recovery score in the intervention group compared with the usual care group at the second, fourth and eighth week after discharge. This study is expected to support discharge training as enhancing recovery in oncology surgical patients.

Conclusion: This pilot study shows that discharge training developed based on the Nursing Intervention Classification can be used in clinics to enhance the surgical recovery of patients.

KEYWORDS
discharge training, follow-up, nursing, surgical recovery

1 | INTRODUCTION

The concept of surgical recovery is defined as 'resumption of activities to maintain daily life, health and wellbeing after surgery', whereas delayed surgical recovery is defined as 'increasing number of postoperative days for the resumption of activities to maintain daily life, health and wellbeing after surgery' (Butcher et al., 2018; Santana et al., 2018). Symptoms like fatigue, pain, incisional site infection and loss of appetite commonly experienced postoperatively are associated with delay in surgical recovery (Couceiro et al., 2009; Santana, Amaral, et al., 2014; Santana & de Oliveira Lopes, 2015). In addition to these symptoms, delays in returning to home/work activities, nausea, loss of appetite, pain and difficulty in moving, to mention a few, indicate that surgical recovery has been interrupted (Santana, Delphino, et al., 2014). Studies have reported that delays in surgical recovery after operations like gastrostomy, colectomy and exploratory laparotomy are common (Butcher et al., 2018; Santana et al., 2018).

[1]This study was an oral presentation at the 4th INTERNATIONAL HEALTH SCIENCES AND LIFE CONGRESS (IHSLC 2021).

The care needs of patients who undergo surgery continue after discharge, resulting having an incision site and possibly permanent lifestyle changes (Yildirim & Bayraktar, 2010). Patients who have undergone gastric or colorectal cancer surgery need to receive discharge training before their return to social and work life. Nurses should identify the problems patients may encounter at home after gastrectomy, colectomy and exploratory laparotomy in which delayed surgical recovery is frequently reported. Nurses should plan and implement discharge training about these problems and follow-up patients' surgical recovery at home (Şahin et al., 2015; Yildirim & Bayraktar, 2010).

The Nursing Interventions Classification (NIC) was developed to define nursing interventions in all nursing fields and care environments. The definitions, interventions and nursing activities provided in this classification can be used during discharge training after surgery and for patient follow-up at home. It is recommended that discharge training be provided for patients using the activities in the classification system for the safe continuance of surgical recovery at home and prevention of delays in surgical recovery. Patients should be followed up via phone calls and that the process should be kept under control. Accordingly, the surgical recovery process can be supported, and delays in surgical recovery can be prevented (Santana, Amaral, et al., 2014).

2 | BACKGROUND

Previous studies have reported that discharge training given postoperatively and monitoring patients at home facilitates patients' adaptation to their new lives, accelerates their recovery rate and prevents almost half of unplanned rehospitalization (Kang et al., 2018; Santana et al., 2018; Zheng et al., 2013). Schweitzer et al. (2014) reported that systematic and family-centred discharge training improved patient outcomes in paediatric patients with gastrostomy tubes. Veronovici et al. (2014) stated that discharge training given to patients who had undergone cardiovascular surgery decreased patients' anxiety and depression. Akbari and Celik (2015) reported that discharge training given to patients who had undergone coronary artery bypass graft surgery increased patients' compliance with the treatment; patients who received this education encountered fewer problems than those who did not receive it. Thus, more studies should be conducted with cohorts of general surgery patients to identify issues resulting from insufficient identification of problems related to surgical recovery among these patients; the low level of evidence in studies on discharge training and their insufficient existence in the literature (Kang et al., 2018).

Güçlü and Kurşun (2017) reported that the need for discharge education is high in general surgery patients, and that the patients' knowledge about the problems that can be seen after discharge will ensure the continuity of the recovery process. It is recommended to plan an education that includes information about self-care after discharge and to prevent postoperative complications, to be given both orally and in writing, and to follow-up the patients at home after the education (Norlyk & Harder, 2011; Kang et al., 2018). It is reported that the education to be given to the patients in the postoperative period should include wound care, pain control, nutrition, self-care recommendations and common complications (Dursun & Yılmaz, 2015). Studies have reported that patients who receive discharge training recover faster, and that unplanned and repeated hospitalizations are reduced (Dursun & Yılmaz, 2015). We hypothesize that upon completion of the discharge training intervention, the participants who had undergone surgery with the diagnosis of gastrectomy or colectomy in trial group will report high surgical recovery scores.

3 | METHODS

3.1 | Study design

This study was a randomized clinical trial with an 8-week follow-up design, including two arms (intervention and control) based on the Consolidated Standards of Reporting Trials (CONSORT) checklist (Figure 1), which was used as the reporting guideline (Appendix S1, CONSORT checklist). The study included patients who undergone gastrectomy, colectomy or rectectomy between August 1, 2018 and July 31, 2019. This randomized clinical trial (RCT) was registered on April 23, 2021, at https://www.clinicaltrials.gov/, ID: NCT04862104).

The inclusion criteria were undergoing cancer surgery for the first time; having a cellphone through which the patient or a relative can be reached; and accepting to participate in the study. The exclusion criteria were receiving chemotherapy, radiotherapy or the combination of these therapies in the last 2 months evidenced by the patient's medical history; answering only one of three repeated calls or not answering; developing a complication during monitoring; and having a seeing or hearing problem.

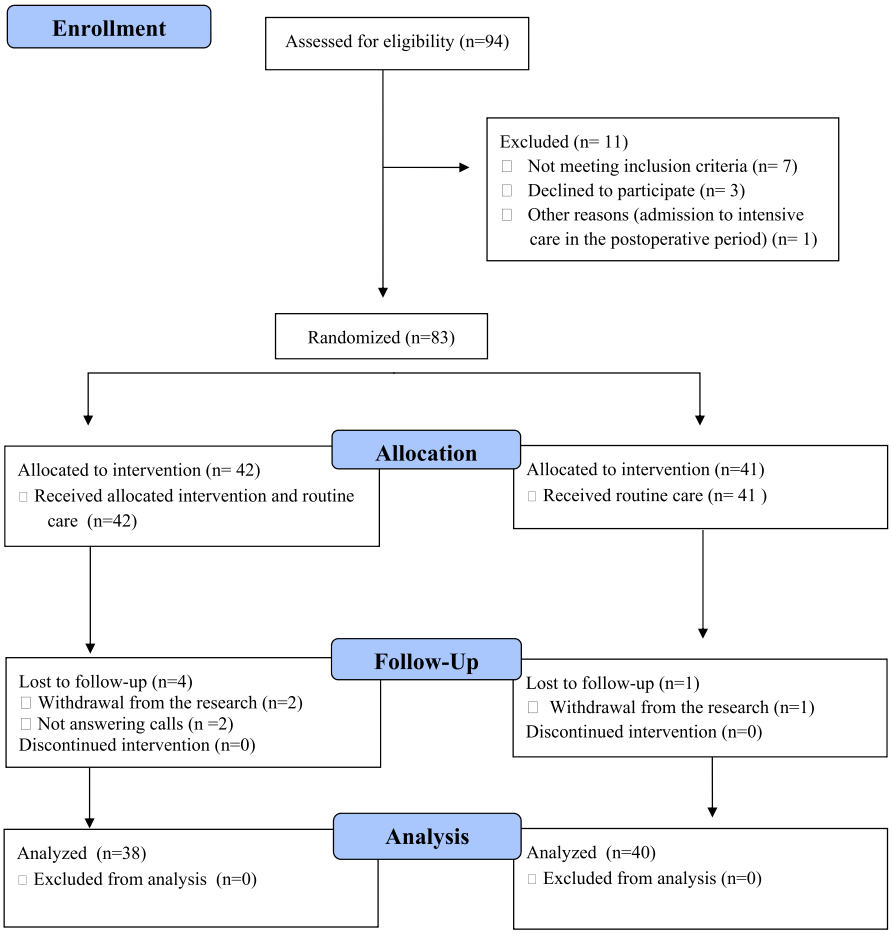
3.2 | Ethical considerations

This study was approved by the Aydin Adnan Menderes University Faculty of Nursing Non-invasive Ethics Committee (50107718-050.04.04-2018/029). Institutional permission (63364346-804.01) was obtained from the hospital where the study was conducted. In addition, written informed consent was obtained from all patients in the study.

3.3 | Participants

Participants were recruited via diagnostic registers from a university hospital in western Turkey. The inclusion criteria were undergoing cancer surgery for the first time; having a cellphone through which the patient or a relative can be reached; and accepting participation in the study. The exclusion criteria were receiving chemotherapy, radiotherapy or the combination of these therapies in the last 2 months in the patient's medical history; answering only one of three repeated calls or not answering; developing a complication during monitoring; and having a seeing or hearing problem.

FIGURE 1 The CONSORT Flow Diagram



3.4 | Sample size, randomization and allocations

The population of the study included 167 patients who had undergone surgery with the diagnosis of gastrectomy or colectomy between August 1, 2018 and July 31, 2019 in the General Surgery clinic. The sample size was calculated based on the 0.32 effect size determined from the reference study (Santana et al., 2018) using the G*Power 3.1.9.2 program. This research required a minimum of 75 patients total (the intervention group was calculated as 38 and the control group as 37) to maintain significance level was 5% (α), statistical power was 80% (1-β), group number was 2, and repetition number was 4. Considering that there might be losses during monitoring, 10% more patients were planned to be included in both groups, and that 83 patients would participate in the study as a result of the sampling calculation. The study was conducted with 78 patients who had undergone gastrectomy, colectomy or rectectomy for oncological reasons.

Randomization in the study was done by the researcher in a computer environment. The patients were numbered from 1 to 78 according to the order of their surgery, and the numbers were assigned to the intervention and control groups using www.randomizer.org. To confirm the homogeneity of the groups after randomization, the intervention and control groups were compared for age using the chi-square test. It was determined that there was no statistically significant difference between the groups (Table 1).

3.5 | Measures

3.5.1 | Patient identification form

The patient identification form included 28 questions developed by the researcher about sociodemographic information and general clinical status (Hartford et al., 2002; Lives, 2009; Santana et al., 2018; Santana & de Oliveira Lopes, 2015; Zheng et al., 2013). The questions included age, sex, marital status, education level, income level, having someone to provide care, medical diagnosis, weight, height, BMI, having long-term diseases, having unhealthy habits, the patient's initial complaints, type of the surgery undergone, type of anaesthesia, duration of hospital stay, incision properties and presence of a stoma.

3.5.2 | Patient evaluation form

The patient evaluation form included questions about the presence of nine descriptive characteristics as follows: delay in returning to activities at home/work, perception that more time is needed to recover, requiring help to complete self-care, existing evidence that surgical site had deteriorated. The existence of one problem at discharge such as swelling, redness, pain and bleeding on the site was considered a mild level; the existence of all these problems, a severe level. Loss of appetite with nausea, loss of appetite without nausea,

TABLE 1 Demographic and clinical variables ($n = 78$)

Variables	Intervention ($n = 38$)		Control ($n = 40$)		p-Value[a]
	N	%	*n*	%	
Gender					
Male	18	47.4%	18	45%	0.646
Female	20	52.6%	22	55%	
Age[b]	63.0 ± 10.3 (41–83)		65.50 ± 12.5 (41–86)		0.337
Body Mass Index[b]	25.6 ± 2.8 (20.7–38.3)		25.3 ± 2.6 (21.1–31.9)		0.500
Surgery/Diagnosis					
Gastrectomy	8	21.1%	9	22.5%	0.030
Colectomy	22	57.9%	23	57.5%	
Rectectomy	8	21.1%	8	20%	
Disease stage					
Stage 2	–	–	2	5%	0.285
Stage 3	35	92.1%	33	82.5%	
Stage 4	3	7.9%	5	12.5%	
Primary caregivers					
No	–	–	–	–	NA
Yes	38	100%	40	100%	
Initial complaints[c]					
No	1	2.6%	–	–	0.487
Yes*	37	97.4%	40	100%	
Nausea	13	34.2%	12	30%	0.690
Vomit	4	10.5%	7	17.5%	0.376
Change in defecation	18	47.4%	23	57.5%	0.370
Constipation	3	7.9%	5	12.5%	0.712
Diarrhoea	3	7.9%	4	10%	1.000
Weight loss	16	42.1%	29	72.5%	**0.007***
Loss of appetite	3	7.9%	5	12.5%	0.712
Rectal bleeding	14	36.8%	12	30%	0.522
Bloating	6	15.8%	13	32.5%	0.086
Pain	11	28.9%	10	25%	0.694
Weight Loss in the Last 6 Months					
No	14	36.8%	8	20%	0.098
Yes	24	63.2%	32	80%	
Medical treatment history					
No	34	89.5%	29	72.5%	0.057
Yes	4	10.5%	11	27.5%	
Chemotherapy (CT)	4	10.5%	4	10%	0.939
Radiotherapy (RT)	–	–	–	–	0.111
Combine Therapy (CT and RT)	–	–	7	17.5%	0.312
Weight Loss in the Past 6 Months[b]	9.81 ± 4.5 (3–22)		10.21 ± 4.8 (2–20)		0.755

Abbreviation: NA, not applicable.

[a]X^2 or Fisher's exact test.

[b]Average ± standard deviation (minimum-maximum) compared through Student's *t*-test for independent samples.

[c]Based on self report.

* and Bold values indicate significant differences at $p < 0.05$.

difficulty moving around, state of pain or discomfort, and fatigue were termed 'delayed surgical recovery' as defined by the North American Nursing Diagnosis Association International (NANDA-I).

The patient evaluation form was a five-point Likert-type scale measuring the severity of descriptive characteristics as follows: 1, severely distressed; 2, statistically significantly distressed; 3, moderately distressed; 4, mildly distressed; and 5, no distress. The patients were asked to express the nine descriptive characteristics, if experienced, in those terms.

3.6 | Blinding

This pilot study was conducted unblinded. All parties were involved in a study are aware of the treatment the participants are receiving. Because of the nature of the intervention, it was not possible to blind the participants to their study group assignment. The care provided to both groups except for the intervention group was standardized, and the measures were planned as repeated to reduce bias.

3.7 | The intervention

The discharge training was developed by extensive review of the existing literature. Two separate booklets were prepared for patients who had undergone gastrectomy and colectomy. The content and form of both booklets were evaluated by two expert physicians and four nurse academics using the Writing Material Eligibility Form and the DISCERN Measurement Tool.

The Writing Material Eligibility Form developed by Doak et al. (1996) has six sub-sections (content evaluation, evaluation of literacy state, evaluation of pictures, graphics, tables, lists, evaluation of the plan and type), a three-question learning and motivation evaluation and the evaluation of cultural appropriateness; it includes 27 questions in all. If the statement in each section was suitable for the written teaching material, one point is granted for each yes and zero points for each no answer. The written teaching material can be scored between 0 and 27 as a result of the evaluation. Higher scores indicate that the written material has a high level of readability. The DISCERN Measurement Tool (Quality Criteria for Consumer Health Information), developed by Charnock et al. (1999) and adopted to Turkish by Gökdoğan et al., was used for the 15 items in DISCERN. The participant's written teaching material can be scored between 15 and 75 as a result of the evaluation. Higher scores indicate that the written teaching material prepared is reliable and that the quality of the information is high.

The mean score of the educational booklet developed for patients who had undergone gastrectomy was 20.6 with the Writing Material Eligibility Form and 65 with the DISCERN Measurement Tool, whereas the mean score of the educational booklet developed for patients who had undergone colectomy was 20.3 with the Writing Material Eligibility Form and 64.6 with the DISCERN Measurement Tool. The booklets were finalized in response to the expert opinions and were presented to experts for re-evaluation. The mean scores obtained at the last evaluation were 22.6 and 70 for the booklet developed for patients who had undergone gastrectomy, whereas the mean scores of the educational booklet developed for patients who had undergone colectomy were 22.1 and 69.8.

Patients who met the inclusion criteria were interviewed in the preoperative period. During the interview, information was provided about the study, and both verbal and written consent was obtained. The data collection form was introduced to the patients who agreed to participate. Patients in the intervention and control groups were evaluated before discharge in the postoperative period. Discharge training consisted of a verbal and a written information booklet containing instructions for the patient and the patient's caregivers on pain management, nutrition management, incision site care, strengthening self-care, returning to daily life activities and colostomy care.

Intervention group patients received the same routine care as that for control group patients. In addition, the discharge training was provided in the service after evaluating the surgical recovery status of the patient before discharge. The average duration of each training was 30–45 minutes. The patients were evaluated in terms of surgical recovery by phone calls at 2 weeks, 4 weeks and 8 weeks after discharge. The completed educational booklet was provided to the patient or patient caregiver; it ensured that the patient could benefit from the information at home.

The patients in both groups were evaluated in terms of their surgical recovery status at four different times (Figure 2).

3.8 | Outcome assessment

The surgical recovery score average in patients was primary outcome of this study. The outcome was assessed using the Patient Evaluation Form, nine defining the diagnosis of 'delayed surgical recovery' by questions as in NANDA-I (delaying starting activities at home/work, understanding that more time is required for recovery, need for assistance in self-care practices, evidence indicating impaired surgical site presence, loss of appetite with nausea, loss of appetite without nausea, difficulty in moving around, pain or discomfort, fatigue). The patient evaluation form was created using the Nursing Outcomes Classification (NOC) five-point Likert-type scale measuring the severity of descriptive features. The expression 'severely distressed' received 1 point; 'significantly distressed' was evaluated as 2 points; 'moderately distressed' as 3 points, 'mildly distressed' as 4 points and 'no distress' as 5 points. Patients were asked to express the severity of the nine descriptive characteristics as 'severely/ significantly/ moderately/ mildly/ no distress'. In each evaluation stage the patient can achieve a minimum of nine and maximum of 45 points. As the score for each evaluation question increased, the improvement was evaluated as positive.

3.9 | Control

Control group patients received routine care that included oral information about wound care, signs of infection at the wound site,

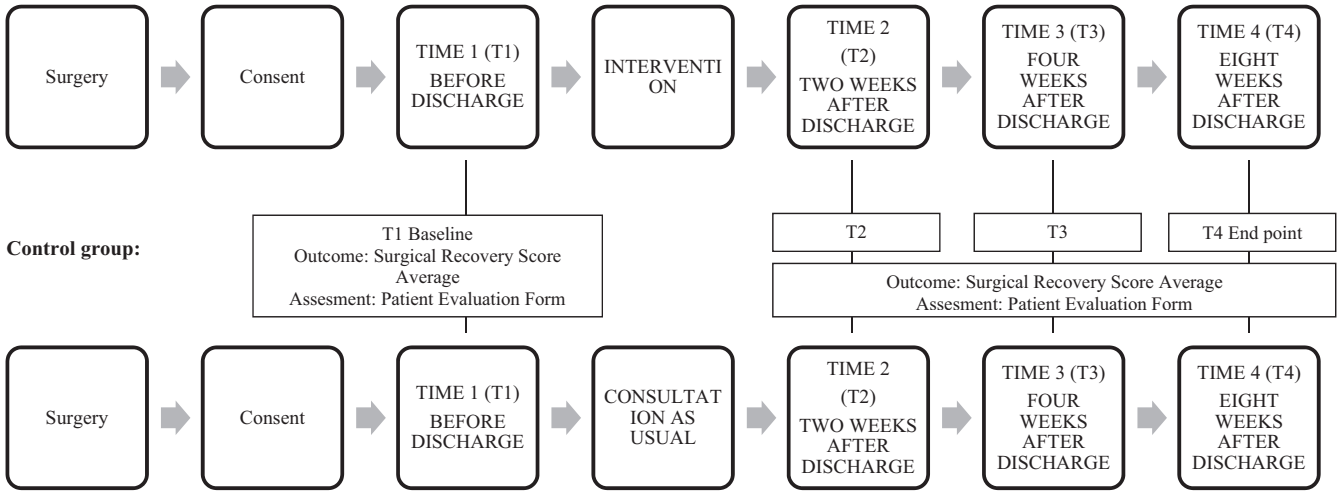


FIGURE 2 Monitoring of the intervention group

medication use and control times after discharge by the nurse or doctor, without the use of written material. The control group was informed about the aim of the study, its expected benefits and method by the researcher after being evaluated in terms of the inclusion criteria, and their verbal and written informed consent was obtained. The patient whose informed consent was obtained before discharge was evaluated in terms of surgical recovery before discharge. Before the face-to-face interview with the patient was completed, a phone number with which the patient can be contacted to perform the evaluations at the second, fourth and 8 weeks was obtained; calls were made by the researcher and took 10 min on average. The implementation at the second, fourth and 8 weeks after the discharge was continued as in the intervention group.

3.10 | Statistical analysis

The data obtained in the study were analyzed in the Statistical Package for the Social Sciences (SPSS) for Windows 19 package program (IBM no: 10.255.255.30). The analysis results were assessed at 95% confidence interval and at the significance level of $p < 0.05$. As the frequency distributions based on the sociodemographic characteristics of patients who participated in the study were between Skewness and Kurtosis values (−2;+2), they were normally distributed. The frequency, percentage, mean and standard deviation analyses were made in the descriptive analyses of data obtained. Fisher's exact test or chi-square test were used in the analysis of categorical data; Student's *t*-test in independent samples was used in the analysis of numerical data. The ANOVA test was used for analysis of repeated measurements.

4 | RESULTS

Thirty-eight patients in intervention group and 40 patients in control group enrolled in the study; all patients finished the study.

4.1 | Sociodemographic variables

Chi-square and Fisher's exact test values of the sociodemographic characteristics and clinical characteristics of the patients in the intervention and control groups are shown in Table 1.

4.2 | Distribution of defining characteristics of surgical recovery of patients at T1, T2, T3 and T4

Chi-square and Fisher's exact test values of the frequencies and percentages of the questions related to delayed surgical recovery among patients in the intervention and control groups are shown in Table 2. The intervention group reported milder levels of distress than the control group in terms of postponing the return to home/work activities, needing help to perform self-care practices, loss of appetite with nausea, difficulty moving around, pain or discomfort and fatigue. There was no difference between two groups about the deteriorated recovery of the surgical area and loss of appetite without nausea. Although there was a statistically significant decrease at T1 and T4 in terms of postponing the return to home/work activities, needing help to perform self-care practices, loss of appetite with nausea, difficulty moving around, pain or discomfort and fatigue, there were no changes in terms of evidence about the deteriorate recovery of the surgical area and loss of appetite without nausea.

4.3 | Primary outcomes

The mean surgical recovery scores of the patients in the intervention group were 29.7 ± 3.1, 36.9 ± 0.4, 40.3 ± 0.3 and 41.8 ± 0.3 at times T1, T2, T3 and T4, respectively. The mean scores of the control group were 28.4 ± 3.4, 33.7 ± 0.4, 36.3 ± 0.4 and 38.1 ± 0.4 at the aforementioned times, respectively. The surgical recovery scores of the patients in both groups at T1, T2, T3 and T4 are given in Table 3.

TABLE 2 Distribution of defining characteristics of surgical recovery of patients at T1, T2, T3, T4

Distribution of defining characteristics of delayed surgical recovery/ times	Severity of distress	T1				T2				T3				T4			
		Intervention group (n = 38)	Control Group (*n* = 40)			Intervention group (*n* = 38)	Control Group (*n* = 40)			Intervention group (*n* = 38)	Control Group (*n* = 40)			Intervention group (*n* = 38)	Control Group (*n* = 40)		
		n (%)	*n* (%)	X^2	*p*	*n* (%)	*n* (%)	X^2	*p*	*n* (%)	*n* (%)	X^2	*p*	*n* (%)	*n* (%)	X^2	*p*
Postpones resumption of work/ employment activities	Severe	1 (2.6)	2 (5)	3.615	0.306	–	–	**18.182**	**0.000***	–	–	**27.811**	**0.000***	–	–	**36.201**	**0.000***
	Substantial	**25 (65.8)**	**32 (80)**			7 (18.4)	15 (37.5)			1 (2.6)	4 (10)			–	4 (10)		
	Moderate	11 (28.9)	6 (15)			15 (39.5)	**24 (60)**			8 (21.1)	**29 (72.5)**			3 (7.9)	**19 (47.5)**		
	Mild	1 (2.6)	–			**16 (42.1)**	1 (2.5)			**25 (65.8)**	7 (17.5)			10 (26.3)	15 (37.5)		
	None	–	–			–	–			4 (10.5)	–			**25 (65.8)**	2 (5)		
Perceives that more time is needed to activities	Severe	3 (7.9)	3 (7.5)	0.468	0.792	–	–	**23.123**	**0.000***	–	–	**23.070**	**0.000***	–	–	**21.396**	**0.000***
	Substantial	**25 (65.8)**	**29 (72.5)**			8 (21.1)	15 (37.5)			2 (5.3)	4 (10)			–	3 (7.5)		
	Moderate	10 (26.3)	8 (20)			11 (28.9)	**24 (60)**			7 (18.4)	**26 (45)**			4 (10.5)	17 (42.5)		
	Mild	–	–			**19 (50)**	1 (2.5)			**22 (57.9)**	10 (25)			**21 (55.3)**	**19 (47.5)**		
	None	–	–			–	–			7 (18.4)	–			13 (34.2)	1 (2.5)		
Requires help to complete self-care	Severe	1 (2.6)	5 (12.5)	**8.305**	**0.040***	–	–	**10.135**	**0.017***	–	1 (2.5)	**9.507**	**0.023***	–	–	**23.009**	**0.000***
	Substantial	12 (31.6)	**20 (50)**			3 (7.9)	7 (17.5)			–	–			–	1 (2.5)		
	Moderate	**23 (60.5)**	15 (37.5)			11 (28.9)	**21 (52.5)**			5 (13.2)	14 (35)			1 (2.6)	9 (22.5)		
	Mild	2 (5.3)	–			**19 (50)**	12 (30)			**19 (50)**	**20 (50)**			12 (31.6)	**24 (60)**		
	None	–	–			–	–			14 (36.8)	5 (12.5)			**25 (65.8)**	6 (15)		
Evidence of interrupted healing of surgical area	Severe	–	–	2.205	0.332	–	–	2.673**	0.201**	–	–	0.296**	1.000**	–	–	1.950**	0.494**
	Substantial	1 (2.6)	–			–	–			–	–			–	–		
	Moderate	–	–			–	–			–	–			–	–		
	Mild	8 (21.1)	5 (12.5)			1 (2.6)	5 (12.5)			1 (2.6)	2 (5)			–	2 (5)		
	None	**29 (76.3)**	**35 (87.5)**			**37 (97.4)**	**35 (87.5)**			**37 (97.4)**	**38 (95)**			**38 (100)**	**38 (95)**		
Loss of appetite with nausea	Severe	1 (2.6)	–	2.757	0.599	–	–	4.107**	0.060**	–	–	**5.759****	**0.029****	–	–	1.764**	0.184**
	Substantial	1 (2.6)	2 (5)			–	–			–	–			–	–		
	Moderate	6 (15.8)	7 (17.5)			–	–			–	–			–	–		
	Mild	**19 (50)**	**15 (37.5)**			5 (13.2)	13 (32.5)			1 (2.6)	8 (20)			1 (2.6)	4 (10)		
	None	11 (28.9)	16 (40)			**33 (86.8)**	**27 (67.5)**			**37 (97.4)**	**32 (80)**			**37 (97.4)**	**36 (90)**		
Loss of appetite with nause–a	Severe	–	–	3.665	0.300	–	–	4.359	0.113	–	–	4.802	0.091	–	–	0.199	0.781
	Substantial	1 (2.6)	5 (12.5)			–	–			–	–			–	–		
	Moderate	5 (13.2)	5 (12.5)			2 (5.3)	4 (10)			–	2 (5)			–	–		
	Mild	**20 (52.6)**	**15 (37.5)**			10 (26.3)	**18 (45)**			5 (13.2)	11 (27.5)			7 (18.4)	9 (22.5)		
	None	12 (31.6)	**15 (37.5)**			**26 (68.4)**	**18 (45)**			**33 (86.8)**	**27 (67.5)**			**31 (81.6)**	**31 (77.5)**		

(Continues)

TABLE 2 (Continued)

Distribution of defining characteristics of delayed surgical recovery/ times	Severity of distress	T1				T2				T3				T4			
		Intervention group (n = 38)	Control Group (*n* = 40)			Intervention group (*n* = 38)	Control Group (*n* = 40)			Intervention group (*n* = 38)	Control Group (*n* = 40)			Intervention group (*n* = 38)	Control Group (*n* = 40)		
		n (%)	*n* (%)	X^2	*p*	*n* (%)	*n* (%)	X^2	*p*	*n* (%)	*n* (%)	X^2	*p*	*n* (%)	*n* (%)	X^2	*p*
–Difficulty moving about	Severe	1 (2.6)	–	**10.642**	**0.031***	–	–	**7.483**	**0.020***	–	–	**9.006**	**0.011**	–	–	2.807	0.246
	Substantial	2 (5.3)	9 (22.5)			–	–			–	–			–	–		
	Moderate	13 (34.2)	**20 (50)**			1 (2.6)	4 (10)			–	4 (10)			1 (2.6)	4 (10)		
	Mild	**17 (44.7)**	9 (22.5)			14 (36.8)	**24 (60)**			6 (15.8)	14 (35)			9 (23.7)	9 (22.5)		
	None	5 (13.2)	2 (5)			**23 (60.5)**	12 (30)			**32 (84.2)**	**22 (55)**			28 (73.7)	27 (67.5)		
Pain	Severe	–	–	4.869	0.182	–	–			–	–	6.000	0.112	–	–	1.768	0.413
	Substantial	–	2 (5)			–	–	**10,722**	**0.005***	–	1 (2.5)			–	–		
	Moderate	**17 (44.7)**	13 (32.5)			–	7 (17.5)			–	3 (7.5)			1 (2.6)	4 (10)		
	Mild	16 (42.1)	**14 (35)**			**21 (55.3)**	11 (27.5)			9 (23.7)	14 (35)			9 (23.7)	9 (22.5)		
	None	5 (13.2)	11 (27.5)			17 (44.7)	22 (55)			29 (76.3)	22 (55)			28 (73.7)	27 (67.5)		
Fatigue	Severe	3 (7.9)	10 (25)	7.645	0.054	–	–	**11.469**	**0.009***	–	–	**24.198**	**0.000***	–	–	**11.310**	**0.10***
	Substantial	18 (47.4)	22 (55)			3 (7.9)	13 (32.5)			–	6 (15)			–	1 (2.5)		
	Moderate	16 (42.1)	7 (17.5)			**21 (55.3)**	**21 (52.2)**			6 (15.8)	**21 (52.5)**			6 (15.8)	18 (45)		
	Mild	1 (2.6)	1 (2.5)			14 (36.8)	5 (12.5)			**27 (71.1)**	13 (32.5)			**26 (68.4)**	**20 (50)**		
	None	–	–			–	1 (2.5)			5 (13.2)	–			6 (15.8)	1 (2.5)		

Note: Data is expressed as % for each group. The *p*-value reflects chi-square analysis of surgical recovery status in the two groups; all complaints are analysed as X^2 or **Fisher's exact test; the * indicates a $p < 0.05$ between two groups.

TABLE 3 Distribution of changes in the mean score of surgical recovery before and after intervention in the intervention and in the control groups

The mean score of surgical Recovery[a]/times	T1	T2	T3	T4	Test value	*p*-Value[b]
Intervention Group ($n = 38$)	29.7 ± 3.1	36.9 ± 0.4	40.3 ± 0.3	41.8 ± 0. 3	F = 161.984	**0.000***
Control Group ($n = 40$)	28.4 ± 3.4	33.7 ± 0.4	36.3 ± 0.4	38.1 ± 0.4	F = 325.296	**0.000***
Test value	0.085	**0.000***	**0.000***	**0.000***		
p-Value[c]	0.085	**0.000***	**0.000***	**0.000***		

[a]Average ± standard deviation.
[b]ANOVA test.
[c]*T*-test.
* and Bold values indicate significant differences at $p < 0.05$.

The study determined that surgical recovery scores increased between T1 and T4 in the intervention and control groups. Considering the inter-group comparisons of the recovery scores, there was no significance at T1, whereas mean surgical recovery scores of the intervention group at T2, T3 and T4 were significantly high.

5 | DISCUSSION

The study results indicated that the surgical recovery scores of patients in the intervention and control groups significantly increased during the study and that the surgical recovery scores of patients in the intervention group were higher than those of the control group.

Problems that are often experienced by patients who undergo gastric and colorectal cancer surgery, such as nausea, pain, fatigue and loss of appetite, may cause slower recovery and delays in their return to daily routines and work (Delphino et al., 2015; Kahokehr et al., 2010; McGrath et al., 2017; Santana et al., 2018). Some studies have reported that postponing activities at home or work indicate the interruption of surgical recovery (Norlyk & Harder, 2011; Santana et al., 2018). Carrillo and Santamaría (2019) found that very few of the patients who had undergone gastric or colorectal cancer surgery returned to their jobs. The present study showed that patients in the intervention and control groups reported mild distress in terms of postponing resumption of work/employment activities, whereas patients in the intervention group reported milder level of distress than those in the control group. The reason why the results of this study differ from published literature might be that discharge training given to the intervention group increased their autonomy and resulted less often in postponing resumption of work/employment activities.

Preconceptions of the recovery process based on the surgical procedure might be affected negatively among patients who had undergone gastric or colorectal cancer surgery (Norlyk & Harder, 2011). Patients might think that they are not fully recovered or that they need more time to recover after their discharge (Delphino et al., 2015). This study showed that the intervention and control groups reported mild distress about the problem described as perceiving that more time is needed to recover and that there was a statistically significant difference between the groups at the times T2, T3 and T4. The reason for this difference can be suggested that the discharge training given support positive emotions related to recovery in patients.

Patients who had undergone gastric or colorectal cancer surgery may experience losses in their self-care abilities to the common post-discharge problems such as pain, fatigue and the existence of incision, and they might need help to maintain their daily life activities such as maintaining personal hygiene, dressing and undressing (Açıksöz & Uzun, 2007; Delphino et al., 2015; Williams, 2008). Studies have reported that there is a statistically significant correlation between the patients' self-care levels and general health outcomes and that insufficient self-care management after discharge might cause delay in recovery (Güçlü & Kurşun, 2017; Santos et al., 2018). Other studies have shown that the rate of gastric or colorectal cancer surgery patients' maintenance of their daily activities and receiving support for their home care varied between 74.6% and 85.2% (Dal et al., 2012; Güçlü & Kurşun, 2017). Wennström et al. (2010) reported that their study patients' abilities to perform self-care practices by oneself after discharge diminished in the first week; however, they did not need help with their self-care by the third week. Dal et al. (2012) found that 40.8% of patients who were discharged after surgery reported problems about self-care in the first month. Santana et al. (2018) reported that patients needed help for their self-care in the first 24 to 48 h after the surgery, but this need significantly decreased at the fourth and 8 weeks after surgery. The present study showed that the intervention and control groups reported milder distress about requiring help to complete self-care during the follow-up and that the patients in the intervention group had no distress at the end of the follow-up while there was a statistically significant difference between the groups at the times of T2, T3 and T4. All patients in both groups had a caregiver provide confidence and independence, and caregivers' participation in the discharge training might have contributed to maintaining the home care of patients and their resumption of daily activities.

Symptomatic findings such as disconnection of sutures in the surgical area, hyperaemia, oedema and infection in the surgical area indicate deteriorated recovery in that area; the emergence of surgical

site infections occurs between the 13th and 30th days post-surgery (Delphino et al., 2015; Santana, Delphino, et al., 2014). Patients discharged after surgery should be followed up in terms of these symptoms and findings for the full extent of the recovery period (Santana & de Oliveira Lopes, 2015). Problems related to recovery of the surgical area after discharge mostly appear due to patients being insufficiently informed (Williams, 2008). Pedrazzani et al. (2007) reported that they observed surgical site infection symptoms in 2.3% of patients who had undergone gastrectomy. Williams (2008) found that 13% of patients returned to the hospital with deteriorated recovery of the surgical site in 3 weeks after discharge. Allvin et al. (2009) reported that the incidence rate of surgical site infection symptoms among patients who had undergone colorectal cancer surgery was 27.6%. Tanner et al. (2009) stated that 30% of patients who had undergone colorectal surgery and had stoma experienced surgical site infection symptoms and findings. In the study by Sasaki et al. (2011), 76% of patients had evidence about deteriorated recovery of surgical site after discharge; this evidence appeared in the second week after discharge in 23% of the patients. Dal et al. (2012) showed that 60.4% of patients who had undergone surgery reported problems related to surgical site infection. The present study showed that almost none of the patients in both groups reported distress about evidence of interrupted healing of surgical area (e.g. red, indurated, draining and immobilized) during follow-up and that there was no statistically significant difference between the groups at the times of T2, T3 and T4. The reason why the results of the present study and the information in the literature differ might be that the control group was informed about wound care in the score of clinical monitoring standards whereas the intervention group was informed about wound care in the scope of verbal and written discharge training, or that the patients were administered prophylactic antibiotics in the post-surgery period.

Gastric and colorectal cancer surgeries are surgical procedures that negatively affect a patient's gastrointestinal tract's reaction to changes in liquid and food intake; thus, patients often report loss of appetite with or without nausea after surgery (Carrillo & Santamaría, 2019; Norlyk & Harder, 2011; Olsson et al., 2002; Santana et al., 2018; Santana, Amaral, et al., 2014). Wennström et al. (2010) stated that 20% of patients experienced nausea before discharge in the post-surgery period. Calderón et al. (2019) reported that 10% of patients with colorectal cancer and 28% of patients with gastric-oesophageal cancer experienced nausea and/or vomiting after discharge. Wennström et al. (2010) determined that 29% of patients experienced severe nausea in the first week after discharge but by the third week post-discharge had no problems with nausea. The present study showed that both groups reported mild distress about loss of appetite with nausea during the follow-up period; however, the patients in the intervention group had milder levels of distress at measurement points T2, T3 and T4 than the control group. The reason might be the briefing provided about the educational booklet given to the intervention group. The present study results about the loss of appetite with nausea are overall in line with the literature (Santana et al., 2018; Wennström et al., 2010).

Santana et al. (2018) reported that all patients had complaints about loss of appetite from the twenty-fourth to forty-eighth hour post-surgery until 8 weeks after the surgery. Pringle and Swan (2001) stated that 30% of the study patients with colorectal cancer and stoma experienced loss of appetite in the first week after the discharge. Calderón et al. (2019) reported that 37% of patients with colorectal cancer and 59% of the patients with gastric-oesophageal cancer experienced post-discharge loss of appetite. The present study showed no statistically significant difference between the groups in terms of reporting loss of appetite without nausea during the follow-up in the evaluations at time points T2, T3 and T4. The reason for absence of a difference between groups might be that the patients in the intervention and control groups were diagnosed with a similar type of cancer and had undergone similar surgical interventions.

Patients may have difficulty moving around during the post-surgical recovery period (Delphino et al., 2015). Other authors reported that discharge training, including daily activities for the maintenance of postoperative recovery at home, will increase the autonomy of surgical patients and improve postoperative recovery results (Kang et al., 2018). Wennström et al. (2010) stated that their study patients had difficulty walking and lifting heavy objects in the first week post-discharge but did not report any problems in the fourth week. Williams (2008) stated that 2% of the patients returned to hospitals in 3 weeks after discharge because of problems related to activity adjustments. Dal et al. (2012) reported that 32.1% of patients experience problems related to exercising and activities in the first month after post-surgery discharge. The present study showed that there was a statistically significant difference between the groups in terms of having difficulty in moving around in the evaluations at post-surgical time points T1, T2 and T3 during the follow-up. However, there was no difference in the T4 evaluation. This might indicate that patients returned to their normal lives in the fourth week after discharge.

Studies in the literature have reported that patients aged 60 and older commonly experienced pain after surgeries such as colectomy and laparotomy (Couceiro et al., 2009; Santana et al., 2018). Lam et al. (2001) determined that informing patients before discharge led them to have better pain management after discharge; these authors recommended follow-up of patients at home after providing them with written materials. Pringle and Swan (2001) showed that 80% of patients with colorectal cancer and stoma experienced pain in the first week after discharge. Wennström et al. (2010) stated that patients experienced the most severe pain in the first weeks after discharge, but that they managed pain better towards the end of the fourth week. The present study showed that there was no statistically significant difference between the groups in terms of pain in the T1 evaluation, whereas there was a statistically significant difference in the T2 evaluation. This might be related to pain level being subjective: individuals have different perceptions of pain.

Calderón et al. (2019) reported that 42% of patients with colorectal cancer and 56% of patients with gastric-oesophageal cancer experienced fatigue after discharge. The present study showed

no statistically significant difference between the intervention and control groups in terms of fatigue in the T1 evaluation during the follow-up; however, a statistically significant difference was found in the T2, T3 and T4 evaluations. The patients in the intervention group reported milder level of distress compared to the control group. This difference might be attributable the recommendations that discharge training provided about resting and daily life; thus, patients can plan and manage their daily energy effectively.

6 | LIMITATION

Randomization of patients into groups and the use of valid-reliable measurement tools in the development of discharge education are the strengths of this study. The limitations were selecting the sample from only one hospital, working with a small sample, limited diversity of cases, conducting the evaluation based on patients' self-statements, impossibility of the blinding of patients data collectors, standardization of the discharge training and the inability to check personal differences that may occur in home care.

7 | CONCLUSION

This pilot study showed that discharge training affected the post-surgery recovery of patients who had undergone oncological surgery. The authors observed that the surgical recovery scores of patients in the intervention and control groups significantly increased during the study and that the surgical recovery scores of patients in the intervention group were higher than those of the control group patients. Thus, the study hypothesis H_1 was accepted. These results show that similar studies should be conducted with larger patient samples and with different conditions requiring surgery. Post-surgery discharge training and home follow-up can meet the need for post-surgery home care, facilitate the follow-up of patients at home and thereby early detection of complications in patients with limited access to the hospital. The results of this study can be used in practice to improve surgical recovery of patients who had undergone oncological surgery.

AUTHOR CONTRIBUTIONS

EA and NG designed research; EA and NG conducted research; EA analysed data; EA and NG wrote the first draft of the manuscript; and EA and NG had primary responsibility for final content. All authors read and approved the final manuscript.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

DATA AVAILABILITY STATEMENT

The data used to support the findings of this study are available from the corresponding author upon request. The data are not publicly available due to privacy or ethical restrictions.

ETHICAL APPROVAL

The Aydin Adnan Menderes Üniversitesi Faculty of Nursing Non-invasive Ethics Comittee approved and permitted the study with a reference number (50107718-050.04.04-2018/029).

RESEARCH REPORTING CHECKLIST

Guidelines for reporting parallel-group randomized trials.

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