Nuray Turan, PhD, BSN
Türkinaz Atabek Aştı, PhD, BSN

The Effect of Abdominal Massage on Constipation and Quality of Life

ABSTRACT

This study was a randomized controlled trial aimed to find the impact of abdominal massage application on constipation and quality of life among patients. The sample included 30 intervention (abdominal massage) and 30 control subjects. To collect data, the following were utilized: Patient Information Form, Gastrointestinal Symptom Rating Scale, Constipation Severity Instrument, Bristol Scale Stool Form, Patient Assessment of Constipation Quality of Life (PAC-QOL) Scale, and European Quality of Life Instrument (EQ-5D). The data were collected from among patients in the morning and evening on the fourth, fifth, and sixth days postoperatively. No significant findings were discovered between experimental and control groups in terms of individual characteristics and characteristics that might influence constipation ($p > .05$). It was found that patients who received abdominal massage application defecated more often following their surgery than patients in the control group, which led to a statistically high level of significant difference between the groups ($p \leq .001$). It was also found that the experimental group displayed higher average PAC-QOL and EQ-5D scores on discharge. Findings indicated that abdominal massage applied to patients diagnosed with postoperative constipation reduced symptoms of constipation, decreased time intervals between defecation, and increased quality of life.

Constipation is a common problem that often has a profound effect on patients' well-being and quality of life (Lamas, Lindholm, Stenlund, Engstrom, & Jacobsson, 2009; Preece, 2002). The use of abdominal massage to help relieve constipation has been an effective therapy for several hundred years (Preece, 2002). More recently, interest in abdominal massage as an effective intervention for constipation without known side effects has resurfaced (Harrington & Haskvitz, 2006). Abdominal massage has been widely used by nurses recently (Ayaş, Leblebici, Sözay, Bayramoğlu, & Niron, 2006; Emly, Cooper, & Vail, 1998; Ernst, 1999). When abdominal massage is used in patients with constipation by nurses, patients defecate early, less pharmacological agents are used, and the quality of life improves (Richards, 1998).

Received March 27, 2014; accepted May 21, 2014.

About the authors: *Nuray Turan, PhD, BSN, is Assistant Professor, Department of Fundamentals of Nursing, Florence Nightingale Faculty of Nursing, Istanbul University, Istanbul, Turkey.*

Türkinaz Atabek Aştı, PhD, BSN, is Professor, Department of Nursing, Faculty of Health Sciences, Bezmialem Vakıf University, Istanbul, Turkey.

The authors declare no conflicts of interest.

Correspondence to: *Nuray Turan, PhD, BSN, Department of Fundamentals of Nursing, Florence Nightingale Faculty of Nursing, Istanbul University, Abide-i Hürriyet Cad, 34381, Istanbul/Turkey (nkaraman@istanbul.edu.tr).*

DOI: 10.1097/SGA.0000000000000202

Background

The frequency of constipation ranging from 2% to 28% is a problem peculiar to the gastrointestinal (GI) system. Women compared with men and elderly compared with young experience more frequent complaints of constipation (Kaya, Kaya, Turan, Şirin, & Güloğlu, 2013; Lamas et al., 2010; Turan et al., 2011; Yurdakul, 2004). The symptoms include scybalum (hard stool mass) and defecation less than three times a week, abdominal and rectal pain, decrease in intestinal noise, rectal fullness, pressure in rectum, stress and pain while defecation, feeling full, loss of appetite, headache, fatigue, and hemorrhoid (Kaya, 2011; H. Kaya, 2012; Yurdakul, 2004).

Constipation may be brought on by a change in diet, medication, daily routine, exercise patterns, acute emotional stress, surgery, medication, or disease processes (H. Kaya, 2012; McClurg, Hagen, Hawkins, & Lowe-Strong, 2011; Sinclair, 2011). Constipation also has a significant impact on the person's quality of life and well-being and can range from a headache and

fatigue to feelings of being bloated; experiencing loss of appetite, nausea, and vomiting; and can exacerbate other symptoms such as limb spasticity or bladder dysfunction (Preece, 2002). Several studies have found correlation between constipation and decreased health-related quality of life (Dedeli, Turan, Fadıloğlu, & Bor, 2007; Glia & Lindberg, 1997; O'Keefe, Talley, Zinsmeister, & Jacobsen, 1995; Wald et al., 2007).

Constipation is also commonly known to be a problem for a range of orthopedic patients. Orthopedic patients with reduced mobility and who have reduced food or fluid intake, use opioid analgesic medications, use a bedpan in the early postoperative period, and are older than the average surgical patients are prone to constipation (Atabek, 1994; Şendir, Büyükyılmaz, Aştı, Gürpınar, & Yazgan, 2012).

Nurses have an important role in care and treatment of constipation (Kaya et al., 2013). However, constipation management in nursing care is problematic because of the individual variability of bowel habits (Kaçmaz & Kaşıkçı, 2007; Lamas et al., 2009). Abdominal massage, which is an efficient way to manage constipation, is widely used by nurses, especially recently (Ayaş et al., 2006; Ernst, 1999; Resedence, Brocklehurst, & O'Neil, 1993). Abdominal massage is a noninvasive intervention stimulating peristalsis as a result of administering patting, kneading, and vibration clockwise to the abdomen (Sinclair, 2011; Tuna, 2011; Uysal, Eşer, & Akpınar, 2012). Abdominal massage of the ascending, transverse, and descending colons may be effective in regulating bowel movements and decreasing medication used for constipation through improvements in intestinal motility when performed on a daily basis (Harrington & Haskvitz, 2006; Kanbir, 1998; Kyle, 2011; Preece, 2002; Richards, 1998).

When abdominal massage is used, less pharmacological agents are used and quality of life improves (Kyle, 2011; Sinclair, 2011). A review of the literature in Turkey shows that there were few studies about nursing interventions related to the effect of abdominal massage on constipation. This study therefore investigates, the effect of abdominal massage on individuals with constipation in regards to GI functions, quality of life, and the use of laxatives.

Methods

The purpose of this experimental study is to identify the effect of abdominal massage on constipation and the quality of life of patients attending orthopedic and trauma clinics who have undergone surgery. The research hypotheses are as follows:

Hypothesis 1 (H1): The use of pharmacological agents is less in patients with a constipation nursing diagnosis who use abdominal massage than in patients who do not use abdominal massage.

Hypothesis 2 (H2): Gastrointestinal functions are better in patients with a constipation nursing diagnosis who use abdominal massage than in patients who do not use abdominal massage.

Hypothesis 3 (H3): The quality of life is better in patients with a constipation nursing diagnosis who use abdominal massage than in patients who do not use abdominal massage.

Ethical Permissions

Written consent was obtained from the Department of Orthopedics and Traumatology in hospitals where this research was conducted. Ethical approval was obtained from the hospital ethics committee and necessary permissions were taken from the local health authority. The participant patients in experimental and control groups were informed on the fourth day following their surgery about the purpose of their research, the duration and what would be expected from them, and how and where the data obtained would be used via a "volunteer information leaflet." Written permission was obtained from the patients who chose to participate in the research.

Setting and Sample

This randomized controlled study was conducted between March 2010 and June 2012 in Orthopedics and Traumatology Clinics of university training and research hospitals that are located in Istanbul. The target population includes patients in orthopedics and trauma clinics of training and research hospitals who have not defecated in the first 3 days after their surgery. The sample consisted of experimental and control groups that were randomly chosen among those patients who met the sample criteria. To do this, the researcher wrote down "test" or "control" on pieces of paper that were cut similarly, folded, and placed into a nontransparent bag. For every patient who met the sample criteria and agreed to participate in the study, the researcher blindly chose a piece of paper from the bag and determined the subject's assignment to the "experimental group" or "control group".

Sample criteria for the patient included: (1) aged 18 years or older; (2) had no problem that hindered cognitive, emotional, or verbal communication; (3) had undergone a surgery in orthopedics and traumatology clinics and was hospitalized for treatment; (4) had no history of psychiatric disease, abdominal hernia, intestinal cancer, or laparotomy; (5) had been unable to defecate for the first 3 days following the surgery; (6) had not used any pharmacological and nonpharmacological agents involving laxatives; and (7) was able to have a treatment for at least 7 days.

The study was conducted with 60 subjects, 30 in the experimental group and 30 in the control group. The power of the research was calculated using the GPower 3.1 software program. For the Gastrointestinal Symptom Rating Scale total score, the effect was found to be 0.52. In this framework, when 30 observations were made in a group, the power of the test was found as (1-β) 0.63 within a $p = .05$ level of significance. For the Gastrointestinal Symptom Rating Scale Abdominal Pain subdimension, the effect was found as 0.65. In this framework, when 30 observations were made in group, the power of the test was found as (1-β) 0.80 within a $p = .05$ level of significance. For the Gastrointestinal Symptom Rating Scale Reflux subdimension, the effect was found as 0.94. In this framework, when 30 observations were made in group, the power of the test was found as (1-β) 0.97 within a $p = .05$ level of significance.

Data Collection Instruments

When collecting data, the Patient Information Form, Gastrointestinal Symptom Rating Scale (GSRS), Constipation Severity Instrument (CSI), Bristol Stool Scale, Patient Assessment of Constipation Quality of Life (PAC-QOL) Scale, and EuroQol European Quality of Life Instrument (EQ-5D) were used.

Patient Information Form

The Patient Information Form was created in accordance with existing literature (Kaya & Turan, 2011; N. Kaya, 2012; Kaya et al., 2013; Turan et al., 2011) and involved questions regarding the patients' age, gender, body mass index, marital status, educational background, income status, and his/her hospital duration.

Gastrointestinal Symptom Rating Scale

The validity and reliability of the scale created by Revicki, Wood, Wiklund, and Crawley (1998), which aims to evaluate the common symptoms in patients with GI system disorders, was translated to Turkish by Turan and Aştı (2011). The GSRS a 5-score Likert scale with 15 questions and options starting with "no problem" and ends with "severe discomfort." In the GSRS, the patient is questioned about how he or she felt regarding any GI problems in the last week. The GSRS has five dimensions: "diarrhea," "indigestion," "constipation," "abdominal pain," and "reflux." A high score indicates that the symptoms were severe (Kaya & Turan, 2011; Revicki et al., 1998; Turan & Aştı, 2011).

Constipation Severity Instrument

Turkish validity and reliability of the scale created by Varma et al. (2008) was established by Kaya and Turan (2011). The Constipation Severity Instrument aims to determine how often the patients defecate, the volume of defecation, and how hard it is to defecate for the patient. The Constipation Severity Instrument has three dimensions: "obstructive defecation," "colonic inertia," and "pain." High scores indicate that the symptoms were severe (Kaya & Turan, 2011; Turan et al., 2011; Varma et al., 2008).

Patient Assessment of Constipation Quality of Life

Developed by Marquis et al. (2005) to determine the effect of constipation on the quality of life, the Patient Assessment of Constipation Quality of Life scale has established validity and reliability by Dedeli et al. (2007) in Turkish. The scale consists of four dimensions: "anxiety," "physical discomfort," "psychosocial discomfort," and "satisfaction." As the scores from the scale increase, it is assumed that the quality of life is low (Kaya & Turan, 2011; Turan et al., 2011).

EuroQol-General Health Scale

The EuroQol-General Health Scale consists of a system that defines five different dimensions including "movement," "self-care," "routine work," "pain/discomfort," and "anxiety/depression." Each dimension is rated as follows: "no problem" = 1, "some problems" = 2, "severe problems" = 3; subjects can choose only one. The score received is indicated as EQ-5_{DSKOR} (Bolol, Ülgen, Turan, Kaya, & Kaya, 2010; Brooks, 1996). Because the scale can be used in other countries, a visual analog scale, which enables patients to express their subjective health perceptions and is shaped like a calibrated and vertical thermometer, is included in the scale. This part of the scale is reflected as $EuroQol_{VAS}$ (Brooks, 1996).

Bristol Stool Form Scale

Developed by a group of gastroenterologists at Bristol University in England, the Bristol Stool Form Scale is used to evaluate the shape of stool, indicate changes in bowel habits, and collect information about potential pathological entities. This scale is designed to classify the bowel movements of an individual in seven different categories. Type 1 and Type 2 indicate "constipation"; Type 3 and Type 4 indicate "normal defecation"; and Type 5, Type 6, and Type 7 indicate "diarrhea." It is accepted that there is a direct correlation between the form of stool and the period of time it stays in the bowel (Lewis & Heaton, 1997).

Procedure

Experimental Group

The patients hospitalized in Orthopedics and Traumatology Clinics who had undergone a surgery and met the sample criteria were identified. An experimental group was randomly chosen among these patients. Four days after surgery and in the morning,

the subjects were given the Patient Information Form, GSRS, CSI, PAC-QOL, and EuroQol European Quality of Life Instrument. Four days after surgery, consenting subjects received abdominal massage for 3 days in the morning and evening for 15 minutes and totaling 6 times. After the intervention, the subjects who defecated in this period were administered the Bristol Stool Form Scale and the stool was evaluated. Six days after surgery, the GSRS was given to the subjects to evaluate the effect of abdominal massage. At discharge from the hospital, the PAC-QOL and EuroQol were administered to the subjects (Figure 1).

Abdominal Massage Application

According to "Abdominal Massage Application Guideline" developed by Uysal et al. (2012), abdominal massage was applied to subjects who had not defecated after surgery, and these subjects were given abdominal massage 4 days after surgery for 3 days, lasting 15 minutes twice a day. It is recommended that the massage be undertaken daily with each session lasting 15 minutes (McClurg et al., 2011; Richards, 1998). Liquid petrolatum is used during the application in order to enable the researcher to move his hands on the skin of the patient easily and not cause any disturbance to the patient. During massage application, the subject was placed in a supine position with the head-of-bed angle elevated at 30°–45° (Emly, 2007; Preece, 2002; Uysal et al., 2012).

The abdominal massage was applied in a clockwise direction over the intestines on the abdominal wall. Four basic strokes are typically used in abdominal massage: stroking, effleurage, kneading, and vibration. Stroking was applied over the dermatome of the vagus nerve, iliac crests, and down both sides of the pelvis toward the groin. This was repeated several times and followed by effleurage. Effleurage strokes followed the direction of the ascending colon, across the transverse colon and down the descending colon. Kneading was applied down the descending colon, up the ascending

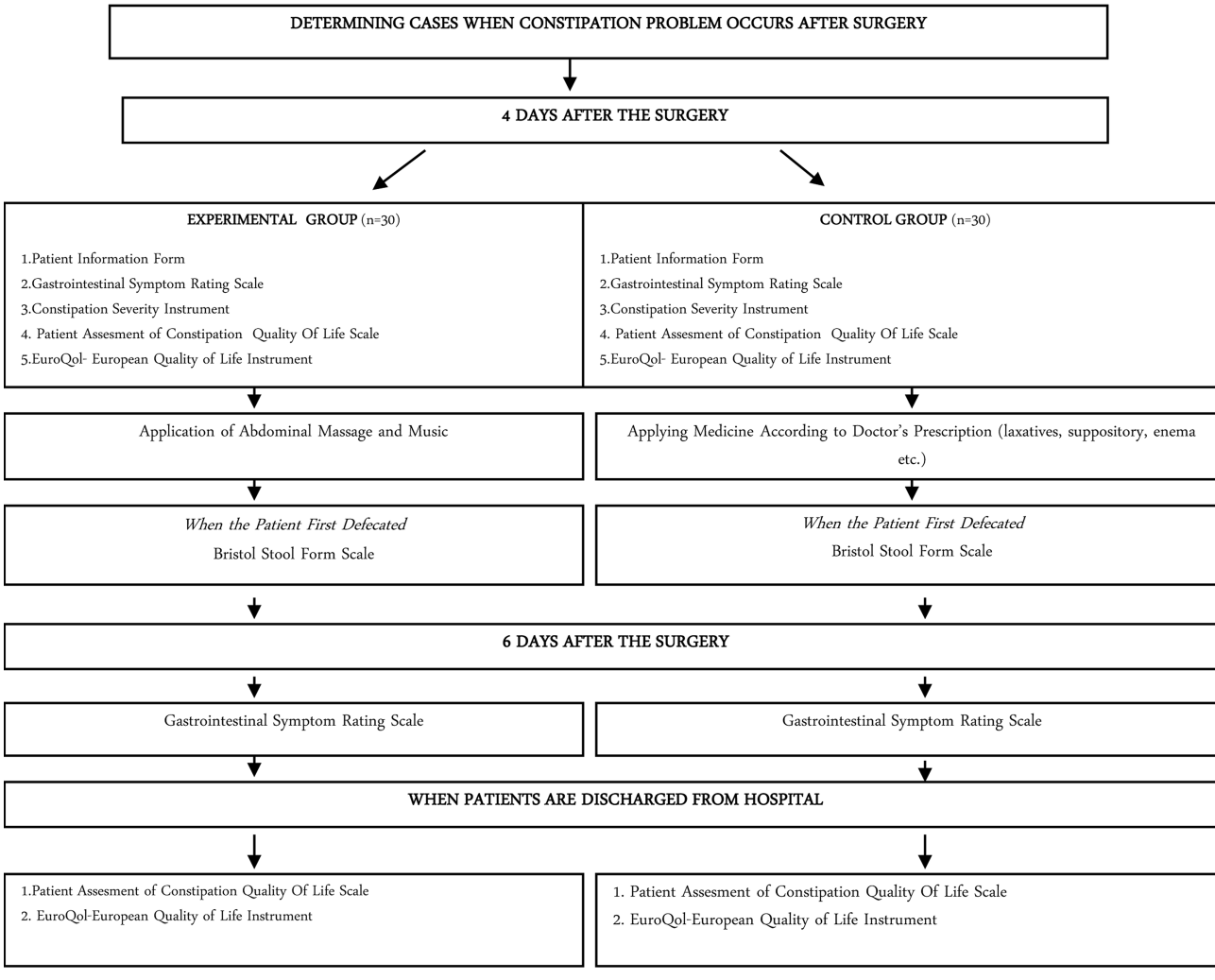

FIGURE 1. The research protocol.

colon, and down the descending colon. The massage was concluded with vibration over the abdominal wall (Preece, 2002; Uysal et al., 2012).

Control Group

Data from the subjects in the control group were collected as in the experimental group. Four days after the surgery, subjects were started on medication appropriate for routine clinical treatment such as laxative suppository and enema. Data were collected from both groups in the same way (Figure 1).

Data Analysis

When evaluating data, Statistical Package for the Social Sciences (SPSS) for Windows 16 software was used. Descriptive statistical methods (frequency, percentage, average, and standard deviation) were used. To examine normal distribution, the Kolmogorov-Smirnov distribution test was applied. To compare qualitative data, Pearson Ki-Kare test was used. When two groups were compared for quantitative data, Whitney *U* test was used to compare parameters that did not show normal distribution. For more than two groups when quantitative data was compared, the Kruskal-Wallis test was used for parameters that did not show normal distribution and Mann-Whitney *U* test was applied to find which group caused the difference. The results were evaluated with a 95% trust confidence interval and alpha set at .05.alpha set at .05.

RESULTS

Individual Characteristics of Patients

Facts regarding the individual characteristics of subjects are shown in Table 1.

Postoperative Day Four

Four days after the surgery, the experimental group was determined to have a higher GSRS abdominal pain dimension score scale (9.46 ± 2.64), the control group was above (7.73 ± 2.67) score average, and both findings were statistically significant ($p < .05$). On the GSRS Reflux dimension score scale, the dimension score average (5.60 ± 3.32) of the experimental group was higher than the control group score (3.16 ± 1.53) ($p \leq .001$) (Table 2). At four days after surgery, there was no meaningful statistical difference found between the total score averages of the GSRS diarrhea, indigestion, constipation dimensions, and nor GSRS total score averages for the experimental and control groups ($p > .05$).

Four days after the surgery, there was no statistically meaningful difference between experimental and control groups regarding CSI, PAC-QOL, and EQ-5D total scores and dimension score averages ($p > 05$) (Table 2).

Postoperative Day Six

Seventy percent of the subjects in the experimental group ($n = 21$) defecated on post-operative day four while 46.7% of the subjects in the control group defecated on the fifth day after surgery ($n = 14$) for the first time (Figure 2). According to the Bristol Stool Form Scale, the characteristics of stool in 40% of the experimental group ($n = 12$) was ($n = 12$) Type 2, while 43.3% of the control group ($n = 13$) was Type 1. A statistically meaningful difference was detected between groups for this measure ($p < .05$) (Table 3).

Six days after the surgery, the total score average of the GSRS in the experimental group was 42.36 ± 12.66; in the control group, the total score was determined as 37.20 ± 11.50. When GSRS dimensions were compared, only the experimental group GSRS indigestion dimension score average (8.00 ± 2.84) was lower than the control group score average (11.00 ± 2.76) and statistically significant ($p \leq .001$) (Table 4).

When discharged from the hospital, the PAC-QOL physical disturbance dimension score average in the experimental group (7.20 ± 3.14) was lower than the control group score average (9.60 ± 3.59) and statistically meaningful ($p < .01$). The PAC-QOL psychosocial disturbance dimension score average was lower (13.33 ± 5.22) than the control group score average (15.70 ± 6.15) and statistically meaningful ($p < .05$) (Table 5). According to the EQ-5D, when EQ-$5D_{SKOR}$ and EQ_{VAS} score averages were compared, no statistically significant difference was found between these score averages ($p > .05$) (Table 5).

Four days after the surgery and after discharge, the total score average of the PAC-QOL total score average was higher than at discharge and statistically significant ($p \leq .001$). The average dimension scores for the PAC-QOL physical discomfort and anxiety were higher 4 days after the surgery in the experimental group than the average scores at discharge, and this difference was statistically significant ($p \leq .001$) (Table 5).

Four days after the surgery and at discharge, the $EQ5D_{SKOR}$ score average was low compared with the discharge score average. The increase in EQ-$5D_{SKOR}$ score was statistically significant ($p \leq .001$). Similarly, in the control group, 4 days after the surgery, the EQ-$5D_{SKOR}$ score average was lower than the discharge score average, and the difference was statistically significant ($p \leq .001$). Four days after the surgery, the average score of the EQ_{VAS} in the experimental group was determined to be lower than the discharge score average. The increase in EQ_{VAS} scores was

TABLE 1. Individual Characteristics of Subjects ($N = 60$)

	Experimental ($n = 30$)		Control ($n = 30$)		
	n	%	*n*	%	χ^2, MW, *p*
Age groups, y					
19-34	2	6.7	3	10	$\chi^2 = 2.097$
35-50	5	16.7	9	30	$p = .553$
51-66	14	46.7	12	40	
≥67	9	30	6	20	
Average age (± SD) (minimum–maximum)	57.26 ± 14.05 (minimum = 19, maximum = 79)		54.00± 13.69 (minimum = 25, maximum = 77)		MW = 383 $p = .322$
Gender					
Female	25	83.3	25	83.3	–
Male	5	16.7	5	16.7	
BMI					
Thin	1	3.3	0	0	$\chi^2 = 1.077$
Normal	6	20	7	23.3	$p = .783$
Overweight	9	30	9	30	
Obese	14	46.7	14	46.7	
BMI average (± SD) (minimum–maximum)	29.10 ± 5.73 (minimum = 18, maximum = 42)		29.23 ± 5.85 (minimum = 19, maximum = 40)		MW = 445 $p = .941$
Marital status					
Single	4	13.3	5	16.7	$\chi^2 = 0.131$
Married	26	86.7	25	83.3	$p = .718$
Level of education					
Illiterate	7	23.3	3	10	$\chi^2 = 2.473$
Literate	3	10	2	6.7	$p = .781$
Primary school	15	50	18	60	
Secondary school	2	6.7	3	10	
High school	2	6.7	3	10	
College	1	3.3	1	3.3	
Level of income					
Able to meet the expenses	8	26.7	9	30	$\chi^2 = 0.082$
Unable to meet the expenses	22	73.3	21	70	$p = .774$
Duration of hospital stay					
7-9 d	6	20.7	7	23.3	$\chi^2 = 0.287$
10-12 d	13	43.3	11	36.7	$p = .866$
≥13 d	11	36.7	12	40.0	
Type of surgery					
Major	28	93.3	27	90	$\chi^2 = 0.218$
Minor	2	6.7	3	10	$p = .640$

Note. χ^2= Chi-squared test; BMI = body mass index; MW = Mann-Whitney *U* test; SD = standard deviation.

TABLE 2. Comparison of GSRS, CSI, PAC-QOL, and EQ-5D Points of Subjects in Experimental and Control Groups on the Fourth Day of Surgery

	Experimental (n = 30)	Control (n = 30)		
	$\bar{X}$ ± SD	$\bar{X}$ ± SD	MW	p
GSRS				
Abdominal pain	9.46 ± 2.64	7.73 ± 2.67	288	.015
Reflux	5.60 ± 3.32	3.16 ± 1.53	224	.001[a]
Diarrhea	4.80 ± 2.17	4.16 ± 2.00	368	.183
Indigestion	12.46 ± 6.43	12.96 ± 5.63	410	.548
Constipation	10.03 ± 5.36	9.16 ± 4.99	417	.618
GSRS total	30.20 ± 9.87	34.36 ± 5.67	331	.077
CSI				
Obstructive defecation	9.66 ± 8.22	9.83 ± 7.18	424	.698
Colonic inertia	9.06 ± 7.06	8.73 ± 6.56	437	.841
Pain	0.33 ± 1.49	0.33 ± 1.64	450	.999
CSI total	19.06 ± 14.79	18.90 ± 13.14	430	.761
PAC-QOL				
Physical disturbance	10.70 ± 3.68	9.60 ± 4.90	360	.178
Psychosocial disturbance	16.86 ± 6.38	16.60 ± 6.95	432	.784
Anxiety	27.00 ± 10.80	24.40 ± 11.61	381	.297
Satisfaction	21.90 ± 3.29	19.96 ± 5.86	398	.431
PAC-QOL total	76.46.± 15.53	70.56 ± 21.68	323	.060
EQ-5D				
$EQ\text{-}5D_{SKOR}$	0.03 ± 0.28	0.05 ± 0.29	449	.982
EQ_{VAS}	61.50 ± 15.76	59.83 ± 16.73	416	.601

Note. CSI = Constipation Severity Instrument; EQ-5D = EuroQol European Quality of Life Instrument; GSRS = Gastrointestinal Symptom Rating Scale; MW = Mann-Whitney *U* test; PAC-QOL = Patient Assessment of Constipation Quality of Life.
[a]Correlation is significant at the .01 level (two-tailed).

statistically significant ($p \leq .001$); however, the control group's EQ_{VAS} score average was found than the discharge score average on the fourth day after surgery, and this difference was statistically significant ($p \leq .001$) (Table 5).

DISCUSSION

This study was conducted to determine the effect of abdominal massage on constipation and quality of life for hospitalized patients who have undergone orthopedic or trauma surgery. Nurses play a pivotal role in management of constipation. There are few studies about the efficiency of abdominal massage in preventing constipation, despite the benefits as an alternative method in constipation treatment (Lamas et al., 2009; Uysal et al., 2012).

This study suggests that abdominal massage, compared with laxative, suppository, and enema, decreases the symptoms of constipation in patients who are diagnosed with postoperative constipation and shortens the defecation period and improves the quality of life. To evaluate the efficiency of abdominal massage and medicine appropriate for clinic routine (such as laxative, suppository, or enema), the GI symptoms in experimental and control groups; seriousness of constipation; and the characteristics of the quality of life and general health should be similar. For this purpose, 4 days after the surgery, data obtained from the GSRS,

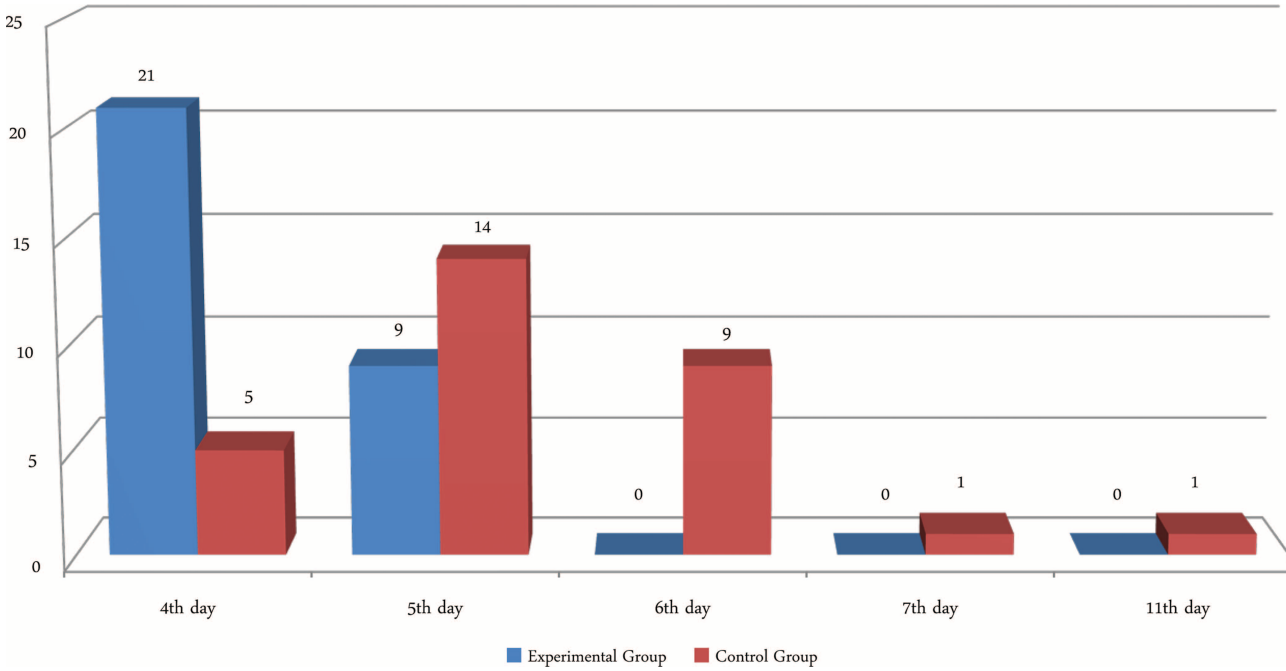

FIGURE 2. The first day of defecation for comparison groups after the surgery.

CSI, PAC-QOL, and EuroQol scales applied to the comparison groups show that the experimental and control groups correlate.

The fact that most of the subjects in the experimental group first defecated on the fourth day of surgery and the subjects in the control group defecated on the fifth day after surgery indicates that the application of abdominal massage had more effects on the patients than routine medications such as laxatives, suppository, and enema. Abdominal massage increases peristalsis and thus could be helpful for increasing bowel function and decreasing constipation (Lamas et al., 2009). Jeon and Jung (2005) conducted an experimental survey with a group of paralyzed patients, and the period of defecation was shortened in those in the experimental group who received abdominal massage (n = 15) compared with a control group (n = 15). On the contrary, laxatives are the most common strategy for managing constipation. However, long-term use of some laxatives may be associated with harmful side effects including increased constipation and fecal impaction (Sinclair, 2011).

When the characteristics of stool from the experimental and control groups were compared, it was found that most of the subjects in the experimental group have Type 2 and the subjects in the control group have Type 1 stools according to the Bristol Stool Form Scale. The Bristol Stool Form Scale is an easy to use and dependable tool when identifying stool (Lane, Czyzewski, Chumpitazi, & Shulman, 2011). According

TABLE 3. The Characteristics of Stool in Test and Control Groups According to Bristol Stool Scale

	Experimental (n = 30)		Control (n = 30)		Total (n = 60)		
	n	%	n	%	n	%	χ^2, p
Characteristics of stool							
Type 1	4	13.3	13	43.3	17	28.3	χ^2= 11.837
Type 2	12	40	8	26.7	20	33.4	p = .019[a]
Type 3	4	13.3	7	23.3	11	18.3	
Type 4	9	30	2	6.7	11	18.3	
Type 5	1	3.4	0	0.0	1	1.7	

[a]Correlation is significant at the .05 level (two-tailed).

TABLE 4. Comparison of GSRS Scores Between Groups at 6 Days After Surgery

	Experimental (n = 30)	Control (n = 30)		
	$\bar{X}$ ± SD	$\bar{X}$ ± SD	MW	p
Abdominal pain	5.40 ± 2.74	6.16 ± 2.30	341	.103
Reflux	3.60 ± 2.09	3.13 ± 1.57	423	.665
Diarrhea	4.66 ± 1.64	4.60 ± 1.90	417	.613
Indigestion	8.00 ± 2.84	11.00 ± 2.76	190	.000[a]
Constipation	8.53 ± 4.13	9.46 ± 2.96	358	.168
GSRS total	42.36 ± 12.66	37.20 ± 11.50	340	.102

Note. GSRS = Gastrointestinal Symptom Rating Scale; MW = Mann-Whitney *U* test.
[a]Correlation is significant at the .01 level (two-tailed).

to the scale, classification of Type 1 and Type 2 is defined as "constipation" (Lewis & Heaton, 1997). Stool aspect was correlated to intestinal transit time and not to the frequency of bowel movements. The form and frequency of stool give important indications about many important diseases ranging from GI symptoms to infections (Chumpitazi et al., 2010). In Rasmussen's study (2010), most patients were also detected as having Type 1 or Type 2 stool characteristics.

When GI symptoms were compared on the sixth day of after surgery, symptoms such as abdominal pain, reflux, diarrhea, and constipation (but not indigestion) decreased compared with the fourth day, suggesting that both abdominal massage and routine medications were effective on patients. The facts obtained from this study are parallel to the findings of the research by Lamas et al. (2009). There is only a difference between comparison groups for indigestion. This fact from the study suggests the application of abdominal massage is as effective as the use of pharmacological agents and has no other side effects. In addition, when the principle of maximizing benefit and doing no harm is taken into consideration, it is widely known that each pharmacological agent certainly has a side effect.

The fact that the quality of life in the experimental group related to constipation is lower on the physical discomfort and psychosocial discomfort dimensions than the control group suggests the positive effects of abdominal massage on constipation and its symptoms. Abdominal massage affects the abdominal muscles and bowels; in addition, it stimulates the abdominal neural network and changes the tone of bowels. In this way, the pain and discomfort caused by constipation decreases (Kyle, 2011; Sinclair, 2011; Tuna, 2011). In the study conducted by Preece (2002) with a single group (n = 15), the symptoms of 11 of the patients who received abdominal massage decreased. In another study conducted by McClurg et al. (2011) with a group of 30 patients, the researchers suggest that application of abdominal massage obviously heals constipation and its symptoms.

The fact that there was no difference in general health condition between groups when they were discharged suggests that the application of abdominal massage and the other clinical treatments have a positive effect on subjects' overall health and increases their quality of life. Abdominal massage may significantly improve quality of life: it decreased constipation and associated abdominal discomfort in patients (Harrington & Haskvitz, 2006; Preece, 2002). Since, long-term use of some laxatives may be associated with harmful side effects including increased constipation and fecal impaction (Sinclair, 2011), abdominal massage is a valuable intervention.

The increase in the quality of life of subjects in the experimental group from the fourth day until they were discharged indicates that the application of abdominal massage has an effect on constipation and its symptoms, and this condition has a positive effect on their health. In the research by Albers et al. (2006) on paraplegic patients, it was also shown that the application of abdominal massage increases the comfort level of patients. In research by Ayaş et al. (2006), 24 patients with spinal cord injury were applied abdominal massage for 15 minutes. For these patients, the period when stool was in the bowel, abdominal distension, and fecal incontinence decreased and the frequency of defecation increased. For the current study's control group, there was no significant difference between the fourth day of surgery and discharge, which suggests that the medicine used in for treatment of constipation does not have the same effect abdominal massage has on quality of life.

In the evaluation of general state of health in both groups, the increase from the fourth day until discharge from the hospital is similar to patients who are hospitalized because of orthopedic problems and can be explained by their discharge after their problems or discomfort regarding constipation is resolved.

CONCLUSION

This study shows that abdominal massage decreases the symptoms of constipation compared with medication such as laxatives, suppository, and enema; shortened the period of defecation; and increased the quality of life. When managing constipation, nurses have an important role. For surgical patients experiencing constipation, nurses need to be informed about the application of abdominal massage, one of the nonpharmacological

TABLE 5. Comparison of PAC-QOL and EQ-5D Scores Between Comparison Groups 4 Days After Surgery and at Discharge From the Hospital

	Experimental (n = 30)	Control (n = 30)		
	$\bar{X}$ ± SD	$\bar{X}$ ± SD	MW	p
PAC-QOL				
Physical disturbance (before abdominal massage)	10.70 ± 3.68	9.60 ± 4.90	360	.178
Physical disturbance (at discharge)	7.20 ± 3.14	9.60 ± 3.59	270	.007[a]
	p = .000[b]	p = .999		
Psychosocial disturbance (before abdominal massage)	16.86 ± 6.38	16.60 ± 6.95	432	.784
Psychosocial disturbance (at discharge)	13.33 ± 5.22	15.70 ± 6.15	311	.038[a]
	p = .000[b]	p = .134		
Anxiety (before abdominal massage)	27.00 ± 10.80	24.40 ± 11.61	381	.297
Anxiety (at discharge)	21.56 ± 7.38	24.03 ± 9.47	399	.447
	p = .002[a]	p = .508		
Satisfaction (before abdominal massage)	21.90 ± 3.29	19.96 ± 5.86	398	.431
Satisfaction (at discharge)	21.73 ± 2.82	20.00 ± 3.90	335	.087
	p = .591	p = .968		
PAC-QOL total (before abdominal massage)	76.46 ± 15.53	70.56 ± 21.68	323	.060
PAC-QOL total (at discharge)	63.83 ± 13.99	69.33 ± 16.53	362	.190
	p = .000[b]	p = .891		
EQ-5D				
$EQ\text{-}5D_{SKOR}$ (before abdominal massage)	003 ± 0.28	0.05 ± 0.29	449	.982
$EQ\text{-}5D_{SKOR}$ (at discharge)	0.48 ± 0.27	0.51 ± 0.26	411	.552
	p = .000[b]	p = .000[b]		
EQ_{VAS} (before abdominal massage)	61.50 ± 15.76	59.83 ± 16.73	416	.601
EQ_{VAS} (at discharge)	82.16 ± 10.96	79.96 ± 11.53	379	.283
	p = .000[b]	p = .000[b]		

Note. EQ-5D = EuroQol European Quality of Life Instrument; MW = Mann-Whitney U test; PAC-QOL = Patient Assessment of Constipation Quality of Life.

[a]Correlation is significant at the .05 level (two-tailed).

[b]Correlation is significant at the .01 level (two-tailed).

methods used effectively for nursing treatment of constipation. In-service training programs should be organized to educate nurses about this technique and its use for treating constipation. Patients with a diagnosis of constipation and their families should be encouraged to cooperate with a dietician and physical therapist to create a nutrition and exercise program useful for managing postoperative constipation. We also suggest that different experimental studies including nonpharmacological methods that can ease or

resolve the problem of constipation be conducted to further nursing knowledge about effective management of constipation. ✪

ACKNOWLEDGMENTS

The authors are grateful to the Scientific Research Project Unit at Istanbul University and Associate Professor Nurten Kaya, PhD, BSN, for their contributions (Project No: 9631).

REFERENCES

Albers, B., Cramer, H., Fisher, A., Meissner, A., Schürenberg, A., & Bartholomeyczik, S. (2006). Abdominal massage as intervention for patients with paraplegia caused by spinal cord injury. *Pflege Z*, *59*, 2–8.

Atabek, T. (1994). Osteoporitik kırık nedeniyle yatağa bağımlı yaşlı hastaların yakınmalarının incelenmesi [Examination of complaints because of bedridden older patients with osteoporotic fracture]. *Hemşirelik Bülteni*, *8*(32), 37–44.

Ayaş, S., Leblebici, B., Sözay, S., Bayramoğlu, M., & Niron, E. A. (2006). The effect of abdominal massage on bowel function in patients with spinal cord injury. *American Journal of Physical Medicine Rehabilitation*, *85*(12), 951–955.

Bolol, N., Ülgen, S., Turan, N., Kaya, N., & Kaya, H. (2010). Bir üniversite hastanesinin kulak burun boğaz polikliniğinin hastalar tarafından değerlendirilmesi [Patients' evaluation of an ear-nose-throat polyclinic in a university hospital]. *Hemşirelikte Eğitim ve Araştırma Dergisi*, *7*(3), 26–35.

Brooks, R. (1996). EuroQol: The current state of play. *Health Policy*, *37*(1), 53–72.

Chumpitazi, B. P., Lane, M. M., Czyzewski, D. I., Weidler, E. M., Swank, R. R., & Shulman, R. J. (2010). Creation and initial evaluation of a Stool Form Scale for children. *The Journal of Pediatrics*, *157*(4), 594–597.

Dedeli, Ö., Turan, İ., Fadıloğlu, Ç., & Bor, S. (2007). Konstipasyon Yaşam Kalitesi Ölçeği'nin geçerlik ve güvenirlik çalışması [A validity and reliability of adaptation patient assessment of constipation quality of life scale]. *MN Dahili Tıp Bilimleri*, *2*(1–2), 36–43.

Emly, M., Cooper, S., & Vail, A. (1998). Colonic motility in profoundly disabled people. A comparison of massage and laxative therapy in the management of constipation. *Physiotherapy*, *84*, 178–183.

Emly, M. C. (2007). Abdominal massage for constipation. InLaycock, J. H. J. (Ed.), *Therapeutic management of incontinence and pelvic pain* (2nd ed., pp. 223–225). London: Springer.

Ernst, E. (1999). Abdominal massage therapy for chronic constipation: A systematic review of controlled clinical trials. *Forsch Komplementarmed*, *6*, 149–151.

Glia, A., & Lindberg, G. (1997). Quality of life in patients with different types of functional constipation. *Scandinavian Journal of Gastroenterology*, *32*, 1083–1089.

Harrington, K. L., & Haskvitz, E. M. (2006). Managing a patient's constipation with physical therapy. *Physical Therapy*, *86*, 1511–1519.

Jeon, S., & Jung, H. M. (2005). The effects of abdominal meridian massage on constipation among CVA patients. *Taehan Kanho Hakhow Chi*, *35*(1), 135–142.

Kaçmaz, Z., & Kaşıkçı, M. (2007). Effectiveness of bran supplement in older orthopaedic patients with constipation. *Journal of Clinical Nursing*, *16*, 928–936.

Kanbir, O. (1998). *Klasik Masaj* (pp. 189–193). Bursa: Ekin Kitabevi Yayınları.

Kaya, H. (2011). Bağırsak boşaltımı ve gastrik entübasyon. In Aştı, T. A., & Karadağ, A. (Eds.), *Klinik uygulama becerileri ve yöntemleri* (pp. 1116–1145). Adana: Nobel Kitabevi.

Kaya, H. (2012). Bağırsak boşaltımı. In T. A., Aştı, & A. Karadağ, (Eds.), *Hemşirelik esasları hemşirelik bilimi ve sanatı* (pp. 941–969). İstanbul: Akademi Basın Ve Yayıncılık.

Kaya, H., Kaya, N., Turan, N., Şirin, K., & Güloğlu, S. (2013). Identifying constipation risk in neurosurgery patients. *The Journal of Neurological and Neurosurgical Nursing*, *2*(3), 96–103.

Kaya, N. (2012). Yaşam modeli. In Babadağ, K., & Aştı, T. A. (Eds.), *Hemşirelik esasları uygulama rehberi* (pp. 1–7). İstanbul: İstanbul Medikal Yayıncılık.

Kaya, N., & Turan, N. (2011). Reliability and validity of constipation severity scale. *Turkiye Klinikleri Journal of Medical Sciences*, *31*(6), 1491–1501.

Kyle, G. (2011). Managing constipation in adult patients. *Nurse Prescribing*, *9*(10), 482–490.

Lamas, K., Lindholm, L., Stenlund, H., Engstrom, B., & Jacobsson, C. (2009). Effects of abdominal massage in management of constipation—A randomized controlled trial. *International Journal of Nursing Studies*, *46*, 759–767.

Lamas, K, Lindholm, L., Engstrom, B., & Kaconson, C. (2010). Abdominal massage for people with constipation: A cost utility analysis. *Journal of Advanced Nursing*, *66*(8), 1719–1729.

Lane, M. M., Czyzewski, D. I., Chumpitazi, B. P., & Shulman, R. J. (2011). Reliability and validity of a Modified Bristol Stool Form Scale for children. *The Journal of Pediatrics*, *159*(3), 437–441.

Lewis, S. J., & Heaton, K. W. (1997). Stool form scale as a useful guide to intestinal transit time. *Scandinavian Journal of Gastroenterology*, *32*, 920–924.

Marquis, P, Loge De La, C., & Dubois, D. (2005). Development and validation of the patient assessment of constipation quality of life. *Scandinavian Journal of Gastroenterology*, *40*, 540–551.

McClurg, D., Hagen, S., Hawkins, S., & Lowe-Strong, A. (2011). Abdominal massage for the alleviation of constipation symptoms in people with multiple sclerosis: A randomized controlled feasibility study. *Multiple Sclerosis Journal*, *17*(2), 223–233.

O'Keefe, E. A., Talley, N., Zinsmeister, A. R., & Jacobsen, S. J. (1995). Bowel disorders impair functional status and quality of life in the elderly: a population-based study. *The Journals of Gerontology. Series A, Biological Sciences and Medical Sciences*, *50*(4), 184–189.

Preece, J. (2002). Introducing abdominal massage in palliative care for the relief of constipation. *Complementary Therapies in Nursing & Midwifery*, *8*, 101–105.

Rasmussen, L. S. (2010). Constipation and defecation pattern the first 30 days after thoracic surgery. *Scandinavian Journal of Caring Sciences*, *24*(2), 244–250.

Resedence, T. L., Brocklehurst, J. C., & O'Neil, P. A. (1993). A pilot study on the effect of exercise and abdominal massage on bowel habit in continuing care patients. *Clinical Rehabilitation*, *7*, 204–209.

Revicki, D. A., Wood, M., Wiklund, I., & Crawley, J. (1998). Reliability and validity of the gastrointestinal symptom rating scale

in patients with gastroesophageal reflux disease. *Quality of Life Research*, *7*, 75–83.

Richards, A. (1998). Hands on help. *Nursing Times*, *94*, 69–75.

Şendir, M., Büyükyılmaz, F., Aştı, T., Gürpınar, Ş., & Yazgan, İ. (2012). Postoperative constipation risk assessment in Turkish orthopedic patients. *Gastroenterology Nursing*, *35*(2), 106–113.

Sinclair, M. (2011). The use of abdominal massage to treat chronic constipation. *Journal of Bodywork & Movement Therapies*, *15*(4), 436–446.

Tuna, N. (2011). *A'dan Z'ye Masaj*. (6. Baskı, pp. 17–39). İstanbul, Turkey: Nobel Tıp Kitabevi.

Turan, N., & Asti, T. (2011, March 25–27). *Validity and reliability of Turkish version of the gastrointestinal symptom rating scale*. MedicReS IC2011 International Conference on Good Medical Research, Abstract Book, Istanbul, Turkey.

Turan, N., Kaya, N., Kaya, H., Öztürk, A., Eskimez, Z., & Yalçın, N. (2011). Hemşirelik öğrencilerinin bazı değişkenler açısından konstipasyon sorunları [Constipation problems of nursing students with respect to certain variables]. *İstanbul Üniversitesi Florence Nightingale Hemşirelik Yüksekokulu Dergisi*, *19*(3), 168–178.

Uysal, N., Eşer, İ., & Akpınar, H. (2012). The effect of abdominal massage on gastric residual volume a randomized controlled trial. *Gastroenterology Nursing*, *35*(2), 117–123.

Varma, M. G., Wang, J. Y, Berian, J. R., Patterson, T. R., McCrea, G. L., & Hart, S. L. (2008). The constipation severity instrument: A validated measure. *Diseases of the Colon and Rectum*, *51*(2), 162–172.

Wald, A., Scarpignato, C., Kamm, M. A., Mueller-Lissner, S., Helfrich, I., Schuijt, C., … Petrini, O. (2007). The burden of constipation on quality of life: Results of a multinational survey. *Alimentary Pharmacology & Therapeutics*, *26*(2), 227–236.

Yurdakul, İ. (2004). Konstipasyon. In M. Yurdakul, E. Şentürk, E. Tuncer, & Göksoy (Eds.), *Gastroenterolojide Klinik Yaklaşım* (pp. 121–132). İstanbul: İstanbul Üniversitesi Cerrahpaşa Tıp Fakültesi Sürekli Tıp Eğitimi Etkinlikleri.