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ARAŞTIRMA MAKALESİ

Monitoring Food Images After Rectal Surgery to Accelerate Recovery of Postoperative Bowel Motility: A Quasi-Experimental Study

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Abstract
Objective: Considering the role of nurses in the postoperative care of patients, simple nursing interventions can prevent gastrointestinal motility problems. This study aimed to assess the impact of viewing food images on the recovery of intestinal motility after surgery in patients who were operated for rectal cancer.
Methods: This quasi-experimental study was carried out with 48 patients who underwent rectal surgery in the general surgery clinic of a university hospital in Türkiye from May 2016 to December 2018. The control group had 25 participants and the experimental group had 23. From the first morning after surgery until defecation, patients in the experimental group were asked to monitor food pictures thrice a day, parallel to their meals.
Results: In the experimental group, patients' first flatus (3.30 ± 1.52, day) and defecation time (4.91 ± 1.27, day) were significantly shorter compared with the first flatus (4.28 ± 1.64, day) and defecation time (5.84 ± 1.40, day) of the control group (respectively; $p = 0.037$, $p = 0.027$).
Conclusion: Monitoring food images supports the cephalic phase and could be a nursing intervention to speed up intestinal functions by increasing the release of gastrointestinal hormones and activating the parasympathetic nervous system. To accelerate bowel motility after rectal surgery, displaying the food images to the patients is a very simple intervention with low risk and cost and nurses should use it in the care of the patients who underwent surgery because of rectal cancer. It is recommended that further studies examining the effectiveness of monitoring food images on gastrointestinal surgeries should be performed.

Keywords: Food images, gastrointestinal motility, ileus, nursing, postoperative, rectal surgery

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Rektal Cerrahi Girişim Sonrası İntestinal Motilitenin Arttırılmasında Yiyecekleri İzleme: Bir Yarı-Deneysel Çalışma

Öz

Amaç: Ameliyat sonrası hasta bakımında, hemşirelerin rolü düşünüldüğünde, basit hemşirelik girişimleri gastrointestinal motilite problemlerini önleyebilir. Bu çalışma, rektum kanseri nedeniyle ameliyat edilen hastalarda, yiyecek görsellerini izlemenin ameliyat sonrası bağırsak hareketliliğinin iyileşmesi üzerine etkisini değerlendirmeyi amaçlamaktadır.

Yöntem: Bu yarı deneysel çalışma, Marmara Bölgesinde, bir üniversite hastanesinin genel cerrahi kliniğinde rektum kanser cerrahisi uygulanan 48 hasta ile, Mayıs 2016-Aralık 2018 tarihleri arasında yapıldı. Kontrol grubu 25, deney grubu 23 hastadan oluştu. Deney grubundaki hastalara, ameliyat sonrası ilk sabahtan itibaren dışkılamaya kadar olan süre aralığında, öğün saatlerine paralel, günde üç kez yiyecek resimleri izletildi.

Bulgular: Deney grubunda hastaların ilk gaz çıkışı (3.30 ± 1.52, gün) ve dışkılama süresi (4.91 ± 1.27, gün) kontrol grubundaki hastaların ilk gaz çıkışı (4.28 ± 1.64, gün) ve dışkılama süresiyle (5.84 ± 1.40, gün) karşılaştırıldığında anlamlı olarak daha kısaydı (Sırasıyla; $p = 0.037$, $p = 0.027$).

Sonuç: Sefalik fazı uyaran yiyecek görüntülerinin izlenmesi, gastrointestinal hormonların salınımını artırarak ve parasempatik sinir sistemini aktive ederek intestinal fonksiyonların hızlandırılması amacıyla uygulanacak bir hemşirelik girişimi olabilir.

Rektum cerrahisi sonrası intestinal motiliteyi hızlandırmak için hastalara yiyecek görüntülerinin gösterilmesi, riski ve maliyeti düşük olan çok basit bir girişimdir ve hemşireler bunu rektum kanseri nedeniyle ameliyat olan hastaların bakımında kullanmalıdır. Gastrointestinal cerrahide yiyecek görüntüleri izletilmesinin etkinliğini inceleyen farklı bilimsel çalışmalar yürütülmesini önermekteyiz.

Anahtar Kelimeler: Ameliyat sonrası dönem, gastrointestinal motilite, hemşirelik, ileus, rektum cerrahisi, yiyecek resimleri

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INTRODUCTION

Among the cancers diagnosed in the world, colorectal cancer (CRC) is in the top three for men and women (1). Time to return to gastrointestinal (GI) functions is one of the important factors that cause prolonged hospital stays after surgical procedures applied for CRC treatment (2). Delays in the recovery of GI functions are because of the combination of many variables, such as increased sympathetic activity, inflammatory bowel reactions, and surgical trauma (3). Ileus, which is a major postoperative complication and a result of this delay's extension causes problems that disrupt the healing process, such as nausea, vomiting, and pain related to the inability to expel gas, feces, and distension of the intestines (2,3). Considering the potential problems that patients undergoing CRC surgery may experience, the importance of nursing care that nurses will apply to recognize, prevent, and eliminate postoperative GI problems becomes apparent.

To reduce postoperative gastrointestinal problems, patient care should focus on digestive physiology and help increase gastrointestinal motility. Supporting the

cephalic stage, which is the first stage of digestion and includes physiological reactions to food cues such as the thought, smell, appearance, and taste of food, may help improve postoperative gastrointestinal motility (4,5). In the cephalic phase responses that occur when we taste, smell, see and chew our food, the increase of muscle contractions and secretions that occur in the digestive tract by triggering the receptors and fibers in the GI system also increase intestinal motility (4,6,7,8). It is mentioned also in the literature that images that evoke positive emotions can affect stomach motility (9,10).

Stimulation of the cephalic phase of digestion may ensure bowel motility, which is a crucial issue in the postoperative period after colorectal surgery (11). In the improvement of GI functions after colorectal surgery, many noninvasive methods are applied within the scope of Enhanced Recovery Programs (2). Chewing gum, one of these methods has minimal risk and low cost and stimulates postoperative GI recovery through activation of the cephalic-vagal reflex (1,2). However, it may not be possible for every patient to chew gum after surgery due to oral and dental health problems and potential complications such as aspiration. It is also emphasized in the literature that harmful wastes may occur because of chewing gum (12).

Considering the role of nurses in the postoperative care of patients operated on for CRC, simple nursing interventions that can stimulate the cephalic-vagal reflex can prevent postoperative GI motility problems. In the literature, studies report that the release of ghrelin starts with the appearance of food, the cephalic-vagal reflex is activated, and the GI motility increases (9,10,13). However, it is noteworthy that while these studies focus on GI motility physiology, no studies are examining the effect of using food pictures on postoperative GI function recovery in patients who underwent CRC surgery. It is thought that it may be a simple, cheap, and safe procedure to show food pictures to patients in nursing care, which will be applied to shorten the duration of gas and stool removal and to accelerate the recovery process after CRC procedures. The aim of this study, which will also contribute to the nursing literature, is to assess the impact of viewing food images on the recovery of intestinal motility after surgery in patients who were operated for rectal cancer.

Research hypothesis

H1: Viewing food images after rectal surgery affects the time of first flatulence after surgery.

H2: Viewing food images after rectal surgery affects the time of first defecation after surgery.

MATERIAL AND METHODS

Design and Sample

This is a quasi-experimental study. We carried out with 48 patients who underwent rectal surgery because of colorectal cancer in the general surgery clinic of a university hospital in the Marmara region of Türkiye from May 2016 to December 2018.

In this study, we used a convenience sample method. Patients, who met the criteria for sampling and agreed to participate in the research were involved in the study. Forty-eight patients who met the study criteria formed the sample of the study. We distributed patients between the experimental group (n = 23) and the control group (n = 25). Twenty-three patients who accepted monitoring to food pictures were included in the experimental group, and it included 25 patients who did not accept monitoring to food pictures were in the control group. A flow diagram was prepared based on the TREND checklist (14) and Figure 1 shows the flow diagram of the study.

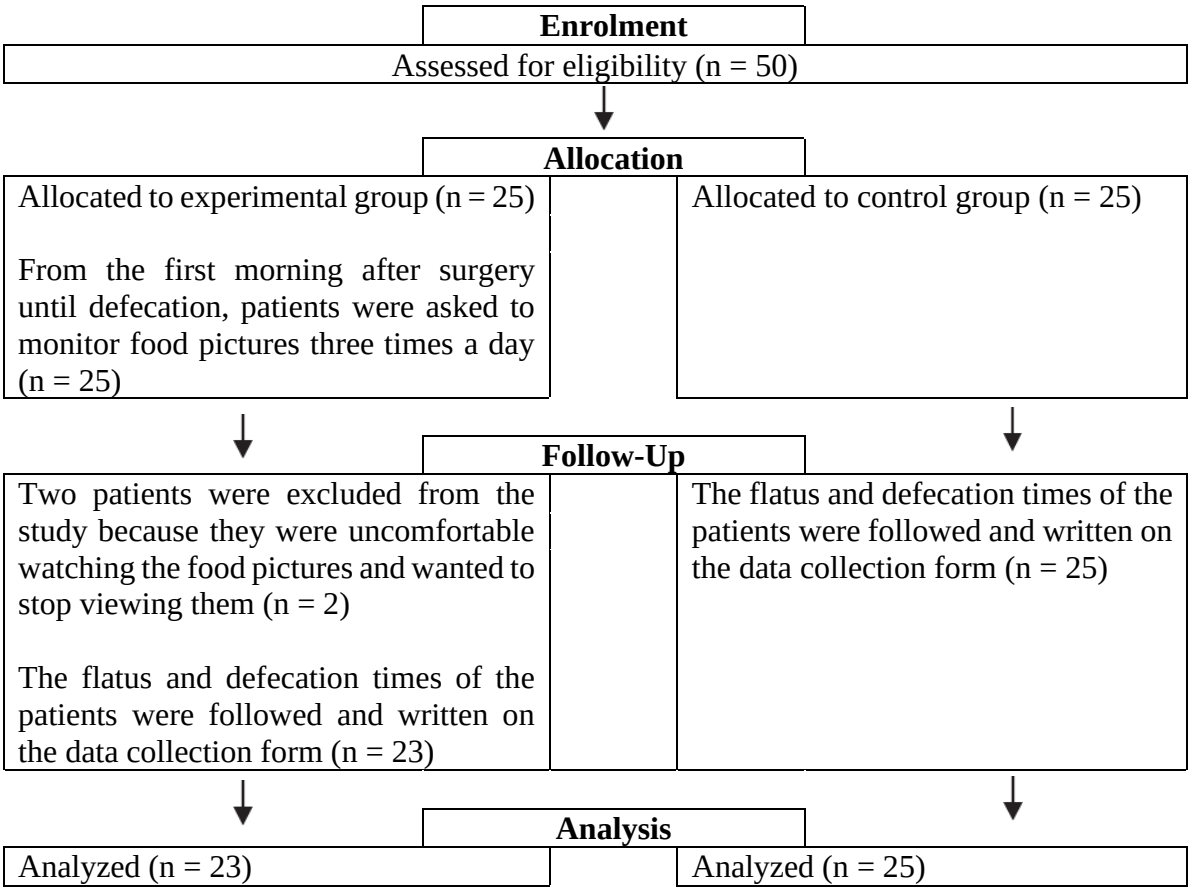

Figure 1. Flow diagram of the study

Patients aged over 18 years who underwent open rectal surgery due to colorectal cancer, did not receive epidural anesthesia or analgesia in the intraoperative or postoperative period, had no nasogastric catheter, were mobilized within 24 hours during the post-operative period and whose surgery was performed by the same surgeon were included in the sample. Patients were excluded who had complications developed during or after surgery and need treatment in the intensive care unit after surgery.

Calculation of Sample Size

The power analysis was performed to calculate sample size by using the G*Power (3.1.9.4). As a result of the power analysis applied with the mean and standard deviations in the study results of Schüssler et al. (13), it was found that each group should comprise at least 21 patients (42 patients in total) at 1.17 effect size, 96% power and alpha 0.05. It increased the sample size by 20% in order to avoid potential sample loss. As a result, 50 patients, including 25 patients in each group, were assigned to the study. Two patients who were in the experimental group were excluded from the sample because they resisted watching food pictures during the data collection process. Consequently, the study was conducted with 48 patients.

Ethical Considerations

The Research Ethics Committee of the Institutional Review Board reviewed and approved this study (Trakya University Faculty of Medicine Scientific Research Ethics Committee, decision no 07/16, Date: 07.04.2016). Also, the management of the hospital and clinic where the study was conducted approved the study by giving written permission. Prior to the study, information was given to the patients about the purpose and method of the study and their written consent was obtained. We explained that if the patients wanted to leave the study, they could leave the study providing none reason.

Data Collection and Instruments

In data collection, the "Data Collection Form" created by the researchers following the literature was used (7,9,10,15,16,17). Demographic details such as age, gender, educational level and the health histories of the patients such as neoadjuvant chemotherapy-radiotherapy, operation time, potassium level, first flatus and defecation times were investigated with the data collection form comprising 10 questions.

Intervention

A booklet with colorful food pictures was prepared to be given to the patients in the experimental group. The pictures in the

booklet included pictures of foods suitable for daily meals such as soup, cooked meat, cooked/raw vegetables and fruits, rice, pasta, salad, and dessert, as well as pictures of drinks. The researchers performed the clinical daily visits to determine the patients who met the sampling criteria and were to undergo planned rectal surgery. And then, information about the aim and application of the study was given to the patients, and patients who volunteered to participate in the study were included in the study. It included patients who volunteered to monitor food pictures in the experimental group, and it included the patients who reported that they did not want to monitor food pictures in the control group.

Before starting data collection, the researchers informed the patients about the purpose, content, and method of the study. After obtaining consent from the patients to participate in the study, the first flatus and defecation times to be followed in the postoperative period and other data to be collected were explained to the patients. A booklet with pictures of food was given to the patients in the experimental group. The patients were told that they should look at the pictures in the booklet at mealtimes three times a day until the first defecation time in the postoperative period.

Patients in each group received the routine postoperative care applied in the clinic. From the first morning after surgery until defecation, patients in the experimental group were asked to monitor food pictures three times a day, parallel to their meals. The flatus and defecation times of the patients were followed and written on the data collection form.

Data Analysis

In the statistical analyses, which were performed for data assessment, by IBM SPSS (Statistical Package for the Social Science; Armonk, NY: IBM Corp.) 23 program, the percentage, frequency, and average analyses as well as the Mann-Whitney U test, and Chi-square test were used. The evaluation of the results was made at a 95% confidence interval. Significance was accepted at the $p < 0.05$ level.

RESULTS

It was found in this study that the mean age of the patients was 67.43 ± 8.39 and 64.6% of them were male. In the process until the surgery, 33.3% of the patients experienced chemotherapy and 39.6% of them experienced radiotherapy. The average operation time was 213.04 ± 74.94 minutes, and the average postoperative potassium (K) level was 3.68 ± 0.26 (Table 1).

In the experimental group, patients' first flatus (3.30 ± 1.52) and defecation time (4.91 ± 1.27) were significantly shorter compared with the first flatus (4.28 ± 1.64)

and defecation time (5.84 ± 1.40) of the control group (respectively; p= 0.037, p= 0.027), (Table 2). In terms of variables, there were no other significant differences between groups.

Table 1: Patients' Characteristics (n = 48)

Characteristics		**Total (*n* = 48)**		**Experimental group (*n* = 23)**		**Control Group (*n* = 25)**			
		n	**%**	***n***	**%**	***n***	**%**	***X²***	***p***
Gender	**Female**	17	35.4	8	34.8	9	36.0	0.008	0.930
	Male	31	64.6	15	65.2	16	64.0		
Chemotherapy before surgery	**Yes**	16	33.3	7	30.4	9	36.0	0.167	0.683
	No	32	66.7	16	69.6	16	64.0		
Radiotherapy before surgery	**Yes**	19	39.6	8	34.8	11	44.0	0.426	0.514
	No	29	60.4	15	65.2	14	56.0		
		Mean ± SD	**Min-Max**	**Mean ± SD**	**Min-Max**	**Mean ± SD**	**Min-Max**	***Z***	***p***
Age		67.43 ± 8.39	48-85	69.13 ± 8.19	48-85	65.88 ± 8.43	50-83	-1.571	0.116
Operation time (minutes)		213.04 ± 74.94	90.0-480.0	225.22 ± 79.23	90-480	201.87 ± 70.07	90-420	-1.156	0.248
Postoperative Potassium (K)		3.68 ± 0.26	3.27-4.20	3.80 ± 0.30	3.46-4.20	3.58 ± 0.20	3.27-3.90	-1.006	0.314

X^2 = Chi-Square Test, Z = Mann-Whitney U Test

Table 2: Outcomes of Patients' Postoperative Bowel Motility

	Total (*n* = 48)	**Experimental group (*n* = 23)**	**Control group (*n* = 25)**		
	Mean ± SD	**Mean ± SD**	**Mean ± SD**	***Z***	***p***
First flatus time (day)	3.81 ± 1.64	3.30 ± 1.52	4.28 ± 1.64	-2.091	**0.037**
First defecation time (day)	5.39 ± 1.41	4.91 ± 1.27	5.84 ± 1.40	-2.213	**0.027**

Z = Mann-Whitney U Test

DISCUSSION

In this study, the effect of food pictures shown to patients who underwent surgery for rectal cancer on postoperative bowel motility was investigated. The results obtained from the study suggested that watching food images in patients undergoing rectal surgery helps initiation of intestinal motility after surgery.

Supporting the cephalic phase can accelerate bowel function by increasing the release of GI hormones and activating the parasympathetic nervous system (15). It is stated that watching food pictures encodes the digestive-promoting value of food cues in the brain (16,18). Schienle et al. (19) reported that areas of the brain related to digestion were stimulated by showing pictures of pleasant meals. Similarly,

Simmons et al. (20) stated that the thought of food stimulates regions of the brain that affect taste, taste reward, and the shape of food. The results of the studies suggest that patients' viewing of food images activates areas in the brain that stimulate digestive activities by recognizing and predicting food.

It is stated that the postoperative motility of the digestive system can be changed by increasing the cephalic phase of digestion by using the taste, smell, and appearance of the food (15). Morquecho-Campos et al. (21) stated that the cephalic-phase responses increased with sensory stimulations including odor and vision of food and mastication. In the literature, it is also emphasized that pleasant pictures with food increase the gastric motility of healthy individuals (9,10). Consequently, perception of food and stimulation of the senses that will activate the cephalic phase of digestion in patients undergoing rectal surgery may be beneficial in terms of increasing gastric motility.

Stimulation of gastrointestinal motility and prevention of ileus after surgery is one of the main goals of accelerating recovery after surgical protocol and nursing care interventions (17). For this reason, there are various nursing studies in the literature to determine the effect of cephalic phase stimulation on postoperative bowel motility. Chuamor and Thongdonjuy (22) found that chewing gum which stimulating cephalic phase, accelerated intestinal functions in their randomized controlled study with gynecological patients undergoing abdominal surgery. Mahmoud and Mohammad (23) determined that postoperative ileus developed more in patients who did not chew sugarless gum after appendectomy compared to patients who did not chew. In these studies, chewing gum was chosen as a nursing intervention to stimulate the cephalic phase of digestion and accelerate intestinal motility. Given the findings of the available studies, as a simple and cost-effective method, the use of food visualizations may be preferable as a nursing intervention to assist in the faster return of gastrointestinal motility after surgery.

Limitations

This study has some limitations. The fact that the study was conducted in a single center and included patients who underwent surgical intervention by a particular surgeon limits the generalizability of the results of the study. Also, randomization could not be performed due to the inclusion of rectal cancer patients operated on by the same surgeon and also due to the prediction that there would be difficulties in matching the groups in terms of characteristics such as age, gender, and preoperative stage of the disease due to the limited number of

patients operated on for rectal cancer in the clinic where the study was conducted. Since both the limited number of patients and the inclusion of patients operated by the same surgeon limited the number of patients to be included in the study, the inclusion criteria such as preoperative defecation habits, comorbidities, medications used, postoperative treatment regimen, time of starting oral intake and preoperative fasting period could not be further restricted. This was an important limitation of the study. Difficulties in monitoring the amount of fluids given to patients in the perioperative period and intraoperative bleeding were also additional limitations of the study. Another important limitation of the study is that the perioperative treatment regimens and anesthesia practices of the patients could not be standardized due to the small number of patients that could be sampled.

CONCLUSIONS

In order to help accelerate bowel motility after rectal surgery, showing food images to patients, which is a very simple, low-risk, and low-cost intervention, can be considered a promising intervention and can be used by nurses in the care of patients who underwent surgery due to rectal cancer. There is a need for high-quality and multi-center original experimental studies with a large sample standardized in terms of factors affecting motility, examining the effectiveness of viewing food images on the improvement of intestinal motility in the colon and other gastrointestinal surgeries that involve the risk of delay in bowel movements.

Ethical Approval: This study was approved by Trakya University Faculty of Medicine Scientific Research Ethics Committee (TÜTF-BAEK 2016/94, decision no. 07/16, Date: 07/04/2016). The research conforms to the provisions of the Declaration of Helsinki (as revised in Brazil 2013). The management of the hospital and clinic where the study was conducted approved the study by giving written permission. Prior to the study, information was given to the patients about the purpose and method of the study and their consent was obtained. We explained that if the patients wanted to leave the study, they could leave the study providing no reason.

Authors Contributions: All authors were responsible for the conception and study design. D.A. and S.Y.T were involved in participant selection and performed the data collection. S.Y.T. contributed to the analysis of the data. S.Y.T. and D.S.Y. wrote the manuscript. All the authors critically revised the manuscript, discussed the results, and commented on the manuscript and approved of the final version to be published.

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