



Effect of abdominal massage on constipation and quality of life in older adults: A randomized controlled trial



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ABSTRACT

Background and study aim: This study aimed to examine the effects of abdominal massage on constipation management and quality of life.

Material and methods: In this study conducted in a nursing home, 220 older adults (over 65 years old) were identified with constipation based on the Rome II Diagnostic Criteria for Constipation. This controlled trial using blocked randomization was stratified by sex and age and was conducted with 35 elderly participants, of which 17 formed the experimental group and were applied abdominal massage and 18 formed the untrained control group. The experimental group underwent abdominal massage training for eight weeks, five days, for 30 min/day after the meal under a research team member. The control group received no intervention. Data were collected from both groups by using a personal information form, the Constipation Quality of Life Scale. After the practice, each group was re-subjected to the same scales.

Results: Our results showed that abdominal massage is effective in constipation management ($p < 0.005$). Moreover, the difference between the experimental and control groups was statistically significant ($p < 0.001$) in terms of Constipation Quality of Life Scale post-test scores.

Constipation Quality of Life Scale subscales of the experiment and control group; the difference between the post-test scores of Physical Disability ($p < 0.001$), Psychosocial Discomfort ($p < 0.001$), Anxiety ($p < 0.001$) and Satisfaction ($p < 0.001$) was found statistically significant.

Conclusion: Abdominal massage, as one of the independent nursing initiatives, may be suggested to be used in constipation management.

1. Introduction

Constipation is one of the important health concerns in older adults.¹ It is defined by difficulty in stooling, the passage of hard stool, inadequate draining, or fewer than three bowel movements per week. It is one of the most common complaints of the digestive system in older adults; the overall prevalence ranges from 2% to 27%. With increasing age, the prevalence of constipation significantly increases by approximately 50%. It is suggested that this frequency may reach up to 74% among nursing home residents and is two- to three-times more common in women than in men.² A literature review reported that the prevalence of constipation is 20% and that 73% of these individuals are women aged > 60 years.³ According to a study conducted by Komiya et al., 56.9% of older residents in nursing homes exhibited risk factors for constipation.⁴

Constipation can cause back and waist pain, rectal pressure, loss of

appetite, incontinence, nausea and vomiting, urinary dysfunction, fissure, rectal prolapse, hemorrhoids, intestinal obstruction, and syncope.⁵

Constipation can be managed using pharmacological methods, such as laxatives (bulking agents and suppositories), along with non-pharmacological procedures, such as enemas, dietary change, and exercise. Although these applications are effective for short-term use, they can result in problems in the long term. Therefore, it is important to choose the appropriate method to minimize the inconvenience of constipation.

Constipation has a significant unfavorable effect on the quality of life of older adults; this effect can be alleviated via planned nursing interventions. Abdominal massage, one of the nonpharmacological methods, reduces complaints about bowel movements.⁶ Abdominal massage is a non-invasive method that is easily applicable without side effects.^{7–10} To treat constipation and prevent its re-emergence, abdominal massage should be included in the nursing care process.^{9,11}

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Moreover, aerobic exercise and other lifestyle changes that motivate elderly individuals to participate in physical activity via planned education should be implemented. Although several studies have examined the effect of abdominal massage on constipation, studies that investigated its impact on older adults and their quality of life are scarce. To the best of our knowledge, there have been no previous studies regarding the effect of abdominal massage on constipation and quality of life in older adults residing in nursing homes in Turkey. Therefore, it is critical to conduct additional research in this area to improve geriatric nursing knowledge. Accordingly, our study aimed to investigate the effect of abdominal massage, applied to older adults, on constipation and their quality of life.

The following research questions were investigated:

- 1) Is abdominal massage effective for alleviating constipation issues in elderly individuals?
- 2) Does abdominal massage improve the quality of life of the elderly individuals receiving it?

2. Material and method

2.1. Study design and sample selection

This research was based on a randomized control group pre-test–post-test design. The study sample was drawn from a population of 220 older adults living in a nursing home in Ankara, Turkey. Using PASS power analysis software program, to achieve a power of 95% with a margin of error of 0.05, the target sample size was determined to be 35 individuals using power analysis and sample size software. Only 41 elderly people met our inclusion and exclusion criteria. Also, 3 of them did not want to participate in our study. Two older persons died (One of them died of a heart attack, and the other died of a traffic accident), one older person could not participate post-test in the control group. Considering the likelihood of attrition and participants lost to follow-up, a total of 35 older persons were included in the study sample. A blocked randomization method was used to stratify participants with respect to age (65–74 years and ≥ 75 years) and sex (male-female) by the draw lots method.¹²

All study procedures were conducted over five months between March and August of 2015.

The inclusion criteria of our study are as follows; 24 points and over on the Mini-Mental Status Examination, no used any pharmacological and nonpharmacological agents involving laxatives, diagnosed constipation according to Rome II Diagnostic Criteria for Constipation, no any abdominal problems, no acute abdominal symptoms, no intra-abdominal infection, and no disability/limitation and disease. The exclusion criteria of our study are as follows; any previous abdominal pelvic cancer, prostate problems, abdominal hernia, known intestinal cancer, and recently undergone abdominal surgery. Flowchart of the experimental and control group of the study was shown in Fig. 1.

2.2. Instruments

Instruments used in this study were as follows:

2.2.1. Personal information form

The form was prepared by the researchers according to the relevant literature.^{2,5} This form contains 25 closed-ended questions about demographic information, health status, nutrition, and discharge habits of older adults. The surveys were completed with the assistance of researchers.

2.2.2. Rome II diagnostic criteria for constipation

It is a 10-question form that includes questions like stigma, hard or lumpy stool, feeling of incomplete evacuation, feeling of anorectal obstruction, the necessity of defecation by the help of hand, less than three

stools per week to diagnose constipation.¹³

According to the criteria of Rome II constipation diagnosis, although not yet certain in the last 12 months but at least 3 months, the individual is considered to have constipation if two or more of the present cases defecation less than 3 times a week, strain in more than 25% of defecation, mass or hard stool in more than 25% of defecation, sensation of incomplete discharge in more than 25% of defecation, feeling of anorectal atresia/ blocking more than 25%, manual maneuvers to facilitate > 25% of bowel movements.¹³

2.2.3. Constipation quality of life scale (CQLS)

CQLS is the most specific tool for measuring the quality of life of patients with constipation. The Cronbach's alpha coefficient of the scale was found to be 0.91, test-retest reliability $r = 0.96$ $p < 0.001$. The scale is a self-assessment scale consisting of 28 items and "anxiety/distress" (11 items), "physical discomfort" (4 items), "psychosocial discomfort" (8 items), and "satisfaction" (5 items). The item scores of the scale, which is a five-point Likert type range from 1 to 5. The highest score that can be taken from the scale is 140; the lowest score is 28. It is thought that quality of life is negatively affected as the scores obtained from the scale increase. There should not be any unanswered questions to enable coding.¹⁴

2.3. Procedure

2.3.1. Experimental and control groups

Using the stratified randomization method (randomization was performed using computer generation with names in sealed envelopes), the participants were classified according to their age (65–74 years and ≥ 75 years) and sex (male/female), and were assigned to experimental ($n = 17$) and control groups ($n = 18$). A total of 35 participants were included in the study. Afterward, face-to-face interviews were conducted with older adults, and the descriptive characteristics information form and CQLS were applied (pre-test). After attempting the introductory information form, Rome II Diagnostic Criteria for Constipation and CQLS forms were filled, and the abdominal massage was started to be applied to the experimental group that the surveys were completed with the assistance of researcher.

2.3.2. Implementation steps for the experimental group

Before implementing the procedure in the experimental group, information about what an abdominal massage is, how long it will take, and how it will be applied was provided to the participants. The older adult participants in the experimental group were applied massage through gentle movements with slight pressure for 15 min a day, five days a week for eight weeks.¹⁵ Massage application time was between 10.00 and 16.00 h and 30 min after the meal. The massage was performed in the individual's room or suitable room in the institution by the researcher.

Massage Steps;

- When the older adult was in the supine position, a thin cushion was placed beneath the knees to loosen the abdomen and provide slight flexion in the lower extremities.
- Participants were told to breathe normally and relax the abdominal areas as much as possible.
- To warn the tactile senses in the abdomen, the abdominal region with systematic movements massage for about 15 min.¹⁵
- Then, in the direction of the column, horizontal column, and descending column, massage was applied in order to increase the contractions in the intestines by the deep effleurage method.
- With the petrissage (kneading) method, massages were applied with palms and fingers, upward pressure on the ascending colon, downward pressure on the descending colon was continued to be applied.
- Later, the massage was continued by vibration (vibration) method in order to stimulate the nervous system and to relax the muscles

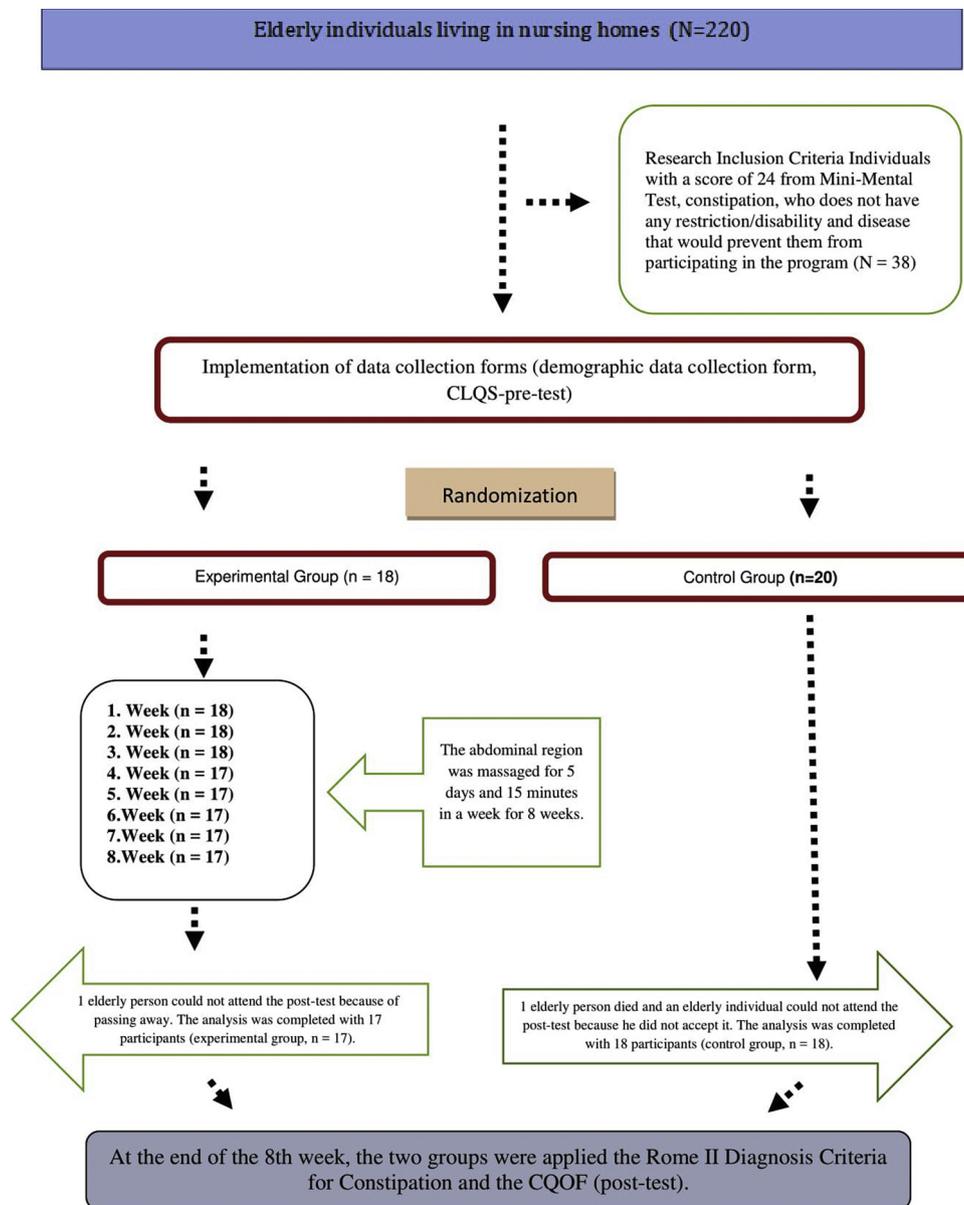


Fig. 1. Flowchart of the experimental and control group of the study.

because the vibration is considered a highly effective maneuver in reducing bowel spasms.¹⁶

In the 8-week massage program, one older adult died, and the experimental group was completed with 17 people. At the end of 8 weeks, the Rome II Diagnostic Criteria for Constipation and CQLS scale were reapplied to the experimental group which was applied abdominal massage (post-test).

The application of abdominal massage was shown in Fig. 2.¹⁶

2.3.3. Implementation steps for the control group

Individuals in the control group did not receive any type of massage application and were evaluated simultaneously with the Rome II diagnostic criteria of constipation and the CQLS experimental group was used for data collection (pre-test/post-test). One elder individual in the control group was excluded from the study because of not accepting the post-test, one older adult died, and a total of 18 subjects from the control group completed the data and included in the analysis.

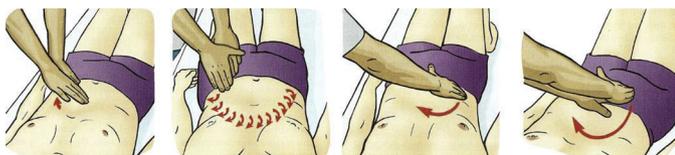


Fig. 2. Application of abdominal massage¹⁶.

Table 1
Distribution of the Defining Characteristics and Some Characteristics Related to The Health Status of the Elderly Individuals.

Characteristics	Experimental Group		Control Group	
	n	%	n	%
Sex				
Female	10	58.8	9	50.0
Male	7	41.2	9	50.0
Age (Mage80.6 ± 6.8) (Mage78.2 ± 6.3)				
65-74	3	17.6	5	27.8
75 and over	14	82.4	13	72.2
BMI ($\bar{X} \pm SS$)	27.80 ± 5.16		25.41 ± 3.70	
Educational status				
Illiterate	11	64.8	7	38.9
8 years	3	17.6	5	27.8
9 years and over	3	17.6	6	33.3
Marital status				
Single	13	76.5	3	16.7
Married	4	23.5	15	83.3
Duration of stay in the nursing home				
5 years and less	11	64.7	12	66.7
6 years and more	6	35.3	6	33.3
Disease requiring continuous follow up				
No	1	5.9	4	22.2
Yes	16	94.1	14	77.8
Regular drug use status				
1-3 piece	6	35.3	7	38.9
4 piece and over	11	64.7	11	61.1
Urinary incontinence				
No	6	35.3	6	33.3
Yes	11	64.7	12	66.7

Table 2
Experimental and Control Group Post-Test Constipation Status.

Constipation status	Experimental (n = 17)		Control (n = 18)		p
	n	%	n	%	
Yes	9	52.9	18	100.0	t = 3.884
No	8	47.1	0	0	p < .001

2.4. Data analysis

Statistical Package for Social Sciences (SPSS) 20.0 package program was used for statistical analyses. Our data showed normal distribution, and besides descriptive statistics, independent sample t-test was performed to analyze the differences between the experimental and control groups in CQLS scores. Cohen's d formula was used to calculate the effect size of the difference between the two group averages. As a result of calculations: .20 refers to small effect size; .50 refers to medium; .80 refers to big effect.¹⁷

In the evaluation of the data, the analysis of the data was carried out by an independent statistical expert to prevent bias.

2.5. Ethical considerations

Written consent was obtained from by the Institutional Ethics

Table 3
Mean Scores of the Post-Test Scale of The Experimental and Control Group.

	Experimental (n = 17) X ± SS	Control (n = 18) X ± SS	p.	Cohen d
Physical discomfort	7.71 ± 1.45	13.39 ± 2.09	.001	-3.14
Psychosocial Discomfort	11.53 ± 2.55	18.28 ± 2.49	.001	-2.68
Anxiety/ Distress	17.12 ± 4.64	43.22 ± 2.10	.001	-7.32
Satisfaction	10.18 ± 1.63	22.94 ± 1.59	.001	-7.93
CQLS	56.29 ± 4.34	81.17 ± 5.16	.001	-5.20

Committee of the university (no: 09.02.2015-73) and the Ministry of Family and Social Policies (no: 73595336-605.01-5563). This study was carried out in accordance with the principles of the Helsinki Declaration. The participants in experiment and control groups were informed following theirs before the beginning of abdominal massage about the purpose of research and the duration.

3. Results

The majority of older adults in the experimental and control groups were aged ≥75 years [14 (82.4%) and 13 (72.2%), respectively], with a mean the Body Mass Index of 27.80 ± 5.16 and 25.41 ± 3.70, respectively. Approximately % of the individuals in both groups were females in the experimental and control group [10 (58.8%) and 9 (50%), respectively] and illiterate in the experimental and control group (64.8% and 38.9%, respectively). In both groups, the majority have been living in a rest home for five years or less [11 (64.7%) and 12 (66.7%), respectively]. Most older adults in both the experimental (16.94.1%) and control (14.77.8%) groups had at least one health problem. The majority of participants were taking four or more medications: 11 (64.7%) and 11 (61.1%) in the experimental and control groups, respectively. Moreover, most participants had incontinence issues, with 11 (64.7%) and 12 (66.7%) in the experimental and control groups, respectively (Table 1).

Based on the pre-test CQLS and subdimensions of the experimental and control groups, there was no statistically significant difference between the two groups in terms of physical discomfort, psychosocial distress, anxiety/distress, and satisfaction scores (p > 0.005). According to the post-test constipation status of individuals in the experimental and control groups, the constipation status of the experimental group decreased, with a significant difference between the groups (p < 0.005) (Table 2). Moreover, a significant difference was found between the post-test scores of the CQLS of the individuals in the experimental and control groups in favor of the experimental group (t(33) = -15.385; p < 0.001). This difference had an extremely large effect value (Cohen's d = -5.20).

In the subdimensions of the CQLS's last test of the individuals in the experimental and control groups, the results were significant in favor of the experimental group: Physical Discomfort (t(33) = -9.29; p < 0.001), Psychosocial Discomfort (t(33) = -7.91, p < 0.001), Anxiety/Distress (t(22.036) = -21.24; p < 0.001), and Satisfaction (t(33) = -23.46; p < 0.001). This difference was significantly higher in Physical Disorder (Cohen's d = -3.14), Psychosocial Disorder (Cohen's d = -2.68), Anxiety/Distress (Cohen's d = -7.32), and Satisfaction (Cohen's d = -7.93) (Table 3).

4. Discussion

Constipation, which is one of the common health concerns in older adults, negatively affects both physical and psychosocial well-being. Studies show that constipation increases with age and the prevalence in older adults vary between 11% and 74%.¹⁸⁻²⁰ A study conducted in Finland found that chronic constipation was observed in 57% of women and 64% of men aged between 65 and 84 years, and this rate increased to 79% and 81%, respectively, in older adults living in nursing homes.²¹ According to the study by Komiya et al., it was determined that risk

factors for constipation existed in most of the older adults living in nursing homes.⁴ According to the study performed by Saga et al., the older adult living in the nursing home experienced strain during continuous defecation and not feeling fully discharged afterward.²² According to the study of Komiya et al., it was determined that risk factors for constipation existed in most of the older adult living in nursing homes.⁴ Moreover, according to a study by Rey et al., if constipation is not controlled, it becomes the most significant risk factor leading to fecal impaction, which has a prevalence of approximately 50% in older adults.²³ In addition to the serious health issues caused by constipation, it increases the cost of healthcare due to hospitalization as well as has a negative impact on the quality of life of older adults.^{13,24,25} Therefore, the early determination of constipation observed in older adults, establishment of appropriate bowel management programs, and planning personalized nursing approaches for intestinal elimination is crucial for the health and comfort of older adults.

Different methods are currently being attempted for the management of constipation, one of which is abdominal massage.²⁶ Abdominal massage accelerates peristalsis by changing the intra-abdominal pressure, thereby mechanically and reflexively acting on the intestines to evacuate the intestine.¹⁷ This method is a nonpharmacological application that is safe, non-invasive, and devoid of side effects; it is accepted for the treatment of constipation and can be administered by nurses to both healthy and sick individuals.⁸ In a study conducted by McClurg et al., it was shown that constipation complaints decreased and bowel movements increased in individuals who received abdominal massage.¹⁰ Similarly, in another study by McClurg et al., once-daily abdominal massage for 6 weeks effectively improved bowel movements.²⁶ In a study by Harrington and Haskvitz, an 85-year-old female patient with severe chronic constipation who was non-responsive to experimental laxative treatment received abdominal massage therapy for 10 min daily for 13 weeks, and by the end of the experimental period, the patient exhibited normal bowel movement frequency and bowel function without any strain or finger help.²⁷ According to a study conducted by Lakhan et al., combining massage and aromatherapy resulted in positive effects.²⁸ Massage is a means of reducing muscle tension, providing relief, and stimulating blood circulation in tissues as well as enhancing the effect of any essential oil used during the massage.²⁹ Other studies on abdominal massage, wherein patients were randomly divided into treatment and control groups, showed that the frequency of defecation was significantly increased in the treatment group.^{30,31} Consistent with the evidence from the literature, in the present study, we found that abdominal massage is an effective solution for constipation issues.

Moreover, evidence suggests that abdominal massage significantly increases individuals' health-related quality of life due to the alleviation of constipation issues.^{10,32} In a study conducted by Wang et al. (2012) on two different groups of healthy individuals and individuals with constipation, the quality of life of those with constipation was lower than that of healthy individuals.¹⁸

Based on the studies regarding abdominal massage, it has been determined that this technique can significantly reduce gastrointestinal symptoms associated with constipation and abdominal pain, increase bowel movements, and significantly increase health-related quality of life.¹⁰ Friedenberget al. investigated black individuals with functional constipation and observed that their health-related quality of life was significantly decreased compared with healthy individuals.³³ In a study conducted by De Giorgio et al., who used CQOL, when the total scale score and sub-dimension score averages were evaluated, the quality of life of individuals with constipation issues was lower in comparison with healthy individuals.³⁴ Munch et al. (2016) stated that the daily life of these individuals is more negatively affected.²⁴ Lai et al. (2011) found that scented abdominal massage in patients with constipation improved their quality of life in the physical sub-dimension and 100 normal abdominal massages improved the psychosocial sub-dimension of the patients.³⁵

In the present study, it was observed that the CQOL scores of older adults in the experimental group who received abdominal massage decreased and therefore their quality of life increased; the difference between the pretest and post-test scores was significant. The study findings are consistent with the literature and suggest that abdominal massage applied to older adults may facilitate the evacuation of intestines by creating a mechanical and reflex effect on the intestines. In this study, the constipation problem of the older adults in the experimental group, who were applied abdominal massage, decreased and the quality of life was found to be higher than that of individuals in the control group. Abdominal massage is a non-invasive, economical technique that can be used for older adults without side effects.⁷⁻¹⁰ However, although abdominal massage has been known for several years, studies regarding this approach are limited. Therefore, randomized controlled trials are required to investigate the effect of abdominal massage on constipation prevention. Nursing practices, such as abdominal massage and complementary therapies, aim to improve individuals' health and quality of life.^{36,37} The findings of the present study emphasize that abdominal massage can be used by nurses as a nonpharmacological method for treating constipation. Moreover, teaching abdominal massage to older adults enables them to cope with constipation without dependency on nurses. It is essential that these results are confirmed via randomized controlled trials.

5. Conclusion

In conclusion, our study results demonstrate that the abdominal massage might be effective in solving the problem of constipation in older adults. Abdominal massage can be applied by nurses as well as older adults can be trained on how to give massage by themselves. Thus, older adults can take care of themselves and independently apply abdominal massage, thereby minimizing/eliminating the problem of constipation.

Authorship statement

As the authors of this paper, we have declared that they all have made a substantial contribution to the information or material submitted for the publication and we have approved the final version of this manuscript.

Contribution of authors

C.B.O. and N.B. conceived and designed the study. C.B.O. and N.B. collected data. C.B.O. and N.B. wrote/drafted/edited the manuscript and interpreted the results. C.B.O. and N.B. conducted analyses, prepared graphs/figures and revised the manuscript. All authors approved the content of this manuscript.

Declaration of competing interest

The authors declare no conflict of interest.

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