

# ORIGINAL ARTICLE

## The Effect of Abdominal Massage with Extra-Virgin Olive Oil on Constipation among Elderly Individuals: A Randomized Controlled Clinical Trial

Amir Faghihi<sup>1</sup>, MS; Sied Saeed Najafi<sup>2</sup>, MS; Mohammad Hashem Hashempur<sup>3</sup>, MD, PhD; Majid Najafi Kalyani<sup>2</sup>, PhD

<sup>1</sup>Student Research Committee, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran;

<sup>2</sup>Department of Medical Surgical Nursing, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran;

<sup>3</sup>Noncommunicable Diseases Research Center, Fasa University of Medical Sciences, Fasa, Iran

### Corresponding Author:

Majid Najafi Kalyani, PhD; Department of Medical Surgical Nursing, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Postal code: 71936-13119, Shiraz, Iran  
Tel: +98 71 36474254; Fax: +98 71 36474252; Email: majidnajafi5@yahoo.com

Received: 9 November 2020    Revised: 30 May 2021    Accepted: 7 June 2021

### ABSTRACT

**Background:** Constipation is one of the most prevalent problems during old age. Abdominal massage is a complementary method in controlling constipation. This study is conducted with the aim of determining the effect of abdominal massage with extra-virgin olive oil on constipation among the elderly.

**Methods:** In this single-blind randomized controlled clinical trial, 54 old individuals in Shiraz nursing homes during November 2018-March 2019 were selected randomly and then allocated to three groups of 18, based on block randomization. The first group underwent abdominal massage with olive oil for five consecutive days (each day one time for 15 minutes). The second group underwent abdominal massage with water similar to the first group. No specific intervention was applied to the control group. All three groups received their medical treatment. The constipation scores were examined using constipation assessment scale (CAS) before the intervention and on the sixth day. Data analysis was done through SPSS 22 using Chi-square, paired t-test, and ANOVA.  $P < 0.05$  was considered as the level of statistical significance.

**Results:** There were no statistically significant differences among the three groups before the intervention. The results demonstrated that the mean score of constipation further decreased in the olive oil group ( $5.62 \pm 1.89$  to  $2.06 \pm 0.99$ ) ( $P \leq 0.001$ ) than the massage with water ( $5.05 \pm 1.25$  to  $3.11 \pm 0.99$ ) ( $P = 0.02$ ), and the control group ( $4.44 \pm 1.38$  to  $5.22 \pm 1.35$ ) ( $P = 0.006$ ).

**Conclusion:** Due to the greater effectiveness of abdominal massage with extra-virgin olive oil, the use of this method is recommended in treatment of constipation among the elderly.

**Trial Registration Number:** IRCT20180923041101N1

**Keywords:** Complementary and alternative medicine, Constipation, Massage, Olive oil, The elderly

**Please cite this article as:** Faghihi A, Najafi SS, Hashempur MH, Najafi Kalyani M. The Effect of Abdominal Massage with Extra-Virgin Olive Oil on Constipation among Elderly Individuals: A Randomized Controlled Clinical Trial. *IJCBNM*. 2021;9(4):268-277. doi: 10.30476/ijcbnm.2021.88206.1495.

## INTRODUCTION

With the increase in life expectancy as well as improvements made in treatment methods, the world's population is becoming old.<sup>1</sup> The world's population increases by 1.7% every year, while the same rate is 2.5% for ages of 65 years and above. Thus, it has been predicted that the world's above-65-year-old population will double by 40 years from now. Among this population, 52% will belong to Asian countries and 40% to developed ones.<sup>2</sup> Previous studies have demonstrated that 80% of the elderly people suffer from at least one chronic disease, which made them prone to the risk of disability and death.<sup>3</sup>

Constipation is one of the most prevalent digestive problems.<sup>4</sup> The prevalence of constipation is different in various countries due to variations in lifestyle and diet.<sup>5</sup> Research has indicated that the prevalence of this disorder was 8-26% in Europe, with a mean of 22.3%.<sup>6</sup> In the studies conducted in Iran, the prevalence of constipation has been reported to vary from 3.5% to 32.9%.<sup>7</sup> As an individual becomes older, the prevalence of constipation increases incredibly. In this context, the prevalence of constipation has been reported to be 34% among females and 26% among males above 84 years of age. With increase in age, this value increased as well.<sup>8</sup>

Constipation can be a symptom of a disease or a disease, and requires examination and consideration due to its long-lasting complications and effects on the patients' life quality.<sup>9-11</sup> Because of the physiological phenomena relevant to old age, immobility, abundant use of medications, decrease in blood pressure, and patients' ignorance, constipation may be accompanied with more complications and troubles in the elderly individuals.<sup>12, 13</sup> Constipation influences different aspects of the elderly people's lives, including the quality of life.<sup>14</sup> Different pharmaceutical and non-pharmaceutical methods have been used for treatment of constipation.<sup>15</sup> Although pharmaceutical methods make up the commonest method of

treatment, long-term use of medications is accompanied by several complications.<sup>16, 17</sup> Given the problems and complications resulting from pharmaceutical treatment, the tendency to use non-pharmaceutical methods, such as complementary medicine and traditional medicine, has increased.<sup>18-20</sup> Abdominal massage is a non-pharmaceutical method for controlling and treating constipation.<sup>5, 21, 22</sup> Several studies have addressed the effect of abdominal massage as an inexpensive and non-aggressive method for treatment of constipation.<sup>23-25</sup> In many studies, traditional oils for abdominal massage have been used for patients with constipation.<sup>26, 27</sup> In Traditional Persian Medicine, application of oil onto the abdomen around the navel was found to be appropriate for treatment of constipation.<sup>28</sup> One of the oils used in Traditional Persian Medicine is olive oil, which has been demonstrated to be effective in treatment of skin diseases including psoriasis, and reduction of heart diseases including atrial fibrillation.<sup>29-31</sup> Extra-virgin olive oil is a type of unrefined olive oil, which is different from other types of olive oil since it is golden green, and tastes mildly hot.<sup>32</sup>

Given the scarcity of studies conducted on the effect of abdominal massage with olive oil and considering evidence with regard to the use of abdominal massage with olive oil for controlling and treating constipation in Traditional Persian Medicine manuscripts, this study aims to investigate the effect of abdominal massage using extra-virgin olive oil on constipation among elderly individuals.

## MATERIALS AND METHODS

This single-blind randomized controlled clinical trial was conducted during November 2018-March 2019 on the residents of nursing homes in Shiraz, Iran who were selected by simple random sampling. The sample size in this study was calculated based on the previous study.<sup>12</sup> In this calculation, according to the constipation score in the studied groups and considering the error of 1% ( $\alpha=0.01$ ), power of 90% ( $\beta=0.10$ ),

$\mu_1=34.37$ ,  $\mu_2=11.0$ ,  $\sigma_1=25.77$ ,  $\sigma_2=11.58$  and use from the formula for comparing the two means, 54 people (18 people per group) was estimated by MedCalc software by using the following formula:

$$n = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 (\sigma_1^2 + \sigma_2^2)}{(\mu_1 - \mu_2)^2}$$

$$n = \frac{(2.57 + 1.281)^2 (25.77^2 + 11.58^2)}{(34.37 - 11.0)^2}$$

The inclusion criteria of the study were being aged above 60 years (chronological elderly people), obtaining scores >1 based on the constipation assessment scale (CAS), emptying the bowel less than three times a week, and being willing to participate in the study. The exclusion criteria of the study were suffering from cognitive problems (dementia), having a history of surgery in the abdominal area, having an inflammation or open wound around the massage area, suffering from a skin disorder or scar in the abdomen, having a special underlying disease, and consuming other medications which have an interaction with the study goals.

After the methodology was explained and written consent for participation in the study was obtained, the individuals were randomly allocated to three groups of massage with extra-virgin olive oil, massage with water, and control (each containing 18 patients). This was carried out based on permuted block randomization (ABC) using a random number generator. By default, A: massage with extra-virgin olive oil, B: massage with water, and C: control group. Then, among the random numbers from one to 54, based on the random table, the numbers were taken from the table and randomly divided into three groups.

In the abdominal massage with extra-virgin olive oil group, the intervention was carried out by a trained and skilled masseur according to the abdominal massage guidelines introduced by the National Health System.<sup>33</sup> Abdominal massage with olive oil was performed using 20 milliliters of extra-virgin olive oil for 15 minutes at a specific

time period (8-11 AM) for five consecutive days in different nursing homes.<sup>26</sup> In this method, abdominal massage was carried out at a 2-4 cm depth by a common masseur for males and by a common masseuse for females. This was done through eight steps as follows:

- 1- Three movements from the pubic symphysis to the navel
- 2- Three movements from the two sides of the pelvis toward the pubic symphysis
- 3- Right wise rotation from the pubic symphysis to the surroundings
- 4- Small rotation in the left lower abdomen
- 5- Repetition of step 4 in higher parts and the entire abdomen
- 6- Repetition of steps 4 and 5
- 7- Horizontal movement of the abdomen from left to right
- 8- Vibrations at all above points.<sup>33</sup>

The participants' constipation scores were assessed before the intervention and on the sixth day using the CAS by a research assistant who was unaware of the study groups. In the group of abdominal massage with water, abdominal massage was carried out in eight steps using water. However, no complementary intervention was performed in the control group. All three groups received their medications prescribed by the nursing home physician.

In this study, the data were collected using a demographic information form and the CAS. The demographic form included information about age, gender, marital status, lifestyle (activity level, daily use of water, types of food, and daily use of tea), and history of diseases. This questionnaire was provided after review of the literature and consultation with experts. Its validity was confirmed after it was sent to the relevant experts and revised according to their comments. The CAS was designed by McMillan and Williams in 1989.<sup>34</sup> The content validity and reliability of the tool have been examined and confirmed in different studies.<sup>34, 35</sup> In the study, for instance, the reliability (Intra-class correlation coefficients) of the tool was reported to be 0.97.<sup>35</sup> This scale consisted of eight items including 'abdominal

distension or bloating’, ‘changing in amount of gas passed rectally’, ‘less frequent bowel movement’, ‘oozing liquid stool’, ‘rectal fullness or pressure’, ‘rectal pain with bowel movement’, ‘small volume of stool’, and being ‘unable to pass stool’. This scale is a summated rating scale ranging from 0: no problems, 1: average problem, and 2: severe problem. The total score of the instrument could range from 0 to 16, where zero indicated the absence of constipation and 16 represented severe constipation.<sup>34</sup>

The collected data were entered into the SPSS 22 software. After verification of normal distribution, the data were analyzed using descriptive and inferential statistical tests, such as chi-square, paired t-test, and ANOVA.  $P < 0.05$  was considered to be statistically significant.

The study was approved by the Ethics Committee of Shiraz University of Medical

Sciences (IR.SUMS.REC.1397.698). The study was also conducted according to the Declaration of Helsinki. After the research objectives and methodology were explained, written consent forms were obtained from the patients. Moreover, they were ensured that they could withdraw from participation at any time if they were unwilling to cooperate.

## RESULTS

This study was conducted on 54 elderly individuals suffering from constipation who met the inclusion criteria. During the study, two participants in the group of massage with olive oil were excluded due to withdrawal from cooperation and discontinuing intervention (Figure 1). As two participants were excluded from the study, 52 individuals were entered into the final analysis. The participants’ age ranged from 60-93, with the mean age of  $71.38 \pm 9.93$

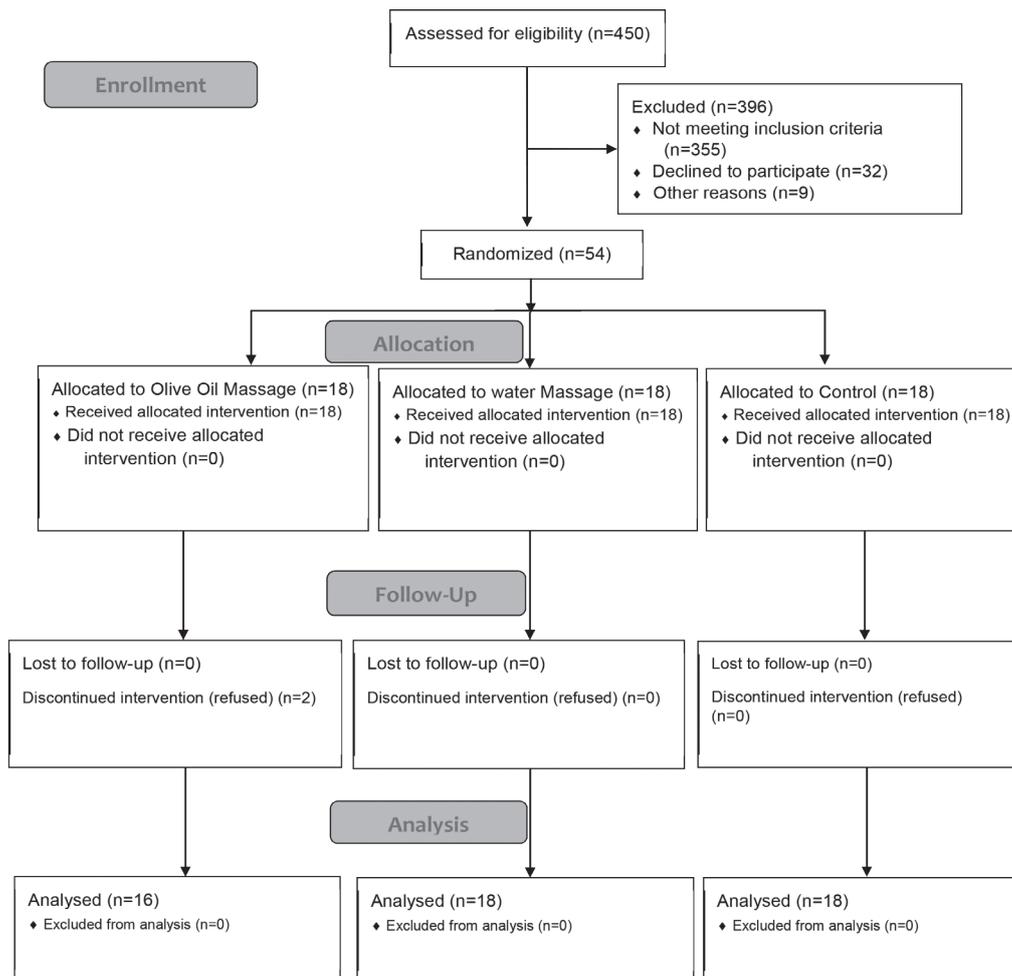


Figure 1: CONSORT flow chart of the participants

years. The results showed no significant difference among the three groups regarding the participants' mean age ( $P=0.54$ ). The results also revealed no significant differences among the three groups with regard to other demographic variables (Table 1). There was no statistically significant difference among the three groups as to lifestyle variables (activity level, daily use of water, types of food, daily use of tea and coffee, and daily use of fruits) ( $P>0.05$ ).

The results demonstrated no statistically significant differences among the three groups regarding the mean score of constipation before the intervention (Table 2). After the intervention, however, a statistically significant difference was observed among the three groups in terms of the mean score of constipation. According to the LSD post hoc test, the constipation score of the massage

with extra-virgin olive oil was statistically significant with the massage with water ( $P\leq 0.001$ ) as well as the control group ( $P\leq 0.001$ ).

As Table 2 shows, the mean score of constipation was  $5.62\pm 1.89$  before the intervention, which decreased to  $2.06\pm 0.99$  after that in the massage with extra-virgin olive oil group ( $P\leq 0.001$ ). In the group of massage with water, the mean score of constipation was  $5.05\pm 1.25$  before the intervention, which decreased to  $3.11\pm 0.99$  after that, and the difference was statistically significant ( $P=0.02$ ). The control group's mean score of constipation was  $4.44\pm 1.38$  before the intervention, which increased to  $5.22\pm 1.35$  after five days, and the difference was statistically significant ( $P=0.006$ ) (Table 2).

Analysis of the sub-items of CAS showed

**Table 1:** Distribution of the elderly people in the three groups in terms of demographic variables

		Massage with olive oil	Massage with water	Control	P value*
		N (%)	N (%)	N (%)	
Gender	Male	7 (43.8)	10 (55.6)	11 (61.1)	0.69
	Female	9 (56.3)	8 (44.4)	7 (38.9)	
Education level	Illiterate	2 (12.5)	8 (44.4)	4 (22.2)	0.74
	Primary school	7 (43.8)	3 (16.7)	4 (22.2)	
	Middle school	2 (12.5)	2 (11.1)	4 (22.2)	
	High school	3 (18.8)	3 (16.7)	3 (16.7)	
	Associate Degree	1 (6.3)	1 (5.6)	2 (11.2)	
	Bachelor's or above	1 (6.3)	1 (5.6)	1 (5.6)	
History of smoking	Yes	3 (18.8)	5 (27.8)	4 (22.2)	0.91
	No	13 (81.3)	13 (72.2)	14 (77.8)	
History of medication use	Yes	5 (31.3)	9 (50)	7 (38.9)	0.52
	No	11 (68.8)	9 (50)	11 (61.1)	
Doing daily sports	Yes	4 (25)	0 (0)	2 (11.1)	0.06
	No	12 (75)	18 (100)	16 (88.9)	

\*Chi-square test

**Table 2:** Comparison of the elderly participants' mean scores of constipation before and after the intervention in three groups

Group	Constipation		d score	Effect size	P value*
	Before the intervention Mean±SD	After the intervention Mean±SD			
Control	4.44±1.38	5.22±1.35	0.77±1.06	0.57	0.006
Massage with water	5.05±1.25	3.11±0.99	-1.94±0.93	1.72	0.02
Massage with olive oil	5.62±1.89	2.06±0.99	-3.56±1.26	2.35	$\leq 0.001$
P value**	0.87	$\leq 0.001$			

\*Paired t-test; \*\*One-way ANOVA

**Table 3:** Comparison of the eight items of constipation assessment scale before and after the intervention among three groups

Items	Groups	Control	Massage with water	Massage with olive oil	P value*
		Mean±SD	Mean±SD	Mean±SD	
Abdominal distension or bloating	Before	0.62±0.61	0.79±0.63	1.17±0.62	0.04
	After	0.94±0.44	0.47±0.51	0.44±0.51	0.01
Changing in amount of gas passed rectally	Before	0.56±0.51	0.42±0.51	0.39±0.5	0.56
	After	0.5±0.51	0.16±0.37	0	0.001
Less frequent bowel movement	Before	0.75±0.68	0.89±0.58	1.05±0.54	0.007
	After	0.44±0.51	0.39±0.5	0.22±0.43	0.40
Oozing liquid stool	Before	0.62±0.25	0	0.11±0.32	0.34
	After	0.62±0.25	0	0	0.31
Rectal fullness or pressure	Before	0.75±0.44	1±0.57	0.72±0.57	0.25
	After	0.81±0.4	0.58±0.61	0.28±0.46	0.01
Rectal pain with bowel movement	Before	0.44±0.51	0.68±0.48	0.72±0.57	0.24
	After	0.69±0.6	0.47±0.51	0.28±0.46	0.10
Small volume of stool	Before	0.62±0.5	0.31±0.48	0.55±0.51	0.15
	After	0.87±0.72	0.74±0.45	0.33±0.48	0.02
Unable to pass stool	Before	0.62±0.5	0.68±0.48	0.83±0.51	0.48
	After	0.94±0.44	0.58±0.61	0.28±0.46	0.003

\*Kruskal-Wallis Test

that there was a significant difference among the three groups of the study after the intervention regarding abdominal distension or bloating, change in the amount of gas passed rectally, rectal fullness or pressure, small volume of stool, and inability to pass stool ( $P < 0.05$ ) (Table 3).

## DISCUSSION

Constipation is one of the most prevalent digestive problems among the elderly, which causes negative effects on their quality of life due to its chronic nature.<sup>12</sup> Evidence has demonstrated that the prevalence and severity of constipation were higher in old ages than in other periods of life.<sup>8, 36</sup>

The results of the present study demonstrated that the mean score of constipation decreased from before the intervention to after that in the abdominal massage with extra-virgin olive oil. The significant decrease in the constipation scores in this group in comparison with other groups indicated the effectiveness of the method in controlling constipation among the elderly participants.

Studies have demonstrated that abdominal massage was an effective method of treatment

for constipation among the elderly.<sup>13, 36</sup> For instance, a study performed on patients who were suffering from Parkinson's disease revealed that abdominal massage for six weeks along with lifestyle training alleviated the symptoms of constipation.<sup>23</sup> In the same line, a study performed on patients who suffered from cancer showed that aromatic abdominal massage reduced constipation in these patients.<sup>26</sup> Similarly, another study reported that abdominal massage using rosemary oil, sweet lemon, black pepper, and sweet marjoram was effective in controlling constipation among the elderly individuals who were suffering from heart attack.<sup>37</sup> Abdominal massage with extra-virgin olive oil has many advantages over many medical methods, including low cost, absence of specific side effects, availability, and absence of interference with other methods.<sup>23-25</sup> When aromatic oil is absorbed by the skin, the body undergoes physiological, psychological, and pharmacological changes. Physiologically, this causes the individual to be relaxed and stimulated. Psychologically, it causes a reaction as the oil is smelt. Pharmacologically, it causes chemical and hormonal changes as the oil enters the blood.<sup>38</sup> Furthermore, the fact that the method is non-aggressive causes the

individual to get along better with this type of treatment than with alternative methods, such as enema.<sup>39</sup> The use of complementary medicine methods in the treatment of patients with constipation has been recommended in previous studies.<sup>40, 41</sup>

In the simple abdominal massage group, the mean score of constipation decreased from before the intervention to after that. Although the decrease in the constipation score was significant, it was less than that in the massage with extra-virgin olive oil group. The study performed on patients hospitalized at special departments demonstrated that abdominal massage twice a day for three days reduced constipation in these patients.<sup>12</sup> The study performed on multiple sclerosis patients also revealed that abdominal massage accompanied with treatment advice had a positive effect on decreasing constipation in the patients.<sup>42</sup> In the same line, another study indicated that abdominal massage alleviated constipation in elderly people.<sup>13</sup> Other studies conducted in this regard have also shown that abdominal massage alleviated or reduced the symptoms of constipation.<sup>21, 23, 37</sup>

In the control group, the mean score of constipation increased from before the intervention to after that. This implies that lack of complementary intervention caused the condition to deteriorate. As all three groups received their medical treatment, the differences between constipation scores can be attributed to abdominal massage as a complementary method.

Furthermore, as we found more decrease in the scores of patients in the abdominal massage with olive oil, it can be attributed to the absorption of oil via abdominal skin as well as facilitating massage than the simple abdominal massage group.

Using complementary medicine methods is one of the most efficient approaches for treatment of constipation in the present century.<sup>43</sup> Caregivers of the elderly people can help reduce constipation and increase their quality of life using complementary medicine

methods.<sup>44</sup>

One of the most important strengths of this study was conducting the intervention by using herbal oil used in Traditional Persian Medicine. The present study had some limitations which should be noted. This study was conducted on the elderly who were residing in the nursing homes. In addition, using only CAS for assessing constipation may not be comprehensive compared with combination with clinical examinations. Moreover, the biomedical mechanism of action for this procedure is not known. Finally, different laxative categories which were used by participants were not recorded.

## CONCLUSION

The present study demonstrated that abdominal massage using olive oil considerably alleviated the symptoms of constipation in the elderly individuals in comparison to the control group. Given the obtained results of the present study, healthcare professionals are recommended to be encouraged to apply this simple, inexpensive, and non-invasive method for controlling constipation among the elderly people who reside in nursing homes. Future studies are required to evaluate the effects of abdominal massage with olive oil on constipation in other clinical conditions.

## ACKNOWLEDGEMENT

This article was extracted from the M.Sc. thesis written by Amir Faghihi in the field of Geriatric Nursing and financially supported by Shiraz University of Medical Sciences, Shiraz, Iran (grant No. 97-01-08-17389). The authors would like to thank all participants for their collaboration in this study. Thanks also go to Ms. A. Keivanshekouh at the Research Improvement Center of Shiraz University of Medical Sciences for improving the use of English in the manuscript.

**Conflict of Interest:** None declared.

**REFERENCES**

- 1 Li J, Han X, Zhang X, Wang S. Spatiotemporal evolution of global population ageing from 1960 to 2017. *BMC Public Health*. 2019;19:127.
- 2 Khosravan S, Alaviani M, Alami A, Tavakolizadeh J. Epidemiology of loneliness in elderly women. *Journal of Research and Health*. 2014;4:871-7.
- 3 Woo Ek, Han C, Jo SA, et al. Morbidity and related factors among elderly people in South Korea: results from the Ansan Geriatric (AGE) cohort study. *BMC Public Health*. 2007;7:10.
- 4 Wald A. Constipation and Defecation Problems. US: American College of Gastroenterology; 2016. [Cited 15 May 2021]. Available from: <https://gi.org/topics/constipation-and-defecation-problems/>
- 5 Kayikci EE, Kocatepe V, Akyuz F, Can G. The Effects of Abdominal Massage on the Management of Constipation: A Systematic Review of Randomised Controlled Trials. *Bezmialem Science*. 2020;8:311-7.
- 6 Peppas G, Alexiou VG, Mourtzoukou E, Falagas ME. Epidemiology of constipation in Europe and Oceania: a systematic review. *BMC Gastroenterology*. 2008;8:5.
- 7 Irajli N, Keshteli AH, Sadeghpour S, et al. Constipation in Iran: SEPAHAN systematic review No. 5. *International Journal of Preventive Medicine*. 2012;3:S34-41.
- 8 Gallegos-Orozco JF, Foxx-Orenstein AE, Sterler SM, Stoa JM. Chronic constipation in the elderly. *The American Journal of Gastroenterology*. 2012;107:18-25.
- 9 Shin JE, Jung HK, Lee TH, et al. Guidelines for the diagnosis and treatment of chronic functional constipation in Korea, 2015 revised edition. *Journal of Neurogastroenterology and Motility*. 2016;22:383-411.
- 10 Bove A, Bellini M, Battaglia E, et al. Consensus statement AIGO/SICCR diagnosis and treatment of chronic constipation and obstructed defecation (part II: treatment). *World Journal of Gastroenterology*. 2012;18:4994-5013.
- 11 Bliss DZ. Management of Fecal Incontinence for the Advanced Practice Nurse. Switzerland: Springer International Publishing; 2018.
- 12 Dehghan M, Fatehi Poor A, Mehdipoor R, Ahmadinejad M. Does abdominal massage improve gastrointestinal functions of intensive care patients with an endotracheal tube? a randomized clinical trial. *Complementary Therapies in Clinical Practice*. 2018;30:122-8.
- 13 Cevik K, Çetinkaya A, Gökbel KY, et al. The Effect of Abdominal Massage on Constipation in the Elderly Residing in Rest Homes. *Gastroenterology Nursing*. 2018;41:396-402.
- 14 Wald A, Scarpignato C, Kamm M, et al. The burden of constipation on quality of life: results of a multinational survey. *Alimentary Pharmacology & Therapeutics*. 2007;26:227-36.
- 15 Tack J, Müller-Lissner S, Stanghellini V, et al. Diagnosis and treatment of chronic constipation—a European perspective. *Neurogastroenterology & Motility*. 2011;23:697-710.
- 16 Preece J. Introducing abdominal massage in palliative care for the relief of constipation. *Complementary Therapies in Nursing and Midwifery*. 2002;8:101-5.
- 17 Rao SS. Dyssynergic defecation and biofeedback therapy. *Gastroenterology Clinics of North America*. 2008;37:569-86.
- 18 Bahraini S, Naji S, Mannani R, Bekhradi R. The effect of massage therapy on the quality of sleep in women with multiple sclerosis being admitted by isfahan MS Association. *Nursing and Midwifery Journal*. 2011;8:197-203. [In Persian]
- 19 Maddocks W, Jennings W, Wilkinson JM. Aromatherapy practice in nursing: literature review. *Journal of Advanced Nursing*. 2004;48:93-103.
- 20 Wilkinson S, Barnes K, Storey L. Massage for symptom relief in patients with cancer:

- systematic review. *Journal of Advanced Nursing*. 2008;63:430-9.
- 21 Turan N, Atabek Aşt T. The effect of abdominal massage on constipation and quality of life. *Gastroenterology Nursing*. 2016;39:48-59.
  - 22 Ayas S, Leblebici B, Sözü S, et al. The effect of abdominal massage on bowel function in patients with spinal cord injury. *American Journal of Physical Medicine & Rehabilitation*. 2006;85:951-5.
  - 23 McClurg D, Hagen S, Jamieson K, et al. Abdominal massage for the alleviation of symptoms of constipation in people with Parkinson's: a randomised controlled pilot study. *Age and Ageing*. 2016;45:299-303.
  - 24 Sinclair M. The use of abdominal massage to treat chronic constipation. *Journal of Bodywork and Movement Therapies*. 2011;15:436-45.
  - 25 Uysal N, Eser I, Akpınar H. The effect of abdominal massage on gastric residual volume: a randomized controlled trial. *Gastroenterology Nursing*. 2012;35:117-23.
  - 26 Lai T, Cheung M, Lo C, et al. Effectiveness of aroma massage on advanced cancer patients with constipation: a pilot study. *Complementary Therapies in Clinical Practice*. 2011;17:37-43.
  - 27 Nam MJ, Bang YI, Kim TI. Effects of abdominal meridian massage with aroma oils on relief of constipation among hospitalized children with brain related disabilities. *Journal of Korean Academy of Nursing*. 2013;43:247-55.
  - 28 Jaladat AM, Nimrooz M, Karimi M, et al. Massage therapy in Iranian traditional medicine. *Journal of Rehabilitation Medicine*. 2012;1:51-62. [In Persian]
  - 29 Kiechl-Kohlendorfer U, Berger C, Inzinger R. The effect of daily treatment with an olive oil/lanolin emollient on skin integrity in preterm infants: a randomized controlled trial. *Pediatric Dermatology*. 2008;25:174-8.
  - 30 Al-Waili N. Clinical and mycological benefits of topical application of honey, olive oil and beeswax in diaper dermatitis. *Clinical Microbiology and Infection*. 2005;11:160-3.
  - 31 Martínez-González MÁ, Toledo E, Arós F, et al. Extravirgin olive oil consumption reduces risk of atrial fibrillation: the PREDIMED (Prevención con Dieta Mediterránea) trial. *Circulation*. 2014;130:18-26.
  - 32 Fayegh M, Qajarbeigi P, Haj Hosseini Babaei A, Mohammadpoorasl A. Assessment of the Chemicals and Oxidative Properties of Imported Extra Virgin Olive Oils. *Journal of Food Technology and Nutrition*. 2015;12:27-34. [In Persian]
  - 33 McClurg D, Harris F, Goodman K, et al. Abdominal massage plus advice, compared with advice only, for neurogenic bowel dysfunction in MS: a RCT. *Health Technology Assessment*. 2018;22:1-134.
  - 34 McMillan SC, Williams FA. Validity and reliability of the Constipation Assessment Scale. *Cancer Nursing*. 1989;12:183-8.
  - 35 Seyyedraşoli A, Ghahramanian A, Azizi A, et al. Comparison of effectiveness of reflexology and abdominal massage on constipation among orthopedic patients: A Single-Blind randomized controlled trial. *International Journal of Medical Research & Health Sciences*. 2016;5:33-40.
  - 36 Baran A, Ates S. The Effects of Abdominal Massage in the Management of Constipation in Elderly People: A Randomized Controlled Study. *Topics in Geriatric Rehabilitation*. 2019;35:134-40.
  - 37 Kim YG, Bae HS. The Effect of Abdominal Massage with Aroma Oils on Constipation in Elderly Stroke Patients. *Asian Journal of Beauty and Cosmetology*. 2013;11:883-90.
  - 38 Shenton D. Does aromatherapy provide an holistic approach to palliative care? *International Journal of Palliative Nursing*. 1996;2:187-91.
  - 39 Moss L, Smith M, Wharton S, Hames A. Abdominal massage for the treatment of idiopathic constipation in children with profound learning disabilities: a single case study design. *British Journal of*

- Learning Disabilities. 2008;36:102-8.
- 40 Lämås K. Using massage to ease constipation. *Nursing Times*. 2011;107:26-7.
- 41 Harrington KL, Haskvitz EM. Managing a patient's constipation with physical therapy. *Physical Therapy*. 2006;86:1511-9.
- 42 McClurg D, Hagen S, Hawkins S, Lowe-Strong A. Abdominal massage for the alleviation of constipation symptoms in people with multiple sclerosis: a randomized controlled feasibility study. *Multiple Sclerosis Journal*. 2011;17:223-33.
- 43 Connor M, Hunt C, Lindley A, Adams J. Using abdominal massage in bowel management. *Nursing Standard*. 2014;28:37-42.
- 44 Woodward S. Assessment and management of constipation in older people. *Nursing Older People*. 2012;24:21-6.