

## ORIGINAL ARTICLE

# Comparing the Effect of Hand and Foot Reflexology Massages on the Severity of Nausea, Vomiting and Ileus in patients after Abdominal Surgery

ELHAM SHAHRAKI MOGHADAM<sup>1</sup>, ZAHRASADAT\_MANZARI<sup>2</sup>, HOSSEIN RASHKI GHALENOW<sup>\*3</sup>, HAJAR NOORI SANCHOOLI<sup>4</sup>

<sup>1</sup>Instructor of Nursing, School of Nursing and Midwifery, Zabol University of Medical Sciences, Zabol, Iran

<sup>2</sup>Associate Professor of Medical-Surgical Nursing, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran

<sup>3</sup>Instructor of Nursing, School of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran

<sup>4</sup>Instructor of Nursing, School of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran

Correspondence to Hossein Rashki Ghalenow\* E-mail: [Rashkihossein11@gmail.com](mailto:Rashkihossein11@gmail.com)

## ABSTRACT

**Background:** Common clinical problems after surgery include nausea, vomiting and ileus that many patients complain of after their surgery. These complications can delay the patient's discharge from hospital. Nowadays, to reduce drug side effects, the use of complementary medicine, including reflexology, has received a great deal of attention.

**Aim:** To compare the effect of hand and foot reflexology massages on the severity of nausea, vomiting and ileus in patients after abdominal surgery.

**Methods:** This is a clinical trial study that was conducted between 2013 and 2015 in the emergency surgical departments of Imam Reza (AS) and Ghaem (AS) hospitals in Mashhad. The samples of this study included 90 women with cholecystitis and appendicitis who met the inclusion criteria. In this study, patients were randomly divided into 3 groups of hand reflexology massage, foot reflexology massage and control. To check the digestive status, gastrointestinal sounds were checked every hour using a clinical stethoscope. Also, information on gas and feces elimination was collected and recorded every hour. The intervention was performed 1 and 12 hours after the surgery. In both groups of hands and foot reflexology massages, after general massage of the hands and feet, the areas related to the abdominal distension and removal of the ileus were pressed. It should be noted that, the duration of massage for each person was 10 minutes (20 minutes in total). Data were analyzed by SPSS software version 16 using Chi-square, Fisher's exact test, two-way ANOVA, Kruskal-Wallis test and repeated measures ANOVA.

**Results:** There was no statistically significant difference in the mean score of severity of nausea before the intervention between the three groups ( $p = 0.90$ ), but after the intervention a significant difference was observed in the mean score of severity of nausea between the three groups ( $p=0.002$ ). Also, the result of ANOVA test with repeated measure showed a statistically significant difference in the mean score of nausea by group and stage ( $p<0.001$ ). There was also no statistically significant difference in the frequency of vomiting severity between the three groups after the intervention. However, at 4 and 24 hours after the intervention, a statistically significant difference was observed between the three groups in that regard.

**Conclusion:** The results showed that both types of hand and foot reflexology massage has positive effects on nausea and return of gastrointestinal movements, so nurses can use reflexology as a non-pharmacological and complementary method to reduce the severity of nausea and return gastrointestinal movements in postoperative patients. Since the reflexology had little or no effect on the severity of vomiting and the acceleration of gastrointestinal movements in patients, further studies in this area are recommended.

**Keywords:** Reflexology, Pain, Nausea and vomiting, Ileus, Surgery

## INTRODUCTION

Today, surgery is the treatment of choice for many diseases and injuries<sup>1</sup>. Nausea and vomiting are common problems after the surgery<sup>2</sup> and not only are these problems uncomfortable, but also they can lead to dehydration, electrolyte disturbances, recovery delays, and prolonged hospital stay<sup>3</sup>. Postoperative nausea and vomiting, in addition to medical problems, can cause psychological problems in patients, which makes future surgeries more stressful and unacceptable for patients. Many patients find the prevention of postoperative nausea and vomiting more important than postoperative pain, and for many patients, prolonged nausea is worse than simple vomiting<sup>4</sup>. Side effects of medications used for nausea and vomiting are also problematic, as droperidol may cause

drowsiness and extra-pyramidal side effects, metoclopramide may cause diarrhea and headache, and phenobarbital may increase liver enzymes<sup>2</sup>. Ileus after abdominal surgery may also lead to many problems such as increased hospital stay, pain, abdominal distension, inability to start feeding, and ultimately delayed recovery<sup>5</sup>. Ileus after surgery is a neurological, hormonal and pharmacological process that occurs in the form of abdominal distension, abdominal pain, nausea, vomiting, inability to defecate and intolerance to take solid food, and is also seen in almost half of postoperative patients<sup>6</sup>. Treatment of ileus includes limiting food intake and correcting underlying causes<sup>7</sup>. Alternative methods should be used to prevent these side effects<sup>2</sup>. Non-pharmacological methods have been the subjects of interest for patients and their families during the past

decade, as they have low cost, high effectiveness and fewer side effects. They also are less invasive, no-addictive and more accessible than conventional medications<sup>8</sup>. Reflexology is one of the therapies in complementary medicine and belongs to the manual therapy group, whose philosophy is to use a special tactile technique or pressure on the specific points on the palms of hands and soles of the feet to make bio-physiological changes in the body<sup>9</sup>. In this method, the fingers are used to press the key points of the skin surface to stimulate and induce the body's natural self-healing abilities. This vital force circulates among the organs of the body through 12 main channels or meridians<sup>10</sup> and there are about 365 points on these channels, each of which is associated with specific organs in the body<sup>11</sup>. The existence of some doubts about complementary medicine in medical community has made it challenging for such therapies to be used in mainstream medicine, and this highlights the importance of research in this regard to scientifically confirm the effectiveness of complementary medicine. So in this study, the researcher examined and compared the effects of safe and non-invasive hand and foot reflexology massages on the severity of nausea, vomiting and ileus of patients who just had abdominal surgery. The researcher hopes that, by introducing complementary medicine methods such as hand and foot reflexology massages to Iranian nursing community, we take an effective step towards reducing the severity of nausea, vomiting and ileus in patient after abdominal surgery.

## MATERIALS AND METHODS

This study is an interventional and quasi-experimental study with pre and post-test method, which was conducted on 90 women undergoing cholecystectomy and appendectomy in the Imam Reza (AS) and Ghaem (AS) hospitals in Mashhad. The samples were randomly divided into 3 groups of hand reflexology massage (n=30), foot reflexology massage (n=30), and control (n=30). In the surgical department, the researcher, after introducing herself and giving a brief description of the purpose and method of study, selected the eligible samples based on the inclusion criteria and randomly (flipping coin) divided them in three groups of hand massage, foot massage and control. She also obtained a written consent from patients who wished to participate in the study. Inclusion criteria were; being a woman aged 18-65 years, willingness to participate in the study, undergoing elective cholecystectomy or open appendectomy, having no history of surgery, having no physical and motor-sensory disorders in the hands and feet, especially the soles of the feet, having no chronic pain, having no history of acute and chronic nausea and vomiting (gastrointestinal and ear disorders) and other underlying diseases, insensitivity to massage, having no deep vein thrombosis, and having minimal literacy and no addiction to drugs or alcohol. The exclusion criteria included; unwillingness to participate in the study, surgery lasting more than 2 hours, and having severe postoperative complications such as heavy bleeding, etc. The tools used in this study included a form for selecting research units, a demographic questionnaire, an intervention registration and monitoring form, a scale for

measuring the severity of vomiting and nausea, and a questionnaire to measure gastrointestinal movements. One hour after the arrival of eligible patients to the ward from the operating room, their severity of nausea and vomiting, and their gastrointestinal movements were assessed and recorded. Then, in the intervention groups, the intervention was performed by the researcher twice (one hour and 12 hours after the operation). In the hand massage group, the massage was started from the wrist area of the left hand and continued to the back of the hand, each finger, and the palm of the hand according to the reflexology massage protocol. Then, the right hand was massaged in the same way. After the general massage, the areas related to abdominal distension and elimination of ileus were massaged. In the foot massage group, the massage started from the middle of left foot sole and continued to the outer surface of the left foot, and back of the left foot (Dorsum). Then, the right foot was massaged in the same order as the left foot. After the general massage, the areas related to the abdominal distension and elimination of ileus were massaged. In the hand massage group, the intervention was performed on each hand for 10 minutes and in the foot massage group, the intervention was performed on each foot for 10 minutes. After the intervention, at 4 hours, 12 hours and 24 hours after the operation, the severity of nausea and vomiting was assessed and recorded, and gastrointestinal movements were listened to by stethoscope every 1 hour until the first gastrointestinal sound was heard. The patient was also asked to inform the research whenever she felt the need for elimination of gas and feces. In addition, the tools were completed with the help of a researcher who did not know the type of intervention. However, a sample form was completed by the researcher and the researcher's assistant, and then the consistency was determined. Also, each medication that patients received was accurately recorded.

**Ethics approval and consent to participate:** This study was approved by the ethics committee at Mahshad University of Medical Sciences (NO 8027111 DATE 2014/1/11) receiving permission to enter the research setting, obtaining oral and written informed consent, anonymity, and confidentiality of Participants, an allowance to leave the research freely.

## RESULTS

Demographic information in this study showed that the mean age of patients was  $35.4 \pm 16.6$  years and most of them 52.2% (47 people) were married. Frequency distribution of study data in terms of level of education showed that the majority of participants had diploma education (27.7%) and most of them 57.7% (52 people) had cholecystectomy. The results of Kruskal-Wallis test in regard to the effect of hand and foot reflexology massage on the severity of nausea in patients after abdominal surgery showed no statistically significant difference between the three groups before the intervention ( $p=0.9$ ) and the three groups were homogeneous in terms of this variable. But immediately after the intervention, the difference in the mean scores of nausea between the three groups was statistically significant ( $p= 0.002$ ). The results

of ANOVA analysis with repeated measures showed that, the mean score of severity of nausea varied significantly by group and stage ( $p < 0.001$ ), (Table 1). Also, the results of Kruskal-Wallis test regarding the effect of hand and foot reflexology massage on the severity of vomiting in patients after abdominal surgery showed no statistically significant difference in the mean score of severity of vomiting between the three groups before and after the intervention ( $P = 0.212$ ), (Table 2). The results of Kruskal-Wallis test

regarding the effect of hand and foot reflexology massage on gastrointestinal movements of patients after abdominal surgery showed that after the intervention, the mean time of the first gastrointestinal sound was not significantly different between the three groups ( $P = 0/194$ ). However, there was a statistically significant difference in the mean time of first gastric gas and feces elimination between the three groups (Table 3).

Table 1: Mean and standard deviation of the score of nausea severity in patients before and after the intervention in the three stages of before the intervention, immediately after the intervention, and also 4, 12 and 24 hours after the intervention in the three study groups

Group	Hand reflexology massage		Foot reflexology massage		Control		Intervention		
	Mean ± SD	Frequency	Mean ± SD	Frequency	Mean ± SD	Frequency	Type of test	Result	
Before intervention	4.8 ± 2.6	30	4.6 ± 2.0	30	4.6 ± 2.1	30	Kruskal-Wallis	$X^2=0.1$ , Df=2 P=0.9	
Immediately after intervention	2.5 ± 2.0	30	2.9 ± 1.9	30	4.6 ± 2.5	30	Kruskal-Wallis	$X^2=12.8$ , Df=2 P=0.002	
4 h after intervention	1.5 ± 1.25	30	1.9 ± 1.1	30	3.1 ± 1.9	30	Kruskal-Wallis	$X^2=15.1$ , Df=2 P=0.001	
12 h after intervention	0.6 ± 0.5	30	0.7 ± 0.6	30	1.3 ± 0.9	30	Kruskal-Wallis	$X^2=10.1$ , Df=2 P=0.006	
24 h after intervention	0.3 ± 0.4	30	0.4 ± 0.5	30	0.7 ± 0.6	30	Kruskal-Wallis	$X^2=8.6$ , Df=2 P=0.013	
Result of repeated measure									P<0.001, f=1.88 F=170.6

Table 2: Frequency distribution of the score of vomiting severity in the studied patients before and after the intervention in the three stages of before the intervention, immediately after the intervention, and also 4, 12 and 24 hours after the intervention in the three study groups

Group	Severity of vomiting	Hand reflexology massage		Foot reflexology massage		Control group		Result of Chi-square test
		Frequency	%age	Frequency	%age	Frequency	%age	
		Before intervention	0	4	13.3	3	10	
1	11	36.7	13	43.3	10	33.3		
2	13	43.3	13	43.3	14	46.7		
3	2	6.7	1	3.3	2	6.7		
Immediately after intervention	0	10	33.3	5	16.7	5	16.7	Fisher's Exact Test= 0.226 P= 0.212
1	17	56.7	15	50	18	60		
2	3	10	8	26.7	4	13.3		
3	0	0	2	6.7	3	10		
4 h after intervention	0	22	73.3	14	46.7	9	30	Fisher's Exact Test=0.018 P= 0.035
1	7	23.3	12	40	14	46.7		
2	1	3.3	4	13.3	6	20		
3	0	0	0	0	1	1		
12 h after intervention	0	25	83.3	21	70	17	56.7	Fisher's Exact Test=0.151 P= 0.154
1	5	16.7	8	26.7	10	33.3		
2	0	0	1	3.3	3	10		
3	0	0	0	0	0	0		
24 h after intervention	0	29	96.7	27	90	22	73.3	Fisher's Exact Test=0.035 P=0.024
1	1	3.3	3	10	8	26.7		
2	0	0	0	0	0	0		
3	0	0	0	0	0	0		

Table 3: Mean and standard deviation of the score of the time of onset of gastrointestinal movements, and gas and feces elimination of the studied patients before and after the intervention in the three stages of before the intervention, immediately after the intervention, and also 4, 12 and 24 hours after the intervention in the three study groups

Group	Hand reflexology massage		Foot reflexology massage		Control		Intervention	
	Mean ± SD	Frequency	Mean ± SD	Frequency	Mean ± SD	Frequency	Type of test	Result
Time of hearing the first gastrointestinal sound	0.6 ± 2.6	30	0.7 ± 2.43	30	1.1 ± 2.9	30	Kruskal-Wallis	$X^2=3.27$ , Df=2 P=0.194
Time of the first gastric gas extraction	6.0 ± 15.31	30	5.0 ± 15.2	30	10.0 ± 27.1	30	Kruskal-Wallis	$X^2=36.4$ , Df=2 P<0.001
Time of the first feces elimination	18.0 ± 50.3	30	23.3 ± 49.3	30	14.1 ± 64.5	30	Kruskal-Wallis	$X^2=8.91$ , Df=2 P=0.012

## DISCUSSION

The results of present study showed that despite the progressive reduction of nausea in all three study groups (hand reflexology massage, foot reflexology massage, and

control), this reduction in the intervention groups after reflexology massage at the first 24 hours of the surgery was more prominent and faster than the control group. Various studies have evaluated the effects of reflexology on people with different conditions, and just like the present

study, they found it effective in reducing nausea. The study of Najafi Ghezeljeh et al., also showed the positive effect of foot massage on reducing the severity of nausea in patients<sup>12</sup>. Behzadi in a study showed that, the frequency, severity and duration of nausea and vomiting were at their highest in both study groups (intervention and control) before the intervention, but in the intervention group foot reflexology massage significantly reduced the severity of nausea and vomiting<sup>13</sup>. In the study of Asadollahi et al., the mean scores of nausea and vomiting in the reflexology group were significantly lower than the control group<sup>14</sup>. This shows the positive effects of foot reflexology massage in reducing the severity of nausea and vomiting. In a study, Yang et al, examined the effect of foot reflexology massage on nausea and vomiting in breast cancer patients and showed a statistically significant reduction in nausea and vomiting in the intervention group compared to the control group at two different times. They stated that foot reflexology massage was effective in reducing nausea and vomiting in the patients<sup>15</sup>. The results also showed that, there was no statistically significant difference in the frequency of vomiting severity between the three groups. However, at 4 and 24 hours after the intervention, a statistically significant difference was observed between the three groups in that regard. It should be noted that, since a large number of patients in the intervention group experienced vomiting, a significant reduction in the severity of vomiting within 24 hours of surgery in the study groups was not unexpected, and perhaps in studies with larger sample size and in patients with more severe and frequent vomiting, better results can be obtained. Yousefian et al., in their study showed that reflexology did not have a positive effect on vomiting in patients undergoing chemotherapy<sup>16</sup>. The results of this study are consistent with the findings of present study. Çankaya et al., also stated that foot reflexology massage is a cost-effective method to help improve pain, nausea, vomiting and blood circulation in patients after cholecystectomy, although its effect on nausea is greater than vomiting<sup>17</sup>. These results are consistent with the findings of present study. The results also showed a statistically significant difference between the three groups in terms of the mean time of first gas and feces elimination. Woodward et al in their study concluded that, the reflexology leads to reduced constipation and bloating and increases feces elimination<sup>18</sup>. In the study of Inkaya et al., reflexology increased bowel movement in the intervention group compared to the control group<sup>19</sup>. Sajjadi et al., in their study that examined the effect of foot reflexology on constipation of patients with multiple sclerosis, concluded that after the intervention, the severity of constipation in the foot reflexology group was significantly reduced, indicating the effectiveness of reflexology in reducing constipation<sup>20</sup>. Physical and mental symptoms such as dizziness, pain, confusion, etc. become evident in most patients. The illness interrupts the individual's daily functions, social activities, and peace of mind, and instead creates new issues for them<sup>21</sup>. Seyed Rasouli et al., who studied the effect of reflexology and abdominal massage on the severity of constipation in orthopedic patients, concluded that, the time had a significant effect on reducing the severity of constipation during their study, and severity of constipation in the

intervention groups significantly reduced as the study progressed<sup>22</sup>. In the study of Ghaffari et al., there was a significant difference between the mean and standard deviation of the severity of constipation before and after reflexology in the intervention group<sup>23</sup>. Health promotion behaviors include any action that is performed to increase or maintain the individual or group health and self-actualization<sup>24</sup>. The results of these studies are consistent with the findings of present study. In general, it can be said that reflexology massage is effective in reducing nausea and returning of gastrointestinal movements, so nurses can use reflexology as a non-pharmacological and complementary method to reduce the severity of nausea in postoperative patients. Foot reflexology massage may be effective in the reduction of severity of itching in hemodialysis patients; therefore, it is recommended that this technique can use to reduce the itch severity in hemodialysis patients and eliminate the negative effects which may have on their QoL<sup>25</sup>.

## CONCLUSION

The results showed no statistically significant difference in the mean score of severity of nausea before the intervention between the three groups, but after the intervention a significant difference in the mean score of severity of nausea was observed between the three groups. Also, the result of ANOVA test with repeated measure showed a statistically significant difference between the mean scores of nausea by group and stage. There was also no statistically significant difference in the frequency of vomiting severity between the three groups after the intervention, but at 4 and 24 hours after the intervention, a statistically significant difference was observed between the three groups in that regard. According to the results, no statistically significant difference was observed between the three groups in terms of the time of hearing the first gastrointestinal sound, but this difference was significant at the time of the first gas and feces elimination. In general, it can be said that both types of hand and foot reflexology massage are effective in reducing nausea and returning gastrointestinal movements, so nurses can use reflexology as a non-pharmacological and complementary method to reduce the severity of nausea in postoperative patients. However, since reflexology had little or no effect on the severity of vomiting and the acceleration of gastrointestinal movements, further studies in this area are recommended.

**Acknowledgements:** The author(s) are heartily grateful to the Mahshad University of Medical Sciences and all participants of this study.

**Ethics approval:** Prior to the study, ethical approval (IR. NO 8027111 DATE 2014/1/11) was obtained from the faculty of medical sciences at Tarbiat Modares University. This study adhered to the principles of the Declaration of Helsinki. The ethical principles of autonomy, confidentiality, and anonymity were considered for the participants. In order to enter the study, all participants were asked to provide an oral and written informed consent, and their participation in the study was optional. Before taking part in the study, the participants were informed about the purpose and method of the study, and a written informed consent

was collected. All ethical measures including honesty in the provision of results, data confidentiality, and anonymity were considered with care.

**Ethics approval and consent to participate:** This study was approved by the ethics committee at Mahshad University of Medical Sciences (NO 8027111 DATE 2014/1/11). Autonomy, independence, confidentiality and privacy of the participants were considered. Participants were informed about the study. We obtain written and oral informed consent for interview and take notes. The participants were free to exit the study whenever.

**Consent for publication:** All participant were assured of their confidentiality and privacy for data analysis and reporting.

**Availability of data and materials:** The datasets using in the study are available from the corresponding author on reasonable request.

**Competing interests:** The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

**Funding:** 'Not applicable'

**Authors' contributions:** All authors have read and approved the manuscript. All authors contributed to conceptualization, methodology, writing- original draft preparation, and writing- reviewing and editing.

## REFERENCES

- Valiee, Sina, et al. "Assessment the synergism effect of acupoints on preoperative anxiety." *Payesh (Health Monitor)* 9.3 (2010): 279-288.
- Adib-Hajbaghery, M., & Etri, M. (2013). Effect of acupressure of Ex-Le7 point on pain, nausea and vomiting after appendectomy: A randomized trial. *Journal of research in medical sciences: the official journal of Isfahan University of Medical Sciences*, 18(6), 482.
- Sadri B, Nematollahi M, Shahrami R. The effect of acupressure on the reduction of PONV after adenotonsilectomy. *Razi J Med Sci*. 2007;13:119–25.
- Najafi AR, Hydration effects on the incidence of postoperative nausea and vomiting of Shirodkar. *Journal of Bushehr University of Medical Sciences*:2010,13(1):52-58.
- Mohsenzadeh Ledari F, Barat S, Nasiri Amiri F, Aghajani Delavar M, Banihosseini S, Khafri S. Effect of Gum Chewing after Cesarean-Delivery on Return of Bowel Function. *JBUMS*. 2012; 14 (3) :19-24.
- Ghorat, F., Khadem, E., Shirazi, M., Rahimi, R., Bioos, S., & Khadmi, A. (2015). Pathophysiology and treatment post-operative ileus from the viewpoint of traditional medicine and classic medicine: a review article: (2015): 173-192
- Abdollahi AA, Yazdi Kh, Behnam pour N, Niazi M. The effect of chewing gum on bowel movements after appendectomy. *Journal of Arak University of Medical Sciences*:2011; 13(53):38-43.
- Gholamy, R., Dehghan, M., Vanaki, Z., Ghaedi, F., Soheili, M., & Mosarezaee, A. (2014). Efficacy of complementary therapies in reduction of chemotherapy induced nausea and vomiting in breast cancer patients: Systematic review. *Complementary Medicine Journal*, 4(2), 831-844.
- Esmail pour S, Jabbarzad ffect of foot reflexology on the severity of constipation of elderly women residing in kahrizak geriatric nursing homezaki M, Naeeni MK, Fakhrzade H «E» The Journal of Urmia Nursing and Midwifery Faculty2016, 13(10):825-834.
- McCann JS. Nurse's handbook of alternative & complementary therapies. 2nd ed. Lippincott Williams & Wilkins: USA; 2003.
- Yang CH, Lee BH, Sohn SH. A possible mechanism underlying the effectiveness of acupuncture in the treatment of drug addiction. *Evidence-based Complementary and Alternat Med*2007;10:1-10.
- T. Najafi Ghezalje, F. Rahimiha. EFFECT OF FOOT MASSAGING ON NAUSEA INTENSITY OF CANCER PATIENTS. *IJN*. 2004; 17 (37) :32-35.
- Behzadi Saroukolayi H, Alae Karahroudy F. The effects of foot reflexology massage on chemotherapy-induced nausea and vomiting in children suffering from cancer. *Razi J Med Sci*. 2020;26(12):111-121.
- Asadollahi, F., Babazadeh, R., Abdi, H., Esmaily, H. Effect of foot solar plexus reflexology on severity of nausea and vomiting at first half of pregnancy: A Randomized Clinical Trial. *The Iranian Journal of Obstetrics, Gynecology and Infertility*, 2019; 22(6): 54-64. doi:10.22038/ijogi.2019.13744
- Yang JH. [The effects of foot reflexology on nausea, vomiting and fatigue of breast cancer patients undergoing chemotherapy]. *Taeahan Kanho Hakhoe Chi*. 2005 Feb;35(1):177-85. Korean. doi:10.4040/jkan.2005.35.1.177. PMID: 15778569.
- Yoosefian MN, Ezzati Z, Arbabi F, Manoochehri H, Zayeri F. The effect of reflexotherapy on chemotherapy-induced vomiting of patients. *Adv Nurs Midwifery* 2012; 22(7):60-8.
- Çankaya A, Saritaş S. Effect of Classic Foot Massage on Vital Signs, Pain, and Nausea/Vomiting Symptoms After Laparoscopic Cholecystectomy. *Surgical laparoscopy, endoscopy & percutaneous techniques. Surg Laparosc Endosc Percutan Tech*. 2018;28(6):359-365.
- Woodward S, Norton C, Barriball KL. A pilot study of the effectiveness of reflexology in treating idiopathic constipation in women. *Complement Ther Clin Prac*. 2010;16(1):41-6.
- Inkaya, B., & Tuzer, H. (2020). Effect of Reflexology on the Constipation Status of Elderly People. *Yonago acta medica*, 63(2), 115-121.
- Sajadi, M., Davodabady, F., Naseri-Salahshour, V., Harorani, M., & Ebrahimi-Monfared, M. (2020). The effect of foot reflexology on constipation and quality of life in patients with multiple sclerosis. A randomized controlled trial. *Complementary therapies in medicine*, 48, 102270.
- Rahnam M., Fallahi Kh. M., Maddah S.S.B., Ahmadi F., Arbabisarjou A., Religion as an Alleviating Factor in Iranian Cancer Patients: Qualitative Study. 2015, *Asian Pac J Cancer Prev*, 16 (18), 8519-8524.
- Seyyedraassoli A, Ghahramanian A, Azizi A, Goljarian S, Gillespie M « Aydinferd S. Comparison of effectiveness of reflexology and abdominal massage on constipation among orthopedic patients: A single-blind randomized controlled trial. *Health Sciences* 2016, 5(10), 33-40.
- Ghaffari F, Poor Ghaznain T, Shamsalinea A. Effect of sole reflex on pregnant women's constipation severity. *Iran J Obst Gynecol Infertil*. 2007;10(2):27-38.
- Pishkar Mofrad Z, Jahantigh M., Arbabisarjou A., Health Promotion behaviors and chronic diseases of aging in elderly people of Iranshahr, IR. *Iran., Global Journal of Health Science*; 8(3); 2016:139-145. doi:10.5539/gjhs.v8n3p139.
- Shahriari A., Sarani H., Sheikh S., Arbabisarjou A., effect of foot reflexology massage on pruritus in hemodialysis patients. *J Edu Health Promot* 2021;10:81.