JBACHS
Journal of Basic and Clinical Health Sciences

J Basic Clin Health Sci 2022, 6: 73-80
https://doi.org/10.30621/jbachs.884363
RESEARCH ARTICLE

THE EFFECT OF AROMATHERAPY AND ABDOMINAL MASSAGE APPLIED TO INFANTS ON CONSTIPATION AND MATERNAL ANXIETY LEVEL

Mehtap Metin Karaaslan[1], Duygu Arikan[2]

[1] Recep Tayyip Erdogan University, Vocational School of Health Services, Rize, Turkey
[2] Ataturk University, Nursing Faculty, Erzurum, Turkey.

Address for Correspondence: Mehtap Metin Karaaslan, **E-mail:** m.metinkaraaslan@gmail.com
Received: 21.02.2021; **Accepted:** 10.11.2021; **Available Online Date:** 27.01.2022

Cite this article as: Metin Karaaslan M, Arikan D. The Effect of Aromatherapy and Abdominal Massage Applied to Infants on Constipation and Maternal Anxiety Level. J Basic Clin Health Sci 2022; 6: 73-80.

ABSTRACT

Purpose: As constipation is a chronic and common disease, cost-effective therapies are needed. In addition, there is a limited number of studies on the aromatherapy massage and normal abdominal massage, which are the traditional and complementary applications included in the constipation management program in the literature. However, there is no study about each of these two applications being superior to the other.

Methods: The research was conducted as a quasi-experimental study between June 2018 and February 2020. The sample of the study was composed of a total of 69 infants and their parents including 23 in aromatherapy massage group, 23 in traditional massage group, and 23 in control group, who met the inclusion criteria. The data were assessed by using the personal information form, the intestinal functions assessment form, State Anxiety Inventory, and abdominal massage checklist. The data were assessed by Shapiro Wilk test, one-way analysis of variance, Kruskal Wallis test, chi-square test, and generalized linear model. The significance level was taken as $p<0.05$.

Results: It was determined that the infants' state of crying and farting during defecation was statistically significant in the aromatherapy massage group and the traditional massage group, and its effect was higher in the aromatherapy massage group ($p<0.05$). It was determined that the mothers in the aromatherapy massage group had a lower anxiety level compared to the mothers in the other groups. The lowest mean score of the state anxiety inventory was obtained in the aromatherapy group 4 weeks after the massage ($p<0.05$).

Conclusion: It was determined that the aromatherapy massage and traditional abdominal massage decreased the symptoms of the infants with constipation problems and both were effective on the mothers' anxiety level, but the effect was higher in the aromatherapy group.

Key Words: Abdominal massage, aromatherapy, mother, anxiety, constipation

INTRODUCTION

Childhood is composed of six periods, and children are assessed separately in each period based on their physical, emotional, and social developments. Excretion has an important role in the physical development of children (1). The factors such as nutrition type, environment change, drugs, febrile illnesses, and postoperative period are effective on the defecation type of infants (2). The infants fed by breast milk generally have normal excretion, but the

infants fed by baby formula may have hard excretion, or they may not be able to excrete from first weeks. Unless there is a congenital/anatomic abnormality or cow milk protein allergy, infants are not expected to have constipation within the first 4 months but starting to use formula milk after breast milk is regarded as a reason for constipation (3-5).

Constipation is defined as a rare and/or hard excretion due to the slowdown of the passage from gastrointestinal system or a disorder inthe excretion process[6]. In constipation management, the traditional and complementary therapies such as massage and essential oil are also used together with the medical treatment (7,8). Aromatherapy is a complementary health treatment that provides the therapeutic use of essential oils[9]. Essential oils are aromatic essences in oil o resin form obtained by distillation from a botanically defined plant raw material or by an appropriate mechanical method without heating (10). Lavender oil (Lavandula officinalis Chaix) of the Lamiaceae family, which has maximum and excellent absorbent properties from the skin during massage, has a soothing effect, relieves discomfort and supports immune function with its antibacterial and antifungal properties. It has sleep-regulating effects, anti-dementia effects in Alzheimer's disease, learning-accelerating effects, antispasmodic, relaxing and balancing effects (11-13). The application of essential oils on the skin through massage is defined as aromatherapy massage.

In a very limited number of studies investigating the effect of massage on constipation in the literature, it has been found that the abdominal massage applied for the patients diagnosed with constipation has reduced the severity of the gastrointestinal symptoms, increased the defecation frequency, and enhanced quality of life (14,15). In the study conducted by Moss et al on the children with mental disabilities, they found that the abdominal massage affected stool consistency but did not affect stool frequency (16). Also, parents stated the abdominal massage as a positive experience. Silva and Motta found in their study conducted on the children with constipation problems that the abdominal massage increased stool frequency and did not affect fecal incontinence (17). In their study, Nam et al applied abdominal massage with essential oils to the children with mental disabilities and revealed that the aromatherapy application may be an effective nursing intervention in eliminating constipation (18).

As constipation is a chronic and common disease, cost-effective therapies are needed. For this reason, there is a need to improve the current traditional and complementary applications and to conduct studies to make them play a more important role in the future (19). Also, the use of traditional and complementary applications has increased gradually. Therefore, there is a clear need for the guidelines and the studies with high level of evidence about the results of the traditional and complementary applications (20). In addition, there is a limited number of studies on the aromatherapy massage and normal abdominal massage, which are the traditional and complementary applications included in the constipation management program in the literature (16-18). However, there is no study about each of these two applications being superior to the other.

Constipation seen frequently in childhood is a pediatric problem that has negative physical, psychological, social and economic consequences for children, parents and society, and has a negative impact on the quality of life and family dynamics (21, 22). Also, the constipation observed in childhood is a global health problem causing stress for parents (23). But no study has been found in the literature indicating the effect of constipation on mothers. For this reason, with its findings, this study aims to determine the effect of the essential oils and traditional abdominal massage interventions on the symptoms of the infants with constipation and the mothers' anxiety.

METHODS

Study Design

The research was designed as a quasi-experimental study to determine the effect of the essential oil and traditional abdominal massage interventions on the symptoms of the constipated infants and their mothers' anxiety. The sample of the research was composed of totally 69 infants and their parents including 23 in aromatherapy massage group, 23 in traditional massage group, and 23 in control group, who applied to the family health centers for routine control between June 2018 and February 2020 and met the inclusion criteria. In order to determine whether or not the sample size was adequate, Post-hoc power analysis was performed considering f=0743 effect size and 5% error. The testing power was obtained to be 99.99% as the study was completed with 69 people.

Participants

Inclusion Criteria

- Being diagnosed with constipation through the nursing constipation diagnostic criteria and supporting the constipation diagnosis with Pediatric Rome III criteria
- Being aged between 2 and 6 months
- Being fed in a mixed way
- Being able to communicate and collaborate with the family
- Having no surgical operation history in abdominal region

Exclusion Criteria

- Having an intestinal disease
- Having allergic history or skin problems
- Having communication problem with the family

Data Collection Tools

In this study, data were collected with the following tools: the personal information form including the questions about the mothers' age and educational status, gestation week and infants' birth weight; the intestinal functions assessment form including the questions on status of crying during defecation, farting frequency etc.; the abdominal massage checklist including the rules to be obeyed by the mothers while making massage and including yes and no, and the state anxiety inventory to determine the mothers' anxiety levels.

State Anxiety Inventory

The State Anxiety Inventory, developed by Spielberger et al. in 1970 to measure the anxiety level of the individuals at and over the age of 14, is a 4-point Likert scale including 20 items which aim to determine how an individual feels at a certain time and under certain conditions. The minimum total score of the State Anxiety Scale is 20 and its maximum total score is 80. High score signifies a high anxiety level, and low score signifies a low anxiety level. The Turkish reliability study of the scale was conducted by Öner and Le Compte in 1975, and its validity study was conducted by Öner in 1977 (24). The Cronbach's Alpha value of the State Anxiety Inventory was determined to be 0.95 in the present study without considering time.

Interventions

Experimental group protocol

Lavender oil and sweet almond oil (20 cc sweet almond oil, 1 cc lavender oil), a model baby and a training booklet were used as the inventory tool in the aromatherapy massage group; on the other hand, sweet almond oil, a model baby, and a training booklet were used as the inventory tool in the traditional massage group.

The aromatic oil mixture was provided by the researcher in order to ensure that the oils that were required to be used by the participants in the aromatherapy massage group were 100% natural and to provide a full mixture. The essential oil ratio for infants is specified as 0.5% in essential oil (25). Therefore, in our study, lavender, an essential type of oil, was diluted 0.5% in sweet almond oil, another essential type of oil (20 cc sweet almond oil, 1 cc lavender oil). Lavender is non-toxic and non-irritating, clear-pale yellow oil with a calming, refreshing, and spasm dissolving effect, and can be used safely in children (25).

Pre-interviews were made in the family health centers in which the participants were determined, and appointments were taken from the mothers willing to participate. Home visits were planned for abdominal massage training. In the home visits, the definition of constipation and prior knowledge of the abdominal massage application techniques were provided with the training booklet prepared by the researcher. The abdominal massage checklist was followed by the researcher for the mothers, and the abdominal massage training was provided with the model baby. The mothers also practiced massage on the model baby. Mothers' massage performance was observed, and the training was repeated in case at least 3 items were performed incorrectly or incompletely based on the abdominal massage checklist. It was provided that the massage steps were performed completely by the mothers. The training period lasted for 30-45 minutes for each individual although it differed for each of them.

As it was recommended that massage, as a nursing intervention for constipation, should be performed every day at the same hour and regularly (26), the massage was applied 5 times a week between 9:00 and 10:00 for 8-10 minutes and for 4 weeks by the mothers. Home visits were performed three times: at the beginning, at the end of the second week, and at the end of the fourth week.

Control group protocol

Pre-interviews were made in the family health centers, where the participants were determined, appointments were arranged with the families willing

Table 1. Distribution and Comparison of the Control and Experimental Groups Based on the Socio-Demographic Characteristics of the Mothers and Infants

	Aromatherapy Massage Group		Traditional Massage Group		Control Group		Total		Test statistic	P
	X±SD		**X± SD**		**X±SD**					
Mother's age	31.5 ± 4.5		31 ± 5.6		29.3 ± 4.4				F=1.25	0.29
G.W. of the Infants*	38.2 ± 1.3		38.1 ± 1.1		38.3 ± 1.3				F=0.065	0.937
Current weight	6123.9 ± 1051.6		6673.9 ± 592.2		6089.1 ± 781.3				F=3.592	0.051
Infant's age	3.6 ± 0.9		3.8 ± 0.7		3.7 ± 0.8				F=0.695	0.503
Birth weight	3200 (2300 - 4000)		3150 (2800 - 3850)		3100 (2200 - 3700)				χ^2**=3.504	0.173
	S	%	S	%	S	%	S	%		
Educational Status										
Primary school graduate	2	8.7	2	8.7	2	8.7	6	8.7	χ^2=0.379	0.999
Secondary school graduate	3	13	3	13	4	17.4	10	14.5		
High school graduate	13	56.6	12	52.2	12	52.2	37	53.6		
University graduate	5	21.7	6	26.1	5	21.7	16	23.2		
Employment status										
Yes	3	13	5	21.7	5	21.7	13	18.8	χ^2=0.758	0.684
No	20	87	18	78.3	18	78.3	56	81.2		
History of constipation in family										
Yes	11	47.8	13	56.5	10	43.5	34	49.3	χ^2=0.812	0.666
No	12	52.2	10	43.5	13	56.5	35	50.7		
Infant's gender										
Girl	13	56.5	12	52.2	12	52.2	37	53.6	χ^2 =0.117	0.943
Boy	10	43.5	11	47.8	11	47.8	32	46.4		
Birth order										
The first	8	34.8	7	30.4	7	30.4	22	31.9	χ^2 =1.773	0.939
The second	10	43.5	12	52.3	11	47.8	33	47.8		
Three and more	5	21.7	4	17.3	5	21.8	14	20.3		

χ^2 Chi-Square Testχ^2**: Kruskal Wallis test, F: One-way Analysis of variance test, *Infant's Gestation Age

to participate in the research, and home visits were planned. No application was performed for the infants for 4 weeks. At the end of the 4th week, training was provided to each parent in the control group at their homes to provide the ethical principles.

Procedure

In order to prevent that the groups were affected from each other, the data of the intervention group were collected in one day, and the data of the control group were collected on the following day. The data collection days of the intervention and control groups were determined by drawing of lots. In order to determine the infants between the age group of 2 and 6 months and their mothers who came for checking other than the determined days, the information was controlled in the nurse card, and the infants and mothers meeting the inclusion criteria were included in the study.

Data analysis

The data were analyzed with IBM SPSS 23. The compliance to normal distribution was examined by the Shapiro Wilk test. One-way analysis of variance was used to compare the normally distributed data in terms of the massage groups. The data without normal distribution were examined by using the Kruskal Wallis test. Chi-square test was used in the examination of the categorical data based on the massage groups. The scores of the state anxiety inventory based on the group and time were examined by the generalized linear models. The analysis results were presented as mean±standard deviation for the normally distributed quantitative data

Table 2. Comparison of the Infants' States of Crying During Defecation Based on the Massage Time

	State of Crying	Before massage		2 weeks after massage		4 weeks after massage		Test Statistic	P
		S	%	S	%	S	%		
Aromatherapy Massage Group	Yes	21	91.3	10	43.5	1	4.3	χ^2 =35.083	**<0.001***
	No	2	8.7	13	56.5	22	95.7		
Traditional Massage Group	Yes	18	78.3	11	47.8	2	8.7	χ^2 =22.610	**<0.001***
	No	5	21.7	12	52.2	21	91.3		
Control Group	Yes	23	100	23	100	21	91.3	χ^2 =4.119	0.127
	No		---		---	2	8.7		

χ^2:Chi-square test

and as median (min-max) for the data without normal distribution. The categorical data were expressed as frequency. The significance level was taken as $p<0.05$

Ethical consiredations

The data of the study were collected on a voluntary basis after obtaining the ethical committee approval and the legal permissions from the institutions where the study would be conducted. Before collecting data, the parents were informed about the study, and the consent of the families were obtained.

RESULTS

There was no statistically significant difference between the distributions of socio-demographic characteristics of the mothers and the infants in the aromatherapy massage group, traditional massage group, and control group ($p>0.05$). It was also determined that all the three groups were homogeneous (Table 1). As a result of the analysis, it was found that the infants in all the groups were anxious.

It was determined that the infants' state of crying during defecation had a significant difference based on time in the aromatherapy and traditional massage groups ($p<0.05$) (Table 2). It was found that the state of farting had a difference based on time in the aromatherapy massage and traditional massage groups ($p<0.05$) (Table 3).

The findings showed that in all the groups, the mean scores of the state anxiety inventory before the massage had no difference ($p<0.05$) (Table 4). When examining the mean scores of the state anxiety inventory of all the three groups without the effect of time, the state anxiety inventory mean score of the mothers was obtained to be 48.00 in the aromatherapy group, 55.03 in the abdominal massage group, and 65.65 in the control group. It was determined that the mothers in the aromatherapy massage group had a lower anxiety level compared to the mothers in the other groups ($p<0.05$) (Table 4). The analysis results indicated that the effect of time on the mean scores of the state anxiety inventory without the effect of the groups was statistically significant ($p<0.05$). The mean score of the state anxiety inventory before the massage was 67.62, the mean score two weeks after the massage was 57.52, and the mean score 4 weeks after the massage was 43.54. The lowest mean score of the state anxiety inventory was obtained 4 weeks after the massage (Table 4).

The mean scores of the state anxiety inventory in the aromatherapy group 2 weeks and 4 weeks after the massage were different from all the group and time interactions. The lowest mean score of the state anxiety inventory was obtained in the aromatherapy group 4 weeks after the massage ($p<0.05$) (Table 4).

DISCUSSION

The fact that crying in the aromatherapy massage group and traditional massage group decreased as long as massage was made indicated that the infants' symptoms decreased. Both experimental groups were statistically different, 91.3% of the infants cried before the aromatherapy massage, and 78.3% of the infants cried before the traditional massage. Crying was observed in 43% of the infants in the aromatherapy massage group and in 47.8% of the infants in the traditional massage group two weeks after the massage. Crying was observed in 4.3% of the infants in the aromatherapy massage group and in 8.7% of the infants in the traditional massage group 4 weeks after the massage. This indicated that the aromatherapy massage was more effective in the infants' state of crying. Nam et al revealed that the

aromatherapy application may be an effective intervention in eliminating constipation (18). The abdominal massage made feces be pushed from intestines. It was considered that feces were pushed from the intestines more powerfully with the aromatherapy abdominal massage combining with the antispasmodic effect of lavender.

As a result of this study, it was concluded that while the status of farting had a difference based on time in the aromatherapy massage and traditional massage groups ($p<0.05$), it did not change in the control group ($p>0.05$). It was determined that 65.2% of the infants in the aromatherapy group farted rarely before the massage, 56.5% farted often 2 weeks after the massage and 95.7% farted often 4 weeks after the massage; on the other hand, 60.9% of the infants in the traditional massage group farted rarely before the massage,52.2 % farted often 2 weeks after the massage, and 91.3 farted often 4 weeks after the massage. This situation proved that massage decreased abdominal distension. The fact that farting frequency was higher in the aromatherapy massage group compared to the traditional massage group indicated that there was a difference between the aromatherapy and abdominal massage in terms of the effect on constipation. The studies supporting the results of the present study were found in the literature. In the study conducted by Preece, it was determined that the abdominal massage applied for 6 weeks and for 5 days decreased gas and distension (27). In the study conducted by Ayaş et al with the patients with spinal cord injury, they reported that the abdominal massage applied for 15 minutes for 2 weeks decreased the abdominal distension (28). This situation indicated that including massage and aromatherapy massage in the field of pediatric nursing will be useful.

Infants may cry due to reasons other than diseases such as hunger, willing to be hugged, being cold, noise as well as many medical reasons threatening or not threatening life. Infants' crying, which mostly worries parents, is among the reasons for applying to hospitals. Also, it may cause anxiety for the parents who cannot understand the reason for crying and cannot know how to behave (29). In their study, Stock et al.[30] reported that the mothers, who took their infants to emergency as they had cried, had more postnatal depression. Akman et al determined that the mothers of the infants with colic problems in the postpartum period had high state anxiety levels (31). When considering that the infants were anxious in all the groups, constipation may cause anxiety in parents. It was observed in the present study that the abdominal massage applied for the infants in both experimental groups without the time factor was effective on the mothers' anxiety level but the anxiety level decreased more in the aromatherapy group. The lowest anxiety mean score was observed in the aromatherapy group 4 weeks after the massage. Similarly, Lai et al demonstrated that the aromatherapy application improved bowel movements and enhanced the quality of life significantly (32).

Table 3. Examination of the Effect of the Massage Time on the Farting Frequency of the Infants

Group	Farting frequency	Before massage		2 weeks after massage		4 weeks after massage		Test Statistic	P
		S	%	S	%	S	%		
Aromatherapy Massage Group	Rare	15	65.2	1	4.3		---	χ^2=50.221	**<0.001***
	Sometimes	4	17.4	9	39.1		---		
	Mostly	4	17.4	13	56.5	22	95.7		
	Always		---		---	1	4.3		
Traditional Massage Group	Rare	14	60.9		---		---	χ^2=53.000	**<0.001***
	Sometimes	6	26.1	10	43.5		---		
	Mostly	3	13	12	52.2	21	91.3		
	Always		---	1	4.3	2	8.7		
Control Group	Rare	7	30.4	6	26.1	1	4.3	χ^2=7.000	0.136
	Sometimes	14	60.9	12	52.2	16	69.6		
	Mostly	2	8.7	5	21.7	6	26.1		

χ^2: Chi-square test

Table 4. Comparison of the State Anxiety Inventory Scores of the Groups Based on Time

	Aromatherapy Massage	Traditional Massage	Control Group	Total Score	Test statistic**	P
Before massage	65,96 ± 6.70^{A}	69.61 ± 5.07^{A}	67.30 ± 4.07^{A}	**67.62 ± 5.53**	F=2.698	0.075
2 weeks after massage	48.52 ± 7.90^{aB}	58.04 ± 7.04^{bB}	66.00 ± 4.97^{cB}	**57.52 ± 9.80**	F=38.687	**<0.001**
4 weeks after massage	29.52 ± 4.71^{aC}	37.43 ± 6.12^{bC}	63.65 ± 5.25^{cB}	**43.54 ± 15.62**	F=252.505	**<0.001**
Total Score	**48.00 ± 16.33**	**55.03 ± 14.7**	**65.65 ± 4.96**			
Test statistic*	F=257.894	F=295.330	F=8.671			
p	**<0.001**	**<0.001**	**<0.001**			

a-c: There is no significant difference between the groups with the same letter in each period of time. A-C: Within the group, there is no significant difference between the times with the same letter, *One-way analysis of variance, **Repeated analysis of variance

CONCLUSION

The fact that infants cannot express themselves and their mothers cannot do anything for their infants can affect them psychologically. For this reason, the symptoms should be eliminated and alleviated. In alleviating the symptoms, it is recommended to include the abdominal massage performed with lavender oil and the traditional abdominal massage in the nursing practices.

**This study was prepared using TREND Statement Checklist (33).

Acknowledgments: Thanks to all mothers who agreed to participate in the study.

Author contiributions: M.M.K. and D.A. contributed to the conception and design of this study. M.M.K.carried out the data collection process, performed the statistical analysis and drafted the manuscript. D.A. critically reviewed the manuscript and supervised the whole study process. All authors read and approved the final manuscript.

Conflicts of Interest: No conflict of interest has been declared by the authors.

Ethical approval: For this study, permission had obtained from the ethics committee of Atatürk University Nursing Faculty with the date 11.06.2018 and the number 2018-5/3.

Funding: No financial support was received for the study.

Peer review: Externally peer reviewed.

REFERENCES

1. Arikan D, Çelebioğlu A, Tüfekçi FG. Çocukluk döneminde büyüme ve gelişme. Içinde: Conk Z, Başbakkal Z, Yilmaz HB, Bolışık B (Editors). Pediatri Hemşireliği, Ankara: Akademisyen Tip Kitap Evi, 2013; p66.
2. Sökücü S. Çocuklarda kabızlık ve enkoprezis. İçinde: Ekşi A (Editor). Ben Hasta Değilim Çocuk Sağlığı ve Hastalıklarının Psikososyal Yönü, İstanbul: Nobel tıp kitapevleri, 2011; p435.
3. Sökücü S, Sindirim sistemi ve hastalıkları, çocuklarda sindirim sisteminin özellikleri. İçinde: Neyzi O, Ertuğrul T (Editors). Pediyatri, Istanbul: Nobel Tıp Kitap Evleri, 2010; p895..
4. Kutlu T. Fonksiyonel bağırsak hastalıkları, Türkiye Klinikleri J Pediatr Sci 2007;3:1-9.
5. Howarth LJ, Sullivan PB. Management of chronic constipation in children. Paediatrics and Child Health 2016;26:415–422.
6. Sökücü S, Saner G, Durmaz Ö. Sindirim sistemi ve hastalıkları, semptomatoloji. İçinde: Neyzi O, Ertuğrul T (Editors). Pediyatri, Istanbul: Nobel Tıp Kitap Evleri, 2010; p912..
7. Moquin B, Blackman MR, Mitty E, Flores S. Complementary and alternative medicine. Geriatric Nursing 2016,30:196–203.
8. Gnatta JR, Kurebayashi LFS, Turrini RNT, Da Silva MJP. Aromatherapy and nursing: historical and theoretical conception. Revista Da Escola De Enfermagem 2016;50:127–133.
9. Johnson K, West T, Diana S, Todd J, Haynes B, Bernhardt J, Johnson R. Use of aromatherapy to promote a therapeutic nurse environment. Intensive and Critical Care Nursing 2017;40:18–25.
10. El Asbahani A, Miladi K, Badri W, Sala M, Addi E.H.A, Casabianca H, El Mousadik A, Hartmann D, Jilale A, Renaud F.N.R. et al. Essential oils: From extraction to encapsulation. Int J Pharm 2015;483:220–243.
11. Ali B, Al-Wabel NA, Shams S, Ahamad A, Khan SA, Anwar F. Essential oils used in aromatherapy: A systemic review. Asian Pacific Journal of Tropical Biomedicine 2015;5:601–611.
12. Manion CR, Widder RM. Essentials of essential oils. American Journal of Health-System Pharmacy 2017;74:E153–E162.

13. Reis D, Jones T. Aromatherapy: Using essential oils as a supportive therapy. Clinical Journal of Oncology Nursing 2017;21:16–19.
14. Turan N, Astı TA. The effect of abdominal massage on constipation and quality of life, Gastroenterology Nursing 2016;39:48-59.
15. Lamas K, Lindholm L, Stenlund H, Engstrom B, Jacobsson C. Effects of abdominal massage in management of constipation - A randomized controlled trial. International Journal of Nursing Studies 2009;46:759–767
16. 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 2007;36: 102–108.
17. Silva CAG, Motta MEFA. The use of abdominal muscle training, breathing exercises and abdominal massage to treat paediatric chronic functional constipation. The Association of Coloproctology of Great Britain and Ireland. 2013;15: e250–e255.
18. 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;43:247-255.
19. Wang X, Yin J. Complementary and alternative therapies for chronic constipation. Evidence-Based Complementary and Alternative Medicine 2015;2015:396396
20. National Collaborating Centre for Women‘s and Children‘s Health, Constipation in children and young people: diagnosis and management of idiopathic childhood constipation in primary and secondary care, 2010, London.
21. Chan MF, Chan YL. Investigating factors associated with functional constipation of primary school children in hong kong. Journal of Clinical Nursing 2010;19:3390–3400.
22. Olaru C, Diaconescu S, Gimiga N, Tataranu E, Lacatus A, Burlea M. Diagnosis and management in chronic constipation in children age (Part II). Revista Românå De Pediatrie 2013;62:263–266.
23. Ferrara LR. Constipation in children: Diagnosis, treatment, and prevention. The Nurse Practitioner 2011;42:31–34.
24. Öner N, Le Compte A. Durumluluk Sürekli Kaygı Envanteri El Kitabı, İstanbul: Boğaziçi Üniversitesi Yayınları, 1985: p333.
25. Ayçeman, N. Aromaterapi: Doğanın şifalı dokunuşu. Konya: İnci Ofset, 2008.
26. Carpenito- moyet LJ, Handbook of nursing diagnosis. Çeviri: Erdemir F. hemşirelik tanıları. İstanbul: Nobel tıp kitapevi, 2012; p281-286.
27. Preece J. Introducing abdominal massage in palliative care for the relief of constipation. Complementary Therapies İn Nursing And Midwifery 2002;8:101–105.
28. Ayas S, Leblebici B, Sozay S, Bayramoglu M, Niron EA. The effect of abdominal massage on bowel function in patients with spinal cord injury. Am J Phys Med Rehabil 2006;85:951-955.
29. Baykan Z, Kondolot M, Baykan A. Sağlıklı bebeklerde yaşamın ilk dört ayında ağlama davranışı, ailelerin ağlamaya yaklaşımları ve bebeklerini sarsma durumları, Türkiye Çocuk Hastalıkları Dergisi 2017;3:159-164.
30. Stock A, Chin L, Babl FE, Bevan CA, Donath S, Jordan B. Postnatal depression in mothers bringing infants to the emergency department. Archives of Disease in Childhood 2013;98:36- 40.
31. Akman I, Kusçu K, Ozdemir N, Yurdakul Z, Solakoglu M, Orhan L, Karabekiroglu A, Ozek E. Mothers' Postpartum Psychological Adjustment and Infantile Colic, Archives of Disease in Childhood 2006;91:417-419.
32. Lai TKT, Cheung MC, Lo CK, Ng KL, Fung YH, Tong M, Yau CC. Effectiveness of aroma massage on advanced cancer patients with constipation: A pilot study. Complementary Therapies in Clinical Practice 2011;17(1):37-43.
33. Des Jarlais DC, Lyles C. Crepaz N, The Trend Group. Improving the reporting quality of nonrandomized evaluations of behavioral and public health interventions: The TREND statement. American Journal of Public Health 2004;94:361-366.