

Original Article

The Effect of Aromatherapy Inhalation on Fatigue Level in Individuals Undergoing Hemodialysis Therapy

Sevil Bicer, PhD

Assistant Professor, Erciyes University, Department of Nursing, Faculty of Health Sciences, Central Campus, Melikgazi, Kayseri, Turkey

Gokce Demir, PhD

Assistant Professor, Ahi Evran Universitesi Saglik Yuksekokulu, Kirsehir, Turkey

Correspondence: Assistant Professor, Sevil Bicer Erciyes University, Department of Nursing, Faculty of Health Sciences, Central Campus / 38039 Melikgazi – Kayseri, Turkey
E-mail: sevilnurse@mynet.com, sevilbicer@erciyes.edu.tr

Abstract

Background: Earlier research indicates that human beings after suffering often go through personal changes and dedicate to themselves a greater understanding of life.

Aims: The aim of this study is to uncover the deeper dimensions in the understanding of life that the human being may dedicate to herself or himself after having lived through suffering. The research question is: what existential changes and deeper dimensions in the understanding of life may the human being dedicate to herself or himself after having lived through suffering?

Methodology: A hermeneutical approach is used in this study. The material was collected through focused interviews with ten adults who had lived through personal suffering. The texts were interpreted through hermeneutical reading. Participation in the study, data storage and handling for research purposes were approved by the participants when they provided their informed consent. Permission to conduct the study was granted by an ethical committee.

Results: The results show that human beings experience deeper gratitude, wisdom and meaning in life after suffering. Human beings show greater empathy and acceptance of others. The courage to create well-being is strengthened since they attain a greater awareness of their inner source of strength. Living in the present becomes important at the same time as a greater awareness of life's fragility and finiteness evolves.

Conclusion: After having lived through suffering the human being has potential to grow and gain deeper gratitude in life thanks to a deeper awareness of the existential dimensions. The human being gains greater empathy and understanding of suffering. Further research should focus on uncovering the existential fragility that emerged as an interesting aspect in this study that adults experience after suffering.

Keywords: suffering, existential issues, gratitude, meaning in life, well-being, quality of life, interviews, hermeneutical reading

Introduction

Renal replacement therapies (RRTs) such as peritoneal dialysis (PD), hemodialysis (HD), and renal transplantation have been administered to individuals with chronic renal failure (CRF), (Levy et al., 2004; Yalcin, & Akpolat, 2000). It is tried to provide a more comfortable and longer life for the patients with CRF by mostly administering HD in their treatment (Nissenson, & Fine, 2004; Sever, 1997). Despite the improvements in hemodialysis therapy, complications, which have non-ignorable frequency and are important at the extent to be life threatening, also emerge. When literature is

examined, fatigue is found to be among the most frequent chronic complications affecting daily living function and quality of life in individuals with CRF (Murtagh et al., 2007; Williams et al., 2007; Liu, 2006; Yurtsever, & Beduk, 2003).

Previously studies (Bassolla et al., 2009; Mollaoglu, 2009; Chang et al., 2001) revealed that 71% of patients (ranging between 12% - 97%) undergoing HD developed fatigue, this condition caused limitations in daily and social life activities of individual, thus considerably affected quality of life. Fatigue develops in patients, undergoing HD, depending on factors such as accumulation of waste products (urea,

uric acid, creatine) in the body, blood pressure changes, excessive ultrafiltration rate, staying at the same position for a long time during dialysis, fluid-electrolyte disturbances, hematopoietic (anemia), disturbance in metabolic and endocrine functions, and psychological reasons (Akyol et al., 2011; Bassolla et al., 2009; Lee et al., 2007; Chang et al., 2001).

Fatigue negatively affects working, making use of spare times, nutritional habits, sexual activity, getting pleasure out of life, and family and friend relationships of patients undergoing HD. Fatigue is an important problem concerning health care team because it has negative effects on individuals in terms of physical, social, and psychological aspects (Tsay, 2004). In order to prevent fatigue symptom to affect individuals negatively, it is possible to cope with this symptom efficiently by assessing the fatigue and planning activities appropriate to individual.

Numerous complementary-supportive therapy administrations can be performed in order to minimize fatigue levels of patients undergoing hemodialysis. Among these administrations; yoga, massage, energy therapy, music, reflexology, acupuncture, acupressure are given as examples (Eglence et al., 2013; Akca et al., 2013; Mustain et al., 2007; Mitchell, & Berger, 2006; Tsay, 2004; Tracy, & Lindquist, 2003). One of the non-pharmacological methods is aromatherapy administration. There are studies indicating that aromatherapy administration in renal diseases is effective on control of numerous symptoms such as fatigue, insomnia, uremic pruritus, anxiety, stress (Shahgloian et al., 2010; Hsu et al., 2009; Kang, & Kim, 2008; Ro et al., 2002; Itai et al., 2000).

A study showing the effect of aromatherapy on control of fatigue symptoms of individuals receiving dialysis treatment has not been encountered in Turkey. Therefore, this study was conducted in order to determine the effect of aromatherapy, performed through inhalation, on fatigue level in individuals undergoing HD therapy.

Methods

Study Design

This study was a randomized controlled study conducted in order to determine the effect of aromatherapy, performed through inhalation for five minutes and three times a week, on fatigue

level in individuals, undergoing hemodialysis therapy.

Sample

The population of the study consisted of 105 patients undergoing hemodialysis therapy in a private hemodialysis center. The study was completed with 50 patients because totally 60 patients meeting inclusion criteria were reached during the study, five patients did not agree to participate in the study, two patients went out of city during follow-up, three patients in the placebo group did not want to continue the study. The data of the study were analyzed by using minitab program power analysis method and the power was found as 0.91 at alpha 0.05 confidence level. The study was conducted between 01.01.2013 and 01.03.2013. Individuals who were aged 18 years and over, were undergoing hemodialysis therapy for at least three months, who were undergoing hemodialysis of three sessions in a week, obtaining 3 and higher VAS fatigue score, were non-allergic to aromatic oils, had no diagnosis of chronic obstructive pulmonary disease, had no condition obstructing to smell, and agreed to participate in study were included in the study. By drawing lots, it was determined whether patients meeting inclusion criteria, in morning and afternoon session groups, were in the intervention group or in the placebo group and from which group study design would be started. As a result of drawing lots, individuals undergoing hemodialysis therapy in the morning were included in the control group; whereas, those undergoing hemodialysis therapy in the afternoon were included in the intervention group.

Instruments

The data of the study were collected by using Patient Information Form, VAS Fatigue Scale, and Brief Fatigue Inventory. Lavender and rosemary aromatherapy oils were also utilized during the aromatherapy. The researchers participated in “Acupressure and Aromatherapy Course” including 24-hour theoretical education and practice in this study.

“Socio-demographic characteristics” and “disease and treatment-related information” were involved in patient information form developed by the researchers in line with literature.

In the study, fatigue was assessed by using VAS on which numbers from 0 to 10 were placed at equal intervals on a 10-cm horizontal line. The

patients were asked to mark the number that reflected their fatigue and '10' indicated the presence of the most severe fatigue.

Turkish validity and reliability study of “Brief Fatigue Inventory (BFI)”, developed by Mendoza et al., (1999) and consisting of 10 items, was conducted by Cinar et al., (2000) and its internal consistency coefficient (Cronbach's alpha value) was determined as 0.98. Cronbach's alpha of BFI in the present study was found as 0.93 before the intervention and 0.95 after the intervention. BFI shows general fatigue levels (fatigue felt at the moment of the interview, general fatigue experienced in last 24 hours, and the most severe fatigue experienced in the last 24 hours) of individuals. Scoring ranges from “0” to “10”; while “0” signifies no fatigue, “10” signifies the worst fatigue. As it is possible to assess each item in BFI individually, general fatigue level and effect level of activities can be also determined by calculating total score. Score of each item is maximum 10 points, general fatigue level (including 10 items) is maximum 90 points, and effect level of activities (including 6 items) is maximum 60 points. In the study, assessment of fatigue was made over obtained total score.

Data Collection

Administrations performed to Intervention Group

Patient information form, VAS Fatigue Scale, and BFI were applied to patients included in the intervention group at the first follow up (the first interview- before aromatherapy administration). The forms were filled by conducting face-to-face interview with the patients. Lavender and rosemary oils were then applied to all the patients, included in the intervention group, by the researcher at the last hour of every dialysis session in totally three sessions as three times for one week (each session took 5 minutes) in accordance with protocol of aromatherapy inhalation administration. At the end of the administration, VAS Fatigue Scale and BFI were applied to the patients again.

Protocol of Aromatherapy Inhalation Administration

Aromatic oils given to the individuals in the intervention group were 100% pure and supplied from Awe-Cemre company. Oils in 3:3 ratio from lavender and rosemary essential oils were used in the mixture prepared. The oils were kept

in 10 ml, dark colored, light-proof, dropper glass bottle.

After 200 cc of boiled water was poured into a bowl, 3 drops of lavender and rosemary oils were dripped in it and the patients were inhaled from an approximately 30-cm distance for 5 minutes. The patients were completely covered with a cloth. In the meantime, the patients were asked to close their eyes completely and to inhale deeply. Before the administration to the individuals in the intervention group, 0,1 ml of aromatherapy oil was applied to inner surface of forearm at the first follow-up and it was tested whether or not any allergic reaction developed such as redness, pruritus, rash on the administration zone after 24 hours.

Administrations performed to Placebo Group

The data of the patients in the placebo group were collected by researchers using face-to-face interview technique. Patient information form, VAS Fatigue Scale, and BFI were applied at the first follow-up of the patients. Because of having no therapeutic value, inhalation of sunflower oil, was then applied to all the patients, included in the intervention group, by the researcher at the last hour of every dialysis session in totally three sessions as three times for one week (each session took 5 minutes) in accordance with protocol of aromatherapy inhalation administration. VAS Fatigue Scale and BFI were applied to the individuals again at the end of the administration.

Data Analysis

The data obtained from study were analyzed by using SPSS 16.0 packaged software on the computer. Normal distribution of the data were tested by Shapiro-Wilk and Kolmogorov-Smirnov tests and parametrical tests were used because the data showed normal distribution. The data of the groups indicated as number and percentage were examined via chi-square test in order to see the difference between the groups. Student t test was used for mean scores of VAS fatigue and brief fatigue inventory according to individual follow-up of the patients in the intervention and control groups. In comparisons, the value of $p < 0.05$ was accepted as statistically significant.

Ethics

Ethics Committee Approval from Non-invasive Trials Ethics Committee Unit of a University and

institutional approval from hemodialysis center where the study was conducted and informed volunteer consent from the patients were obtained in order to conduct the study.

Results

It was found that 60% of the individuals in the intervention group were female, 40% were aged 60 years and over, 52% were primary school graduate, 84% were married, 56% had income equal to expense, 60% had extended family, and 60% were residing in the city center. 80% of the individuals in the placebo group were male, 36% were aged 60 years and over, 76% were primary school graduate, 84% were married, 64% had income equal to expense, 88% had nuclear family, and 52% were residing in the city center. Intervention and control groups were similar in terms of other socio-demographic characteristics except for educational status (Table 1, $p > 0.05$).

It was found that 36% of the individuals in the intervention group had chronic renal failure due to glomerulonephritis and 40% were undergoing hemodialysis for 24-35 months. 52% of the individuals in the placebo group had chronic renal failure due to Hypertensive arteriosclerosis and 48% were undergoing hemodialysis for 12-23 months (Table 2).

After aromatherapy administration through inhalation three times a week, BFI mean score of the individuals in the intervention group decreased from 42.92 ± 13.23 to 19.52 ± 6.7 and their VAS fatigue mean score from 7.16 ± 1.54 to 3.04 ± 1.39 for every dialysis session (Table 3, $p < 0.05$).

It was determined that while BFI mean score was 46.32 ± 10.56 and VAS fatigue mean score was 7.56 ± 1.08 for the individuals in the placebo group at the first follow-up, their BFI mean score was 45.08 ± 11.88 and their VAS fatigue mean score was 6.60 ± 1.25 at the second follow-up (Table 3, $p > 0.05$).

Whilst the difference between the groups in terms of BFI and VAS fatigue mean scores was not significant at the first follow-up; it was significant in especially intervention group at the second follow-up (Table 3, $p < 0.05$).

Discussion

It is possible to cope with fatigue symptom efficiently by assessing fatigue and planning interventions appropriate to individual in order to prevent this symptom to negatively affect

individuals undergoing hemodialysis therapy.

Numerous studies have revealed that aromatherapy performed by nurses to patients undergoing hemodialysis is important for fatigue management and symptoms decrease (Ro et al., 2007; Tsay, 2004; Itai et al., 2000). Lee et al., (2007)

divided 34 patients, undergoing dialysis treatment, into two groups, scent group ($n=17$) and control group ($n=17$). The group inhaled lavender and sweet orange oil for 2 minutes three times for one week and as a result of the study, it was determined that insomnia and fatigue levels of the patients decreased.

In the study of Itai et al. (2000), rooms of 14 hemodialysis patients, who were chosen as both experimental and control group were changed at one week intervals, an odorless substance in the first week, lavender oil in the second week, and hiba oil in the third week were sprayed in patients' rooms two times a day and it was determined that their depression, anxiety, and fatigue levels decreased and psychological well-being increased in the week when lavender oil and hiba oil were sprayed.

In the study conducted by Kang and Kim on 50 patients undergoing hemodialysis as experimental group ($n=28$) and control group ($n=30$), they prepared a mixture in which lavender, daisy, and geranium oils were diluted in ratio of 4: 4: 2 with sweet almond oil of 100 ml and applied a hand massage to experimental group for 5 minutes 12 times. Stress and fatigue levels after the administration were determined to decrease considerably in experimental group compared to pre-administration (Kang, & Kim, 2008). When related studies were examined, there is no randomized controlled study.

Results of limited number of studies assessing the effect of aromatherapy applied to patients, undergoing hemodialysis, on fatigue levels are also similar to results of the present study. Previous studies indicated that aromatherapy performed to individuals with fatigue affected their quality of life positively by decreasing fatigue level.

In addition, there are also studies indicating that aromatherapy administration relieves uremic pruritus of patients undergoing hemodialysis (Kang, & Kim, 2008; Ro et al., 2002; Shahgloian et al., 2010), decreases pain experienced following inserting of needle into fistula (Nesami et al. 2014) and headache (Bicer et al. 2015),

improves the quality of sleep (Ltyle et al., 2014), and regulates vital signs during hemodialysis decreases anxiety level (Dewi, & Putra, 2013), (Ltyle et al., 2014).

Table 1. Distribution of Socio-Demographic Characteristics of the Individuals in the Intervention and Placebo Groups

Descriptive Characteristics	Groups			
	Aromaterapi (n= 25)		Plasebo (n=25)	
	n	%	n	%
Gender				
Female	15	60.0	7	28.0
Male	10	40.0	18	72.0
$x^2=5.201$ $p=0.74$				
Age Groups				
30-39 years	3	12.0	3	12.0
40-49 years	4	16.0	8	32.0
50-59 years	8	32.0	6	24.0
60 years and above	10	40.0	8	32.0
$x^2=3.692$ $p=0.718$				
Educational level				
Illiterate	10	40.0	2	8.0
Primary School	13	52.0	19	76.0
High School	2	8.0	4	16.0
$x^2=18.67$ $p=0.017$				
Marital Status				
Single	4	16.0	5	20.0
Married	21	84.0	20	80.0
$x^2=0.754$ $p=0.686$				
Income Status				
Low	6	24.0	7	28.0
Middle	14	56.0	17	68.0
High	5	20.0	1	4.0
$x^2=9.63$ $p=0.057$				
Living place				
City	15	60.0	12	48.0
Village - town	10	40.0	13	52.0
$x^2=0.767$ $p=0.681$				

Table 2. Distribution of Medical Characteristics of the Individuals in the Intervention and Placebo Groups

Medicinal properties	Groups			
	Intervention Group (n= 25)		Placebo Group (n=25)	
	n	%	n	%
Reason of Chronic renal failure				
Glomerulonephritis	9	36.0	6	24.0
Diabetic Nephropathy	5	20.0	2	8.0
Cystic Kidney Disease	2	8.0	3	12.0
Hypertensive Nephrosclerosis	9	36.0	14	56.0
				$x^2=13.903$
				$p=0.084$
Duration of hemodialysis				
6 – 12 month	5	20.0	0	0.0
13-24 month	6	24.0	11	44.0
25-36 month	10	40.0	12	48.0
37 month and above	4	16.0	2	8.0
				$x^2=17.25$
				$p=0.17$

Table 3. Comparison of Pre-and Post- Administration Fatigue Inventory and VAS Fatigue Mean Scores for Individuals in the Intervention and Placebo Groups

Groups	Fatigue Inventory		<i>p</i>	VAS Fatigue		<i>p</i>
	Pre-intervention ($\bar{x} \pm SS$)	Post-intervention ($\bar{x} \pm SS$)		Pre-intervention ($\bar{x} \pm SS$)	Post-intervention ($\bar{x} \pm SS$)	
Intervention Group (n=25)	42.92±13.23	19.52±6.7	0.001	7.16±1.34	3.04±1.39	0.002
Placebo Group (n=25)	46.32±10.56	45.08±11.88	0.713	7.56±1.08	6.60±1.25	0.554
F	0.567	58.72		2.047	57.75	
<i>p</i>	0.570	0.000		0.137	0.000	

Various substances found in essential oils used in aromatherapy have psychological, physical, and cellular effects by getting into bloodstream via inhalation or topical administration.

When literature is examined, it is observed that they are not involved enough in nursing interventions in hemodialysis units even though aromatherapy administrations have so many positive effects on patients undergoing hemodialysis. Making interventions to include complementary treatment methods like aromatherapy in standard nursing practices in hemodialysis units and extending the use of aromatherapy are thought to be required.

Conclusions

It was determined that aromatherapy inhalation significantly decreased the severity of fatigue in patients undergoing hemodialysis therapy and was an easy-to-use and economical administration applied by nurses easily and without adverse effects.

In line with these results; it can be recommended to extend the use of aromatherapy by informing hemodialysis nurses about CAM practices and for nurses trained about this issue to conduct randomized controlled studies in larger sample group and different aromatic oils in order to support results of the study.

Acknowledgements

Researchers would like to thank all hemodialysis patients participating in the study and Esteemed Academician Özkan Sarıkaya who contributed to assessment of statistical analysis of the study's results.

References

- Akca, K. N., Tasci, S. & Karatas, N. (2013) Effect of acupressure on patients in Turkey receiving hemodialysis treatment for uremic pruritus. *Alternative Therapies in Health and Medicine Sep-Oct; 19: 12-18.*
- Akyol, A., Yildirim, Y., Toker, E. & Yavuz B. (2011) The use of complementary and alternative medicine among chronic renal failure patients. *Journal of Clinical Nursing 7-8: 1035-1043.*
- Bassolla, M., Luciani, G. & Tazza, L. (2009) Fatigue and its correlates in chronic hemodialysis patients. *Blood Purification 28: 245-252.*
- Bicer, S., Unsal, A. & Demir, G. (2015) The Effect of Aromatherapy massage applied to facial area upon headache severity among patients who suffered from headache during hemodialysis. *International Journal of Caring Sciences September-December 3: 722-728.*
- Chang, W. K., Hung, K. Y., Huang, J. Y., Wu, K.D. Tsai, T. J. (2001) Chronic fatigue in longterm peritoneal dialysis patients. *American Journal of Nephrology 21: 479-485.*
- Cinar, S., Sezerli, M., Sarsmaz, N. & Menten, A. Ö. (2000) May hemodialysis cause acute fatigue syndrome? *Nursing Forum 3: 28-33.*
- Dabirian, A., Sadeghi, M., Mojab, F. Talebi, A. (2013) The effect of lavender aromatherapy on sleep quality in hemodialysis patients. *Journal of Nursing and Midwifery 79: 1-8.*
- Dewi, N. & Putra, P. P. (2013) The effect of inhalation aromatherapy on decrease anxiety levels of patients with chronic renal failure undergoing hemodialysis in Wangaya District Hospital. *Community of Publishing in Nursing 1: 24-30.*
- Eglence, R., Karatas, N. & Tasci, S. (2013) The effect of acupressure on the level of fatigue in hemodialysis patients. *Alternative Therapies in Health and Medicine Sep-Oct; 19: 19-27.*
- Hsu, M.C., Chen, H.W., Hwu, Y.J. & et al. (2009) Effects of thermal therapy on uremic pruritus and biochemical parameters in patients having haemodialysis. *Journal of Advanced Nursing 65: 2397-2410.*
- Itai, T., Amayasu, H., Kuribayashi, M. Kawamura N, Okada M, Momose A, Tateyama T, Narumi K, Uematsu W, Kaneko S. (2000) Physiological Effects of aromatherapy on chronic hemodialysis patients. *Phychiatry and clinical neurosciences 54: 393-397.*
- Kang, S. J. & Kim, N. Y. (2008) The effects of aroma hand massage on pruritus, fatigue and stress of hemodialysis patients. *J Korean Acad Adult Nurs 6:883-894.*
- Lee, B. O., Lin, C. C., Chaboyer, W., Chiang, C. L. Hung, C. C. (2007) The fatigue experience of hemodialysis patients in Taiwan. *Journal of Clinical Nursing 16: 407-413.*
- Levy, J., Morgan, J. & Brown, E. (2004) *Oxford Handbook of Dialysis.* Nobel Medical Bookstore, İstanbul, pp 6-12.
- Liu, H. E. (2006) Fatigue and associated factors in hemodialysis patients in Taiwan. *Research in Nursing & Health 29: 40-50.*
- Lytle, J., Mwatha, C. & Davis, K. K. (2014) Effect of lavender aromatherapy on vital signs and perceived quality of sleep in the intermediate care unit: A pilot study. *American Journal of Critical Care 1: 24-29*
- Mendoza, T. R., Wang, X. S., Cleeland, C. S., Morrissey, M., Johnson, B. A., Wendt, J. K. & Huber, S. L. The rapid assessment of fatigue severity in cancer patients, use of brief fatigue inventory. *Cancer 1999; 85: 1186-1196.*
- Mitchell, S. A. & Berger, A. M. (2006) Cancer-related fatigue: The evidence base for assessment and management. *Cancer J 12: 374-387.*
- Mollaoglu M. (2009) Fatigue in people undergoing hemodialysis. *Dialysis & Transplantation 38: 216-220.*
- Murtagh Fliss, E. M., Addington-Hall, J. Higginson, I. J. (2007) The prevalence of symptoms in end-stage renal disease: A systematic review. *Advances in Chronic Kidney Disease 14: 82-99.*
- Mustain, K.M., Morrow, G.R., Carroll, J.K. Figueroa-Moseley CD, Jean-Pierre P, Williams GC. (2007) Integrative nonpharmacologic behavioral interventions for the management of cancer-related fatigue. *The Oncologist 12: 52-67.*
- Nesami, M. B., Espahbodi, F., Nikkhal, A., Shorofi, S. A. Charati, J. Y. (2014) The effects of lavender aromatherapy on pain following needle insertion into a fistula in hemodialysis patients. *Complementary Therapies in Clinical Practice 1: 1-4*
- Nissenson, A. R. & Fine, N.R. (2004) *Dialysis Treatment Book,* Gunes Medical Bookstores, Ankara, pp 35-50.
- Ro, Y. J., Ha, H. C. & Kim, C. G. (2007). The effects of aromatherapy on pruritus in patients undergoing hemodialysis. *Dermatol Nurs 14: 231-234*
- Ro, Y. J., Ha, H. C., Kim, C. G. Yeom, H. A. (2002) The Effects Of Aromatherapy On Pruritus In Patients Under Going Hemodialysis. *Dermatol Nurs 4: 231-256.*
- Sever, M. S. (1997) *Treatment Options for End Stage Renal Failure.* Turkish Kidney Foundation Publications, İstanbul, pp: 5-7.
- Shahgloian, N., Dehghan, M., Mortazavi, M. Gholami F, Valiani M. (2010) Effect of aromatherapy on pruritus relief in hemodialysis patient. *IJNMR 15: 240-244.*

- Tracy, M. F.& Lindquist, R. (2003) Nursing's role in complementary and alternative therapy use in critical care. *Crit Care Nurs Clin North Am* 15: 289-294
- Tsay SL. (2004) Acupressure and fatigue in patients with end-stage renal disease- a randomized controlled trial. *International Journal of Nursing Studies* 41: 99-106
- Williams, A.G., Crane, P. B. & Kring, D. (2007) Fatigue in African American women on hemodialysis. *Nephrology Nursing Journal* 34: 610-618.
- Yalcin, A. U. Akpolat, T.(2000) Chronic renal failure. *Nephrology, Ankara*, pp 272-290.
- Yurtsever, S. Beduk T. (2003) Evaluation of fatigue on hemodialysis patients. *Journal of Research in Nursing* 5: 3-12.