Preventive Care in Nursing and Midwifery Journal
2016 –2017; 6(4): 24-31

The effect of Therapeutic Touch on Physiological Variables of Mechanically Ventilated Patients in Intensive Care Units

Zaeimi M[1], Ramezani-Badr F[2*], Bahrami M[3]

[*1]MSc. Dept. of Critical Care Nursing, School of Nursing and Midwifery, Zanjan University of Medical Sciences, Zanjan, Iran
[2]PhD. Dept. of Nursing, Assistant Professor, School of Nursing and Midwifery, Zanjan University of Medical Sciences, Zanjan, Iran
[3]PhD, Dept. of traditional medicine, Assistant Professor, Zanjan University of Medical Sciences, Zanjan, Iran

Corresponding Author: Dept. of Nursing, Assistant Professor, School of Nursing and Midwifery, Zanjan University of Medical Sciences, Zanjan, Iran

Email: Ramezani.badr@gmail.com

Received: 20 Feb 2016 **Accepted**: 5 Sep 2016

Abstract

Background: Underlying diseases and aggressive procedures, such as different types of surgery and care, for patients with critical conditions in intensive care units (ICU) may be associated with physiological disorders.
Objectives: This study intended to determine the effect of therapeutic touch on physiological variables of patients undergoing mechanical ventilation in ICU.
Methods: This randomized clinical trial with a control group was conducted on 60 mechanically ventilated patients hospitalized in internal and adult intensive care units of educational hospitals of Zanjan University of Medical Sciences from 22 November 2014 to 22 June 2015. Patients were randomly divided into the intervention and placebo groups. Therapeutic touch was administered in four sessions. Physiological variables, such as Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP), Mean Arterial Pressure (MAP), and Heart Rate (HR) were recorded in both groups before and after each therapeutic touch session. Data was analyzed using SPSS 21.
***Results*:** The results from comparison of physiological variables in the intervention group before each session showed a significant reduction only in heart rate ($p<0.001$). Moreover, results from comparison of physiological variables in the intervention group after therapeutic sessions showed significant differences in SBP ($p=0.025$), MBP ($p=0.033$), and HR ($p=0.002$).
Conclusion: It seems that therapeutic touch can result in a greater stability of some physiological variables of mechanically ventilated patients, if it is administered frequently for long term.

Key words: Therapeutic touch, Physiological variables, Mechanically ventilated patients, ICU

Introduction

Several patients are hospitalized in ICUs every year. There happen two million traffic and non-traffic accidents in Iran, out of which 20-30 percent are in need of ICU hospitalization [1]. Due to the involvement of vital organs, these patients may need aggressive and non-aggressive monitoring in terms of medical and nursing care as well as stability of physiological and psychological signs [2]. According to a report by the American Society of Critical Care Medicine, more than 5.7 million individuals are admitted yearly to intensive care units, out of which 20-30 percent are in need of mechanical ventilation [3,4].

Mechanical ventilation, as a widely used therapeutic device for correcting respiratory failures [5,6], is associated with such

complications as fear, inability to speak, increased work of breathing, barotrauma, and decreased cardiac output [7,8]. To achieve physiological stability in ICU patients, medicinal [9] and non-medicinal methods such as yoga, music therapy, therapeutic touch (TT), hypnotism, relaxation, massage therapy, and acupuncture are used [5, 10].

Therapeutic touch is among the most common types of complementary therapies. It is originated from eastern culture. Therapeutic touch was first introduced to nursing in 1970 by Krieger, a professor at New York University School of Nursing [11-13]. It is based on Roger's theory, which looks at human as unitary fields of energy that are in an interaction with their environment [14]. Nursing measures are essential when the balance between human energy fields and environment energy is disrupted. In this model, energy imbalance is sensed by therapist's touch [10,15]. In therapeutic touch, as a focusing technique, therapists are aware of energy in their hands and use them to restore balance and harmony in energy flow. The therapists feel the energy field as a sense of softness or mild fluctuations; whereas, it is felt as pressure, heat, cold, and tingling sensations in case of illness. As a result, the therapists try to re-pattern and restore harmony to the patient's entire energy system [13]. First, the therapists enter the state of centering to fully concentrate on healing the client. Then they move their hands 5-10 cm above the clients' body to create energy balance and harmony through a bio field interaction between themselves and the clients [16]. Benefit of this technique has been proved in healing burn wound, controlling chronic pains, tension headaches, cesarean section pain, and arthritis pain, and reducing anxiety [17].

Zolfaghari et al. (2004) showed that therapeutic touch decreased systolic and diastolic blood pressure (SBP&DBP), heart rate (HR), and respiratory rate (RR) in patients with cardiovascular diseases [10]. According to Zare et al. (2007), despite the effectiveness of therapeutic touch in improving HR and RR, it had no effect on SBP, DBP, and body temperature of patients with cardiovascular diseases [17]. Post-White et al. (2003) reported that therapeutic touch decreased RR, HR, SBP, and DBP in cancer patients undergoing chemotherapy [18]. Olson et al. (2003) also reported the effectiveness of therapeutic touch in physiological symptoms of cancer patients through decreasing SBP and HR in the first day, and reducing DBP in the fourth day [19]. Despite some differences and contradictions in results of some similar studies, it seems that therapeutic touch can affect physiological stability of patients. The majority of reviewed studies on therapeutic touch have been conducted on conscious patients; whereas, there are scant studies on the effect of therapeutic touch on unconscious patients. Since therapeutic touch is a non-aggressive method which does not need any specific equipment and is applicable to all ages and that there is insufficient evidence about its effectiveness in physiological stability of mechanically ventilated patients, this study was conducted to investigate the effect of this technique on such patients.

Methods

This single-blind randomized trial, was registered in Iranian Registry of Clinical Trials and approved by the Ethical Committee. In this study, the person responsible for recording physiological variables, as well as the person responsible for performing analyses did not know about the research groups. Subjects were selected using convenience sampling technique, and the sample size was estimated 25 subjects for each group. In order to use parametric tests and consider probable sample loss, the number of subjects in each group was considered 30. In this study, 60 eligible patients undergoing mechanical ventilation in ICUs of two educational hospitals (Ayatollah Mousavi and Valiasr) in Zanjan-Iran were randomly divided into the intervention and placebo groups using the block design method. The study was conducted from 22 November 2014 to 22 June 2015.

Inclusion criteria were patients hospitalized in ICU, undergoing mechanical ventilation (GCS≥8), aged 15-60 years old, and without acute neurological problem, head trauma, and history of mental illness. Patients should also attend at least four therapeutic touch sessions in four consecutive days in the unit. In addition, required

consent was obtained from the first-degree relatives or legal guardians of the patients. Exclusion criteria were patients transferred to other units, passed away, whose blood pressure and heart rate were higher or lower than 20% of the baseline, and lack of coordination with ventilator. After attending the research site, explaining the research project to legal guardians of the subjects, and obtaining their written informed consent, the subjects were randomly and equally divided into the intervention and placebo groups. First, a questionnaire was used to collect demographic and disease-related data of the patients. The content validity of the underlying data inventory was approved by six faculty members of Zanjan University of Medical Sciences. Before the initiation of the study, physiological variables of the samples, such as HR, SBP, and DBP, were measured for validity and reliability assessment, using a calibrated monitoring device (Sa'adat Company). The obtained data was then recorded by a nursing colleague, who did not know about the research groups. In addition, the following formula was used to calculate MAP [20].

$$MAP=2/3\ DBP+1/3\ SBP$$

In the intervention group, the therapeutic touch sessions, each lasting for 15-20 minutes, were held once per day for four consecutive days on the evening and night shifts at the bedside of dressed patients in the supine position. To help the patient, the therapist concentrated on therapist treatment by placing her hands 5-20 cm away from the patient's body to assess the client's chakras from the head to the sole. In the next stage, the therapist tried to create balance through the client's body. This was done by sweeping the hands over where energy accumulation was sensed to clear these regions and moderate the excess energy. In the next stage, the therapist used her hands to balance energy flow by distributing the excess energy to areas of low energy. After restoring the energy fields through the client's body, these fields were re-assessed to ensure uniformity and symmetry of them. The therapist was a registered nurse certified from world Pranic Healing Foundation Insitute Immediately after each intervention; the aforementioned physiological items were investigated and recorded by a colleague nurse, who did not know about the research groups. In the placebo group, the therapist only mimicked therapeutic touch without any therapeutic intention or applying therapeutic touch principles. Data was analyzed using SPSS-21. The chi-square test and independent *t*-test were used to compare demographic and underlying variables between the two groups. In addition, mixed design repeated measures were used to compare dependent variables during four sessions in each group and between the two groups. Moreover, the least significant difference (LSD) was used to perform paired comparison analysis on dependent variables in four periods before and after therapeutic touch sessions. To determine within-group effects, the compound symmetry was first investigated, using the Mauchly's Sphericity test. Moreover, the results of the homogeneity of variance test were first investigated to determine the between-groups effects.

Results

According to the results, 36.7% and 63.3% of all subjects were female and male, respectively. The mean age of patients was 44.8±13.9 years. Trauma, internal diseases, and surgery accounted for 36.7%, 33.3%, and 30% of hospitalization, respectively. The mean hospital stay was 8.87±6.36 days. According to data, 26.7% and 73.3% of patients were with and without history of hospitalization. None of the patients used muscle relaxants and supplements. In addition, 30% and 70% of patients were with and without ulcers (bedsore, phlebitis, scratches), respectively. All patients were ventilated with SIMV device. Data analysis (Table 1) showed that both groups were homogeneous in terms of demographic and some underlying variables, and they were not significantly different ($p>0.05$).

Table 1: Comparison of some demographic and underlying variables between the intervention and placebo groups

Demographic variables		Intervention (n=30)	Placebo (n=30)	P value
Sex n(%)	Male	9(30)	13(43.3)	0.284*
	Female	21(70)	17(56.7)	
Admission indication n(%)	Trauma	12(40)	10(33.33)	0.817*
	Internal diseases	10(33.33)	10(33.33)	
	Surgery	8(26.67)	10(33.33)	
Past medical history n(%)	Yes	7(23.33)	9(30)	0.559*
	No	23(76.66)	21(70)	
Past background disease n(%)	Yes	9(30)	13(43.33)	0.284*
	No	21(70)	17(56.67)	
Age (Mean±SD)		44.8±14.3	45±13.8	0.96**
GCS (Mean±SD)		9.03±0.9	9.13±1.1	0.087**

***Chi-square test**
****Independent T Test**

There was no significant differences between intervention and placebo groups in terms of physiological variables before therapeutic touch sessions (p>0.05). The Repeated Measurement test results for comparison physiological variables before therapeutic sessions in four periods showed that only HR in the intervention group was significant (p<0.001). The results from between-groups analysis showed that none of the research variables (SBP, DBP, MAP, and HR) was significant in different periods before the sessions. Moreover, there was no significant interaction between the investigated groups and measurement times before the intervention in four sessions (Table 2).

Table 2: Comparison of changes in physiological variables in four periods before therapeutic sessions in the intervention and placebo groups

Physiological variables		1st session	2nd session	3rd session	4th session	P value
		Mean±SD	Mean±SD	Mean±SD	Mean±SD	
SBP mm/Hg	**Intervention**	127±15.86	124.2±12.3	126.1±12.4	126.3±13.2	0.203*
	Placebo	124±20.86	125.4±16.8	124.6±16.6	124.9±17.4	0.869*
						0.741**
DBP mm/Hg	**Intervention**	76.2±17.52	76.26±9.25	79.96±8.5	79.96±8.9	0.197*
	Placebo	76.4±15.35	76.03±13.5	77±13.79	75.8±13.35	0.631*
						0.393**
MAP mm/Hg	**Intervention**	94.8±12.93	92.45±9.24	95.16±9.35	95.4±2.92	0.169*
	Placebo	90.6±17.3	92.5±14.13	92.7±14.2	92.1±13.8	0.711*
						0.4**
HR p/min	**Intervention**	89.3±13.99	88.3±13.39	83.4±13.25	83.6±12.4	<0.001*
	Placebo	91.1±19.68	88.03±18.09	75.8±17.95	85.56±16.6	0.086*
						0.697**

***Tests of Within-Subjects Effects**
****Tests of Between-Subjects Effects**

Results of Repeated Measure test in four periods after therapeutic sessions showed a significant difference in the intervention group in MAP (p=0.043), SBP (p=0.047), and HR (p=0.002). Results from between-groups analysis after TT sessions were not significant in none of these periods (Table 3).

Table 3: Comparison of changes in physiological variables in four periods after therapeutic sessions in the intervention and placebo groups

Physiological variables		1st session	2nd session	3rd session	4th session	P value
		Mean±SD	Mean±SD	Mean±SD	Mean±SD	
SBP mm/Hg	Intervention	127.3±14.9	123±12.6	125.3±12	122.93±14	0.047*
	Placebo	126±20.21	126.6±17.07	126.6±17.4	125.8±17.1	0.956*
						0.857**
DBP mm/Hg	Intervention	78.4±12.38	76.56±2.92	80.03±9.84	79.26±8.61	0.084*
	Placebo	76.4±15.35	78.36±13.2	79.03±12.3	77.9±13.39	0.634*
						0.884**
MAP mm/Hg	Intervention	94.6±12.46	90.96±9.57	92.9±10.24	92.86±9.9	0.043*
	Placebo	89.7±21.1	94.6±14.16	92.1±20.93	94.53±14.7	0.361*
						0.722**
HR p/min	Intervention	88.8±13.2	86.8±13.71	84.33±12.78	82.4±12.84	0.002*
	Placebo	90.03±19.54	88.9±18.01	87.3±17.19	86.5±15.5	0.165*
						0.44**

*Tests of Within-Subjects Effects
**Tests of Between -Subjects Effects

Results from paired comparison of significant variables are presented in Table 4. According to the results in this Table, TT mostly leads to significant changes in MAP, SBP, and HR after three to four sessions.

Table 4: Paired comparison of physiologic variables between four therapeutic sessions in the intervention group based on LSD

Physiologic variables	Sessions	P value
SBP mm/Hg	1&2	0.006*
	1&3	0.375
	1&4	0.005*
	2&3	0.398
	2&4	0.812
	3&4	0.771
MAP mm/Hg	1&2	0.021*
	1&3	0.557
	1&4	0.535
	2&3	0.497
	2&4	0.524
	3&4	0.994
HR p/min	1&2	0.146
	1&3	0.073
	1&4	0.042*
	2&3	0.377
	2&4	0.301
	3&4	0.886

*P value<0.05

Discussion

Findings of the present study showed that therapeutic touch (TT) is effective in improving some physiological variables of mechanically ventilated patients. Investigations into physiological variables before the initiation of sessions in the intervention group showed an insignificant SBP reduction; whereas, a significant reduction was observed in HR ($p<0.001$). According to the results, a difference

was observed in HR between the first session and the third/fourth sessions, and between the second session and the third/fourth sessions. In addition, holding frequent TT sessions could have a greater effect on this variable. No significant difference was observed in physiological variables in the placebo group before the sessions. Zare et al. (2007) conducted a study entitled "Effect of Therapeutic Touch on Vital Signs of Patients before Coronary Bypass Surgery" and found out that HR and RR were significantly different before and after the intervention [17]. According to the results of comparison of physiological variables after TT sessions during four sessions, there was a statistically significant reduction in SBP, MAP, and HR variables in the intervention group. According to the results, SBP difference between the first and second sessions, and between the first and fourth sessions was significant (with average reduction of 4 mmHg). Moreover, holding frequent TT sessions resulted in greater SBP reduction. Regarding the complex and acute conditions of hospitalization in ICU, this amount of reduction can have clinical value. In other words, TT as a safe complementary care can complement therapeutic results of aggressive care and treatments. Rahmani et al. (2001) investigated the effect of back massage on some physiological indices of patients in ICU and reported a significant MAP reduction (3 mmHg) [21]. They observed a significant difference between the first and second sessions in terms of MAP. Similar to the present study, this research was done on patients in ICU and reported the clinical value of MAP reduction, indicating its effectiveness in the treatment of patients. In both studies, complementary methods, usually used along with conventional treatments were employed as the intervention. Results from comparison of HR between four sessions after the intervention showed a significant difference between the first and fourth sessions. With respect to these variables, significant effects of holding frequent sessions on HR reduction were observed. According to the results, TT was effective and ineffective in the intervention and control groups, respectively. Zare et al. reported that TT had no significant effect on SBP, DBP, and body temperature of patients before and after the intervention [17]; however, insignificant reduction of SBP was not consistent with the finding of the present study. Zare et al. held only one TT session, which revealed the effectiveness of holding frequent TT sessions in significant reduction of these variables. Zolfaghari et al. (2004) compared the effects of progressive muscle relaxation and TT on anxiety, vital signs, and cardiac dysrhythmia in Iranian female samples, undergoing cardiac catheterization. They found that TT reduced SBP, HR, and RR [10]. In both studies, four TT sessions were held, which may be the reason for similarity of the results. On the other hand, Cox et al. (1999) conducted a study entitled "Effect of Therapeutic Touch on Physiological and Psychological Responses of Patients in ICU" [22] and reported no significant decrease and/or increase in physiological variables before, during, and after TT intervention. Results of this study were inconsistent with ours. Several factors, including lower number of TT sessions in Cox et al.'s study (two sessions for each patient, on average), resulted in this inconsistency. This is because holding more sessions could bring about some effects on these variables in the long term. On the other hand, similarity of research environment, i.e. ICUs, was an important point of these studies. This is because the effect of TT on patients in ICUs has been less addressed. Since such patients have complex medical and care conditions, restoring harmony to their energy field, and subsequently the effect of TT on their conditions may last longer than conscious patients with better health conditions.

Post-White et al. (2003) reported that TT reduced RR, HR, SBP, and DBP in cancer patients under chemotherapy. In their study, TT sessions were held once per week for four consecutive weeks [18]. Olson et al. (2003) also reported the effectiveness of TT in physiological symptoms of cancer patients through decreasing SBP and HR in the first day and reducing DBP in the fourth day [19]. The difference in the effectiveness of TT in SBP in the first day in the Olson's study and the effectiveness of TT in SBP in the second and fourth days in our study may be attributed to the type of patients in these two studies. According to the aforementioned studies, HR reduction through

TT can be due to the sense of calmness developed in patients.

Moreover, comparison of results between this and other similar studies showed that in addition to TT technique, the number of TT sessions should be taken into account. Therefore, future studies can be conducted with different number of sessions and on patients in other units.

Researchers believe that due to critical conditions of patients and their need for receiving aggressive interventions, they can benefit from TT, as a safe cost-effective complementary method, along with conventional treatments. Regarding the lack of significant difference between the two groups in four TT sessions and some limitations, such as small sample size, and the lack of separate place for holding the sessions, further studies are required to determine the effectiveness of this complementary method and to design a comprehensive protocol for it.

Acknowledgments

This article is part of a Master's thesis approved under the code ZUMS.REC.154/1393 by the Ethical Committee in 18 November 2014. It was registered in the Clinical Trial Registration Center of Iran under the code IRCT2015061112257N3. This research was fully financed by Zanjan University of Medical sciences. Hereby, we thank the Research Department of Zanjan University of Medical Sciences, as well as reverend professors and all colleagues and personnel of Valiasr and Ayatolllah Mousavi in Zanjan for their full cooperation in conducting this study.

Conflicts of interest: None declared

Funding:

Zanjan University of Medical Sciences and Health Services financially supported this study.

References

1. Geyamat M. Crisis of intensive care unit in Iran [cited 2011]. Available at:http://www.tabnak.ir/fa/news. [In Persian]

2. Bradt J, Dileo C, Grocke D. Music interventions for mechanically ventilated patients. Cochrane Database Syst Rev. 2010; 12:1-46.

3. Medicine SOCC. Critical Care Statistics. [cited 2015]. Available at: http://www.sccm.org/Communications/Pages/CriticalCareStats.aspx.

4. Chlan l, Savik k. Patterns of Anxiety in Critically III Patients Receiving Mechanical Ventilatory Support. Nurs Res. 2011; 60(3): S50-S7.

5. Tracy MF, Chlan L. Nonpharmalogical interventions to manage common symptoms In patients receiving mechanical ventilation. Crit Care Nurse. 2011; 31(3): 19-28.

6. Airosa F, Falkenberg T, Ohlen G, Arman M. Tactile massage or healing touch: Caring touch for patients in emergencycare–A qualitative study. Eur J Integr Med. 2013; 5(4): 374-81.

7. Souri Lakie A, Bolhasani M, Nobahar M, Fakhr Movahedi A, Mahmoudi H. The effect on touch on the atrial blood oxygen saturation in agitated patients undergoing mechanical ventilation. Iran J Crit Care Nurse. 2012; 5(3): 125-32. [In Persian]

8. Vasques C, Santos D, Cervalho E. Trends in research involving the use of therapeutic touch as a nursing strategy. Acta Paul Enferm. 2011; 24(5): 712-40.

9. Aghebati N, Mohammadi E, Pooresmaeil Z. The effect of therapeutic touch on pain in women with cancer in the hospitaL. J Gorgan uni Medi Sci. 2007; 9(1): 36-42. [In Persian]

10. Zolfaghari M, Ahmadi F. The effect of progressive muscle relaxation and therapeutic touch on anxiety and vital sign and cardiac rhythm disorders. Daneshvar Med. 2005; 11(51): 33-40. [In Persian]

11. Ravanipour M. The effect of therapeutic touch on pain after cesarean section. Iran South Med J. 2004; 7(1): 34-39. [In Persian]

12. Taheri M, Yaryari F, Molavi M. The effect of therapeutic touch on anxiety in patients with irritable bowel syndrome. J Complementary Medi. 2013; 3(1): 406-17. [In Persian]

13. Tomey A, Alligood M. Nursing theorist and their work. 6th ed. Philadelphia: Mosby; 2006.

14. Moafaghi Z. Therapeutic Touch and its position in Nursing. J nursing and midwifery Mashhad uni. 2003; 18(17): 66-69. [In Persian]

15. Zafarnia N, Kohan S, Abbaszadeh A, Nakhaei G, Miri S, Soleymani L. The effect of therapeutic touch on anxiety in female patientsa waiting

surgery. Qual Res Health Sci. 2010; 10(1): 42-51. [In Persian]
16. Lin Y, Taylor A. Effect of therapeutic touch reduction pain and anxiety in an elderly population. Integr Med Int. 1998; 1(4):155-62.
17. Zare Z, Shahsavari H, Moeini M. Effects of therapeutic touch on the vital signs of patients before coronary artery bypass graft surgery. Iran J Nurs Midwifery Res. 2010; 15(1): 37-42.
18. Post-White J, Kinney ME, Savik K, Gau JB, Wilcox C, Lerner I. Therapeutic massage and healing touch improve symptoms in cancer. Integr Cancer Ther. 2003; 2(4): 332-44.
19. Olson K, Hanson J, Michaud M. Aphase II trial of Reiki for the management of pain in advanced cancer patients. J Pain Symptom Manage. 2003; 26(5): 990-97.
20. Monahan F, Sands J, Neighbors M, Marek J, Green C. Phipps Medical surgical nursing: Health and illness perspectives. 8th ed. Kidlington: Elsevier Science Health Science; 2006.
21. Rahmani H, Abdollahi A, Nasiri H, Vakili M. Effect on back massage on physiological variabels on patients in intensive care unit. J Gorgan uni Medi Sci. 2001; 3(2): 53-58. [In Persian]
22. Cox C, Hayes J. Physilogic and Psychodynamic responses to the adminsteration of therapeutic touch in critical care. Complement Ther Nurs Midwifery. 1999; 5(3): 87-92.