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RESEARCH ARTICLE

THE EFFECT OF SENSORY STIMULATION PROVIDED BY FAMILY ON SYSTOLIC AND DIASTOLIC BLOOD PRESSURE AND HEART RATE IN CRITICAL CARE PATIENTS

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ABSTRACT

Background: Stressors in the intensive care unit (ICU) impair patients' comfort, excite the stress response, and change their vital signs. Non-medical interventions are recommended by several studies as a treatment to improve comfort in the ICU patients. Sensory stimulation is one of the most important interventions. Since vital signs is an important index of patients' clinical condition, this study aimed to investigate the effect of sensory stimulation provided by family on systolic and diastolic blood pressure and heart rate in critical care patients.

Materials and Methods: This study is a clinical trial conducted on 64 patients hospitalized in the ICU wards of Al-Zahra and Kashani hospitals in Isfahan, Iran in 2012 and 2013. The patients were selected by simple sampling method and were randomly assigned to two groups (study and control). Patients' systolic and diastolic blood pressure and heart rate were measured 10 min before, immediately after, 10 min and 30 min after sensory stimulation in the study group, and simultaneously in the control group without any intervention.

Results: Repeated measures analysis of variance (ANOVA) showed a significant difference in the mean of systolic and diastolic blood pressure and heart rate 10 min before, immediately after, 10 min and 30 min after sensory stimulation in the study group ($P < 0.001$), but in the control group, the difference was not significant ($P = 0.33$, $P = 0.77$, and $P = 0.37$ respectively).

Conclusion: Application of sensory stimulations as a nursing and non-medical intervention by the family members improves comfort and decreases the mean of systolic and diastolic blood pressure and heart rate in critical care patients.

INTRODUCTION

Intensive Care Unit (ICU) is a ward that caters to patients with acute and life-threatening diseases (Mottahedian Tabrizi *et al*., 2010). The patients hospitalized in this ward experience numerous stressors due to environmental factors and specific treatment conditions or surgery. Physiological reactions excite the stress response and lead to an increase in BP, pulse, and respiratory rate (Besel, 2006; Khost *et al*., 2006). One of the most important stressors is sensory deficit, which is caused by either deprivation or overload of sensory stimulation (Im and Kim, 2009; Daniel *et al*., 2010). Apart from the irregular responses that the disease causes in a patient's body, with ICU being an unfamiliar place concerning appearance, noise, and smells, the patient's sensory stimulations have no specific meaning and content and their normal patterns are deleted. Sensory deficit acts as major stressor and influences the physiological balance of the body (Edwards and Sabato, 2009; Potter and Perry, 2009). Research showed an increased level of stress in 85% of patients hospitalized in the ICU (Dijkstra *et al*., 2009). For most of the patients in this ward, medical interventions are usually used to relieve patients' anxiety and provide them with comfort (Rowe and Fletcher, 2008). These interventions have numerous complications of which the most important are a reduction in consciousness and a defect in patients' cognitive function. Non-medical interventions are suggested as the patients' conscious status and their active participation in care are very important in the ICU. These interventions not only bring about a feeling of comfort and never decrease patients' consciousness, but also lead to their active participation in care (Henricson, 2008). One of the most important interventions is sensory stimulation. Due to this, the patients' stimulations are organized and the patients are provided with meaningful and clear contents concerning the severity, time, and frequency (Ismail, 2010).

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Sensory stimulations can be applied to all five senses, but those of tactile and olfactory senses are more convenient, functional, and applicable (Abbasi *et al*., 2009; Bassampoor *et al*., 2007). Most of the studies have reported being in an unfamiliar environment and being far away from the family members as the most important causes for patients' anxiety (Abbasi *et al*., 2009; Oh and Seo, 2003; Kamrani *et al*., 2010; Wenham and Pittard, 2009; Ramont *et al*., 2010 and Coyer *et al*., 2007). Happ *et al.* stated that the patients discharged from ICU claimed that presence of their family members beside them made them stress free in the ICU (Happ *et al*., 2007). Eriksson and Bergbom stated that presence of a beloved person means a real touch for the patients and gives them the power and hope to face a serious disease (Eriksson and Bergbom, 2007). Therefore, it can be concluded that presence of family members, in addition to helping the family, copes with the crisis by changing the patients' sensory stimulations to a meaningful content and promoting patients' peace and comfort through making a supporting and familiar environment (Ramont *et al*., 2010; Coyer *et al*., 2007). Unfortunately, 44% of ICU wards prohibit the entry and presence of patients' families and argue that by this, patients' physiological stress is increased (Hajihosseini *et al*., 2006).

Those ICU wards in which the family members are permitted to enter have no specific program to apply sensory stimulations. So, the family members enter the ward with no special training and they are often worried as to how to provide their patients with peace and comfort (Sole *et al*., 2009; Olsen *et al*., 2009). As the care of all patients is to be administered by nurses, they are responsible for applying sensory stimulations and can involve family members in helping their patients. They should detect appropriate sensory stimulations with the help of the family members and provide the patients with an environment rich in meaningful stimulations (Bassampoor *et al*., 2007; Hajihosseini *et al*., 2006 and Kavousipour *et al*., 2007). As nurses are accountable for what they do, they have the right to know the effects of nursing interventions on the patients. Control of hemodynamic status is a routine and vital function in the intensive care unit and helps us to monitor the general health of patients and to identify responses to physical and psychological stress, and medical and nursing interventions. In fact, temperature, pulse and blood pressure are the most common indicators measured by health care workers and they show the normal functioning of the circulatory, respiratory, nervous system (Rivera-Fernandez *et al*., 2007; Imani *et al*., 2009).

Abbasi *et al*. (2009), studied the effects of touch and talk by family members on patient's level of consciousness in intensive care units and announced that this intervention improve the level of consciousness of the patients (Abbasi *et al*., 2009). Henrykson *et al*. in 2008 investigated impact touch on patients' vital signs and showed that touches has no effect on systolic pressure and heart rate (Henricson *et al* ., 2008). Haj Hussein *et al.* study on the effect of twenty minutes of sensory stimulation with massage on vital signs of comatose patients' in intensive care for three days showed a significant decreases on patients' pulse, blood pressure and breathing (Hajihosseini *et al*., 2006). Cambron, Dexheimer and Coe (2006) study on effect of sensory stimulation on blood pressure and suggest that painful sensory stimulation such as painful massage significant increase in blood pressure and non-painful massage decrease blood pressure, but there is no significant between two groups (Cambron and Dexheimer 2006). In auditory stimulations, most of investigations study the impact of music on patients' vital signs, but they used sound of family members in a few studies. Dijkstra *et al.* (2009) assessed the effect of music on vital signs of hospitalized patients in critical care unit, and had no significant difference on physiological parameters (Dijkstra *et al*., 2009). Thomas and *et al* (2010) used music in their study on cycle cell anemia patients in control group and music with touch in study group, but they did not found significant difference on patients' vital signs (Thomas, 2012). Puggina, Silva and Santos (2011) compare a familiar music and a recorded voice of family members for changing in vital sign, and reported that voice of family members is a more powerful stimulator than familiar music (Puggina and Silva, 2012). Based on all the above-mentioned issues, and challenges that still 44% of the personnel of special wards is prevented from entering the family members (Sole and Klein, 2009), and there is no special program for sensory stimulation or visiting of patients in these wards, we conducted the present study to investigate the effect of sensory stimulation provided by family on arterial blood pressure and heart rate in critical care patients.

MATERIALS AND METHODS

This is a two-group clinical trial (IRCT2013110215241N1). The subjects comprised 64 patients hospitalized in the ICUs of Al-Zahra and Kashani hospitals affiliated to Isfahan University of Medical Sciences from December 2012 to June 2013. They satisfied the inclusion criteria and were selected through convenient sampling. The inclusion criteria were age 18–60 years; admission in the ICU ward for >24 h; 9 ≤ Glasgow Coma Scale (GCS) ≤ 12; having taken tranquilizers and narcotics (if needed) at least 6 h prior to the time of sampling; no addiction to smoking, alcohol, or drugs; no mental, hearing, or dermatological problems; availability of the patient's beloved person; no intake of medications like nitroglycerin, dopamine, or dobutamine at the time of the sampling; and hemodynamic stability on the day of research (pulse 60–100/min, mean BP >65 mmHg, and O_2 saturation>90%). To conduct sampling, after obtaining approval from the Isfahan University ethics committee and a written permission from the university hospitals' authorities, the researcher referred to the research environment daily and selected the patients meeting the inclusion criteria. Then an informed written consent was obtained from the legal guardian of the patient if he/she was interested in participating in the study, and the subject was assigned to study or control group through random allocation. Sampling continued simultaneously until 32 subjects were assigned to the study and control groups.

Data were collected in a two-section questionnaire by questioning the patient's accompanying person, referring to the patient's file and the measurements of the physiological values. The first section was on subjects' demographic information and the second section contained an systolic and diastolic blood pressure and heart rate record form. This questionnaire was designed by the researcher based on a review of text books and similar articles and its content validity was established.

Reliability of the systolic and diastolic blood pressure and heart rate record form was confirmed by $r = 0.93$. To measure the systolic and diastolic blood pressure and heart rate, a monitoring device (Pooyandegan Rah Saadat Co., Ltd, Tehran, Iran) with a standard cuff was connected to the patient. Its validity was confirmed by its popular brand name and calibration at the time of study. After selection of the subjects and obtaining the written informed consents from their legal guardians, the researcher completed the demographic information questionnaire and then educated the patients' beloved person concerning the correct method of intervention (touching and talking to the patient). Next, patient's systolic and diastolic blood pressure and heart rate was checked and recorded as a dependent variable twice a day between 10–12 AM and 3–5 PM, 10 min before intervention.

In the study group, the environment was kept peaceful and quiet for 10 min. Then, after washing and disinfecting the hands by antibacterial gel and wearing a gown and sleepers, a family member sat by the patient, held the patient's hand smoothly, touched and called the patient by his/her name, and greeted and talked to him/her for 5 min about the trend of recovery and the ongoing interventions. After 5 min, there was 1 min of silence and no touch. The related family member again touched the patient's head and face smoothly and oriented him/her to the current time and talked about household events and family members for 5 min. After a minute of silence, finally, the relative held the patient's hands, touched him/her, wished him/her good health, and said good bye in the final 5 min. Except for emergency interventions leading to patient's exclusion from the study, no more extra intervention was conducted for the patients and peace and quietness prevailed around the patient. At the end of intervention, the family member left the ward and patient's systolic and diastolic blood pressure and heart rate was checked on the monitoring device and recorded immediately after, 10 min after, and 30 min after intervention. In the control group, subjects' systolic and diastolic blood pressure and heart rate was checked and recorded by the monitoring device with no intervention, at time points of 0, 27, 37, and 57 min.

The families of control subjects were permitted to meet, touch, and talk to their patients after study. It should be noted that the intervention technique and the time points of systolic and diastolic blood pressure and heart rate measurements were designed and finally modified based on related texts and nurses' experiences in the ICU and after checking with some of the teachers in Nursing and Midwifery School of Isfahan University of Medical Sciences as well as the nurses working in ICU. Data were analyzed by descriptive statistical tests including frequency distribution tables and distribution, mean and SD, and inferential statistical tests such as chi-square, Mann–Whitney, independent *t*-test, repeated measure analysis of variance (ANOVA), and Least Significant Difference (LSD) *post hoc* test through SPSS version 16.

RESULTS

The findings showed no significant difference in demographic variables such as sex, patient's age, family member's age, hospitalization length, GCS, patient's education, family member's education, and patient's hospitalization service in the study and control groups Table 1. Most of the subjects were self-employed in the study and control groups (53.1%). About 50% and 56.2% of the family members were homemakers in the study and control groups, respectively. Family members were the patients' spouses in about 50% in the study group and 53.1% in control group. About 59.4% of subjects in the study group and 65.6% in the control group were connected to ventilator. Chi-square test showed that the study and control groups were absolutely homogenous concerning demographic variables. In the study group, repeated measure ANOVA showed a significant difference in mean systolic and diastolic blood pressure and heart rate at four time points ($P < 0.001$), and mean of systolic and diastolic blood pressure and heart rate decreased, but these mean values showed no significant difference in the control group (P=0.8, P=0.52, and P=0.78 respectively) Table 2.

Table 1. Comparison of demographic variables of control and study groups

Group / Variable		Study	Control	*P*
Sex	Male	71.9%	75%	0.78
	Female	28.1%	25%	
Patients' age	Mean	38.7	41.3	0.46
Family member's age	Mean	41.1	39.5	0.58
Level of consciousness	Mean	10.7	10.6	0.74
Hospitalization length	Days	10.6	9.97	0.8
Admitted in	Internal ward	21.9%	21.9%	1
	General surgery	28.1%	28.1%	
	Neurosurgery ward	50%	50%	
Marital status	Single	28.1%	21.9%	0.58
	Married	68.8%	68.8%	
	Divorced	3.1%	6.2%	
	Widowed	0%	3.1%	
Family member's education	Illiterate	3.1%	3.1%	0.77
	Primary school	40.6%	37.5%	
	High school	34.4	34.4	
	University	21.9%	25%	
Patient's education	Illiterate	3.1%	0%	0.97
	Primary school	37.5%	40.6%	
	High school	34.4%	37.5%	
	University	25%	21.9%	

Table 2. Comparison of mean changes of systolic and diastolic blood pressure and heart rate before, immediately after, 10 and 30 min after intervention in the control and study groups

Group / Intervention time			Study		Control	
			Mean	SD	Mean	SD
Systolic Blood pressure	10 min before		127.03	17.9	127.3	15.1
	Immediately after		124.3	20.8	126.8	15.2
	10 min after		120.7	18.7	127.2	14.6
	30 min after		118.07	18.8	127.5	14.96
Repeated measure ANOVA		*F*	20.3		0.33	
		P	<0.001		0.8	
Diastolic Blood pressure	10 min before		79.95	11.3	80.6	11.5
	Immediately after		78.2	14.03	80.8	10.99
	10 min after		74.9	13.7	80.7	11.6
	30 min after		71.6	12.8	80	12.1
Repeated measure ANOVA		*F*	47.06		0.77	
		P	<0.001		0.52	
Heart rate	10 min before		87.7	12.5	87.1	11.2
	Immediately after		84.6	14.3	87.03	11.6
	10 min after		82.3	14.8	87.2	11.8
	30 min after		79.4	15.7	87.6	12.2
Repeated measure ANOVA		*F*	18.19		0.37	
		P	<0.001		0.78	

Table 3. Comparison of mean changes of systolic and diastolic blood pressure and heart rate before, immediately after, 10 and 30 min after intervention one by one variables in the control and study groups

Group / Time		Study		Control		Independent *t*-test	
		Mean difference	SD	Mean difference	SD	*P*	*T*
systolic blood pressure	Immediately after intervention compared to 10 min before	−2.8	6.4	−0.5	4.8	0.022	2.32
	10 min after intervention compared to 10 min before	−6.4	7.4	−0.09	4.4	<0.001	5.8
	30 min after intervention compared to 10 min before	−8.95	9.4	0.2	5.6	<0.001	6.67
	10 min after intervention compared to immediately after	−3.6	5.6	0.4	5.4	<0.001	4.04
	30 min after intervention compared to immediately after	−6.2	8.6	0.6	5.8	<0.001	5.23
	30 min after intervention compared to 10 min after	−2.6	6.4	0.3	4.6	0.004	2.91
Diastolic blood pressure	Immediately after intervention compared to 10 min before	−1.8	6.4	0.2	5.4	0.06	1.91
	10 min after intervention compared to 10 min before	−5.06	6.5	0.1	5.3	<0.001	1.91
	30 min after intervention compared to 10 min before	−8.3	6.6	−0.6	6.2	<0.001	6.88
	10 min after intervention compared to immediately after	−3.3	3.9	−0.09	3.9	<0.001	4.63
	30 min after intervention compared to immediately after	−6.5	5.2	−0.8	4.9	<0.001	6.43
	30 min after intervention compared to 10 min after	−3.3	3.4	−0.7	3.8	<0.001	4.01
Heart Rate	Immediately after intervention compared to 10 min before	−3.1	5.5	−0.09	2.8	<0.001	3.95
	10 min after intervention compared to 10 min before	−5.06	6.5	0.1	5.3	<0.001	4.92
	30 min after intervention compared to 10 min before	−8.4	9.3	0.5	5.5	<0.001	6.59
	10 min after intervention compared to immediately after	−2.3	5.5	0.2	5.07	<0.001	2.7
	30 min after intervention compared to immediately after	−5.2	7.8	0.6	5.8	<0.001	4.8
	30 min after intervention compared to 10 min after	−2.9	3.6	0.4	2.96	<0.001	2.38

Independent *t*-test showed a significant difference in mean changes of systolic and diastolic blood pressure and heart rate 10 min after intervention compared to 10 min before that ($P < 0.001$, $P < 0.001$, and $P < 0.001$), 30 min after intervention compared to 10 min before that ($P < 0.001$, $P < 0.001$, and $P < 0.001$), 10 min after intervention compared to immediately after that ($P < 0.001$, $P < 0.001$, and $P < 0.001$), 30 min after intervention compared to immediately after that ($P = 0.004$, $P < 0.001$, and $P = 0.004$), and 30 min after intervention compared to 10 min after that ($P = 0.004$, $P < 0.001$, and $P < 0.001$) in the study and control groups respectively Table 3.

DISCUSSION

The results obtained in the study show that presentation of sensory stimulations by family members decreased mean systolic and diastolic blood pressure and heart rate of the patients hospitalized in the ICU, due to which there was a significant difference between these parameters 10 min before intervention and immediately after that, and 10 and 30 min after intervention. As only one sensory stimulation was applied and the family was not involved in the intervention in most of the studies, comparison of the results of the present study with other quantitative studies is difficult. Keshavarz *et al.* reported that Quran voice decrease heart and respiratory rate immediately after intervention compared to 10 min after intervention in premature newborn in the ICU (Keshavars *et al*., 2010). Shirvani *et al.* also reported that Quran voice, as an auditory stimulation, decrease systolic and diastolic blood pressure and heart rate in unconsciousness patients (Shirvani *et al*., 2013). Nilsson (2009) used a unique piece of music for all patients in first day after surgery in critical heart surgery ward, and reported no effect on mean arterial pressure and heart and respiratory rate of patients (Nilsson, 2009).

The results of Nilsson study are not consistent with the present study. The obtained controversial results can be due to differences in the type of the sensory stimulation, methods of applying them, or unfamiliarity of the stimulations for the patients, as well as differences in patients' cultures and tastes. With regard to hearing stimulation on vital sign, Zeydi used the favorite music of patients and reported that except of diastolic blood pressure and heart rate other parameters changed in the patients hospitalized for open heart surgery (Emami Zeydi *et al*., 2011). Puggina, Silva and Santos showed that sounds of family in home are a better stimulator (Puggina *et al*., 2012). The results are consistent with the present study. Mohammadpour *et al.* reported no effect of reflexology massage on the mean arterial pressure, and heart and respiratory rate of patients with stroke at time points of immediately after and 10 and 30 min after massage. The results show that except decrease in heart rate, other parameters had no significant changed (Mohammadpour *et al*., 2013).

It can be concluded that familiar sensory stimulations can decrease systolic and diastolic blood pressure and heart rate in the ICU, and this decreased can be due to meaningfulness of patients' sensory stimulations, and consequently, lowered secretion of stress hormones and increased activity of parasympathetic system. Therefore, it is suggested to give adequate education to the nurses to include sensory stimulation with participation of the families as a major part of nursing care, although in the hospitals, there is no regular visit to the patients due to specific considerations. Comparison of our findings with other studies in which sensory stimulations were not applied with participation of the family members revealed the difference between these two types of stimulations, which can be associated to increased efficacy of familiar stimulations.

Conclusion

Based on our results, it can be concluded that administration of sensory stimulations as a non-medical nursing intervention in the ICU, especially if conducted by the family members under the supervision of nurses, can change the unfamiliar stressful environment of the ward to a familiar convenient place for the patients and decrease their systolic and diastolic blood pressure and heart rate. Participation of family members in the process of patient care, even for those hospitalized in the ICU, is helpful.

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REFERENCES

Abbasi, M., Mohammadi, E. and Sheaykh Rezayi, A. 2009. Effect of a regular family visiting program as an affective, auditory, and tactile stimulation on the consciousness level of comatose patients with a head injury. *Japan Journal of Nursing Science,* 6(1):21-26.

Available at: http://www.kb.psu.ac.th/psukb/bitstream/2010/7097/1/320171.pdf 2013.

Bassampoor, S.H., Zakerimoghadam, F., Faghihzadeh, S. and Goodarzi, F. 2007. Investigation of the effect of organized auditory stimulation on level of consciousness in comatose patients. *Hayat Journal,* 13(4): 15-22. [persian].

Besel, J. M. 2006. The effects of music therapy on comfort in the mechanically ventilated patient in the intensive care unit. A thesis submitted in partial fulfillment of the requirements for the degree of Master of Nursing. Montana state university Available at: http://scholarworks. montana.edu/ xmlui/bitstream/ handle/1/919/BeselJ0506. pdf 2013.

Cambron, J. A., Dexheimer. J. and Coe, P. 2006. Changes in blood pressure after various forms of therapeutic massage: a preliminary study. Journal of Alternative and *Complementary Medicine,* 12(1): 65-70.

Coyer, F. M., Margaret, K. W., Sharon, M. W. and Bronwyn, A. C. 2007. Nursing care of the mechanically ventilated patient: What does the evidence say? Part two. Intensive and critical care nursing, 23: 71-80.

Daniel, R., Grendell, R. and Wilkins, F. R. 2010. Nursing fundamentals: Caring and clinical design making, 2nd ed. Delmar Cengage learning.

Dijkstr,a B. M., Gamel, C., van der Bijl, J. J., Bots, M. L. and Kesecioglu, J. 2009. The effects of music on physiological responses and sedation scores in sedated, mechanically ventilated patients. *Journal of Clinical Nursing*, 19(8-7): 1030–1039.

Dijkstra, B. M., Gamel, C., Bijl, J. J., Bots, M. L. and Kesecioglu, J. 2009. The effects of music on physiological responses and sedation scores in sedated, mechanically ventilated patients. *Journal of clinical nursing,* 19: 1030–1039.

Edwards, S.H, Sabato, M. 2009. A Nurseś survival guide to critical care. Churchill livinstone/Elsevier.

Emami Zeydi, A., Jafari, H., Khani, S., Esmaeili, R. Gholipour Baradari, A. 2011. The Effect of Music on the Vital Signs and SpO2 of Patients after Open Heart Surgery: A Randomized Clinical Trial. *J. Mazand Univ Med. Sci.,* 21(82): 73-82[persian].

Eriksson, T., Bergbom, L. 2007. Visits to intensive care unit patients –frequency, duration and impact on outcome. *British Association of Critical Care Nurses*, 12(1):20-26.

Hajihosseini, F., Avazeh, A., Elahi, N., Shariati, A. and Souri, H. 2006. The effect of massage on comatose patients' vital signs, hospitalized in intensive care units. *Arak University of Medical Sciences Journal,* 9(3):26-35. [persian].

Happ, M. B., Swigart, V. A., Tate, J. A., Arnold, R. A., Sereika, S. M., Leslie, A. and Hoffman, L. A. 2007. Family presence and surveillance during weaning from prolonged mechanical ventilation. Heart lung, 36(1)47–57.

Henricson, M. 2008. Tactile touch in intensive care Nurses' preparation, patients' experiences and the effect on stress parameters. Karlstads University Available at: http://www.diva-portal.org/smash/get/diva2:5595/ FULLTEXT01.pdf 2013.

Henricson, M., Erson, A., Maatta, S., Segesten, K. and Berglund, A. L. 2008. The outcome of tactile touch on stress parameters in intensive care: A randomized controlled trial. Complementary Therapies in Clinical Practice, 14(4): 244–254.

Im, H. and Kim, E. 2009. Effect of Yakson and Gentle Human Touch versus usual care on urine stress hormones and behaviors in preterm infants: A quasi-experimental study. *International Journal of Nursing Studies,* 46:450–458.

Imani, E., Moshtaqeshgh, Z., Ali Hoseini, T., Alavi Majd, H. and AbedSaeidi, J. 2009. The Effect of Foot Massage on Physiological Indicators of Female Patients with CVA Admitted in the ICU. Journal of Shahid Sadoughi University of Medical Sciences And Health Services, 17(2):76-82. [persian].

Ismail, S. 2010.The effects of music on anexiety reduction in patients with ventilator support. master of nursing science thesis (International program), Prince of Songkla University

Kamrani, F., Seyedjavadi, M., Abed Saeedi, Z., Ezati, J., Alavi Majd, H. and Hasanian, E. 2010. Physiologic index of patients before,during and after visiting in coronary care unit in Emam khomaini hospital in Ardebil.J Nurs Midwif ,Shahid Beheshti Univ Med Sci Health Serv, 70 (20):18-22. [persian].

Kavousipour, S., Azimian, M., Mirzaee, H., Karimloo, M. and Sherafat Kazemzadeh, E. 2007. Comparing the Effects of early and late onset sensory stimulation on level of consciousness of the comatose patient. *Journal of Rehabilitation,* 8(4): 21-26. [persian].

Keshavars, M., Eskandari1, N., Jahdi, F., Ashaieri, H., Hoseini, F., Kalani, M. 2010. The effect of holly Quran recitation on physiological responses of premature infant. Koomesh, 11 (3):169-177. [persian].

Khost, N., Moshtagh, Z., Imani, E. and AlaviMajd, H. 2006. Effect of foot massage on physiologic indicators in critically ill patients admitted in the ICU. *Journal of Shahid Sadoughi University of Medical Sciences And Health Services,* 14(3): 69-75. [persian].

Mohammadpour, A., Dehno Alian, A., Mojtabavi, J. 2013. The Effects of Foot Reflexology Massage on Physiological Parameters of Patients with Stroke. Scientific Journal of Hamadan nursing and midwifery faculty 20(3): 50-56. [persian].

Mottahedian Tabrizi, E., Tadrisi, D., Mohammadyari, A., Ebadi, A. and Mirhashemi, S. 2010. Validity and reliability of Ramsy sedation scale in adult patients hospitalized in critical care units. IJCCN 3(1) 15-16. Persian.

Nilsson, U. 2009. The effect of music intervention in stress response to cardiac surgery in a randomized clinical trial. Heart and Lung 38:201–207.

Oh, H. and Seo, W. 2003. Sensory stimulation programme to improve recovery in comatose patients. *Journal of clinical nursing,* 12: 394-404.

Olsen, K. D., Dysvik, E. and Hansen, B.S. 2009. The meaning of family members' presence during intensive care stay: A qualitative study. Intensive and critical care nursing 25: 190-198.

Potter, P. A. and Perry, A. G. 2009. Fundamentals of nursing, 7th ed. Mosby/Elsevier.

Puggina, A. C. G., Silva, M. J. P. and Santos, J. L. F. 2012. Use of music and voice stimulus on patients with disorders of consciousness. Journal of Neuroscience Nursing 2011; 43(1): E8-E16, viewed 28 September. <http://www.google.com/url?sa=tandrct >.

Ramont, R. P., Niedringhaus, D. M. and Towle, M. A. 2010. Comprehensive nursing care, 2nd ed. Pearson.

Rivera-Fernandez, R., Nap, R., Vazquez-Mata, G. and Miranda, D. R. 2007. Analysis of physiologic alterations in intensive care unit patients and their relationship with mortality. *Journal of Critical Care*,. 22(2):120- 128.

Rowe, K. and Fletcher, S. 2008. Sedation in the intensive care unit. Critical Care and Pain, 8 (2): 50-55.

Shirvani, M., Mirzaeian, R. and Ghaderi, A. 2013. The Effect of Holy Quran Sound on Vital Sign and Spo2 in Unconscious Patients Hospitalized in the ICU. 3th Provincial Congress on Quran and Health. [persian].<http://research.skums.ac.ir/dorsapax/userfiles/file/3th-quran-5.pdf>.

Sole, M. A., Klein, D. G. and Moseley, M. J. 2009. Introduction to critical care nursing. Saunders.

Thomas, L. S. 2012. A pilot study: The effect of healing touch on anxiety, stress, pain, pain medication usage, and physiological measures in hospitalized sickle cell disease adults experiencing a vaso-occlusive pain episode', PhD thesis, The faculty of the college of nursing east Carolina university 2010; viewed 10 September. <http:// thescholarship.ecu.edu/.../Thomas_ecu_0600D_1....>.

Wenham, T. and Pittard, A. 2009. Intensive care unit environment. Continuing education in anaesthesia critical care and pain *Journal,* 9: 178-183.

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