

Effect of Family Presence on the Success of Weaning in Intensive Care Units

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Background: Weaning of the patient from mechanical ventilator is one of important stages of treatment in patients undergoing mechanical ventilation. Therefore, this study was done to determine the effect of family presence on weaning success in patients admitted to intensive care units (ICUs).

Materials and Methods: The present interventional quasi-experimental study was performed on 154 patients undergoing mechanical ventilation who were selected through available sampling method and based on inclusion criteria and were randomly divided into intervention and control groups. For the intervention group, the presence of one of the family members was used in process of weaning from the mechanical ventilator. A questionnaire of patients' demographic information, family satisfaction of patients admitted to ICU, and a checklist of recording the patient's vital signs were used to collect the required information.

Results: Based on the results, After the intervention, the patients in the intervention group were in a better condition than the control group in terms of vital signs, time spent for intubation and number of re-intubation, as well as family satisfaction ($P < 0.05$).

Conclusion: The results showed that the presence of family in the process of weaning of patients admitted to the intensive care unit is effective in improving vital signs and physiological indicators and reduces the time spent for intubation and the number of re-intubation in these patients while promoting family satisfaction. Therefore, the use of this method can be used in coordination with members of the treatment team to help patients admitted to the intensive care unit.

Key words: Family; Weaning, Satisfaction; Intensive Care Unit

INTRODUCTION

Mechanical ventilator is one of the most common forms of medical treatment for patients admitted to intensive care unit (ICU) and is an integral part of treatments that most patients need them in critical stages and also those with multiple complications (1). More than 90% of adults in critical situations need mechanical ventilator in ICU (2). The advent of ventilators to support oxygenation and ventilation in patients who are unable to continue normal

breathing for any reason has been able to save lives of many patients from imminent danger (3). The use of mechanical ventilator to treat acute respiratory failure is a life-saving intervention (4). It is estimated that more than one million patients need this device annually, and the estimated cost is about \$ 27 billion a year (5).

Prolonged duration of mechanical ventilation leads to the increase in length of stay of patient in ICUs, which can lead to a shortage of beds in ICUs and the increase in

health care costs (6). On the other hand, timely, rapid, uncomplicated, and successful weaning with shortening of mechanical ventilation period causes reduction of complications of ventilation (the reduced cardiac output and infections caused by artificial ventilation), hyperventilation and hypoventilation, atelectasis, oxygen toxicity, barotrauma, and psychological dependence on ventilation (7). Accordingly, process of weaning of the patient from mechanical ventilator in eligible patients should be started as soon as possible (6). However, early weaning of the patient from the ventilator, if unsuccessful, can lead to re-intubation, which has a prevalence of 4 - 33% potentially causing airway damage, aspiration, and acute lung damage and increasing risk of nosocomial pneumonia by eight times and mortality by twelve times (8). Therefore, weaning of mechanical ventilator should be done with planning of the treatment team and especially with nursing cares (9).

Nurses in ICU are the main providers of life-saving cares and key members in promoting patient-family interaction (10), and are responsible for direct monitoring, evaluation, and delivery of care services (11). These caregivers, as supporter and safety agents, try to provide the necessary conditions for patients' comfort during weaning, so they play a key role in success rate of weaning (12). In this regard, interventions, such as changing patient's condition (13), being comfortable, encouraging to relaxation, controlling environment in terms of temperature, light, sound, and visual images have been performed in order to improve the power needed to deal with weaning (2). According to the previous studies, one of interventions that can be effective and helpful in this field is providing information and cares to family members and in fact, it is a way to benefit from the presence of the family (14). Patients who have survived from life-threatening diseases and have been successfully weaned from mechanical ventilator, have reported the presence of family members in weaning process as important for themselves. Patients have introduced family visits as a stress-free

experience with benefits, such as confidence, comfort, and relaxation (15).

Happ et al., in a study found that the presence of a family member was a contributing factor to some patients during weaning from the ventilator however, in a number of other patients, it was reported as an inhibitory factor and in some cases, and it had no effect on weaning success (15). This was attributed to behavior of the patient's companion, which caused to hinder performance of the treatment staff. Recently, many studies have supported the presence of family with the patient during life-saving measures and have shown that the presence of family has potential benefits for both patient and family, ensuring that things are done properly and based on schedule, providing emotional support, family participation in deciding on life-saving measures, and providing a positive experience for patients, families, and health care workers (10). Findings of the study by Williams et al. showed that the family provides a vital source of emotional support for patients and it makes a valuable contribution to patients' care and recovery in ICU (16).

Family-centered care has been mentioned as one of the main outcomes of nursing in the 21st century and its goal is maintaining integrity of patients' family and providing special and unique care for each patient. In a family-centered education pattern, the active presence of family is essential to assess and identify needs (17). Despite the positive effects of family participation in patients' care, limited research has been done on the relationship between family presence on patients' beds during weaning and its success (15,18,19). Accordingly, in the present study, in addition to emphasizing dimension of family participation in care affairs and implementation of holistic nursing care, the presence of family members was used to touch, stimulate, and visit the patient. Therefore, this study was done to determine the effect of the presence of a family member during weaning on weaning success (duration of weaning, vital signs, and number of re-intubation) and also family satisfaction.

MATERIALS AND METHODS

This research was an interventional semi-experimental study. Statistical population of the study included all patients undergoing mechanical ventilation admitted to ICU of hospitals affiliated to the Ahvaz University of Medical Sciences (Imam Khomeini and Golestan Hospitals) in Ahvaz City (Khuzestan Province, Iran) and their family members, performed in the second half of 2020.

Sample size was determined to be 77 people in each group according to the study by Safaeepour et al. (18) and based on the formula used for specifying sample size ($n = \frac{(z_{1-\frac{\alpha}{2}} + z_{1-\beta})^2 (s_1^2 + s_2^2)}{(\mu_1 - \mu_2)^2}$), the probability of the type I error of 0.05, test power of 90%, and considering attrition probability of 10% in sample size.

Subjects were selected based on inclusion criteria: having 18 - 60 years of age, being intubated and connected to a ventilator, patients resuscitated by cardiopulmonary resuscitation and not connected to a ventilator due to burns, and exclusion criteria were having unstable hemodynamic status and death of the patients. After selecting 154 people, participants were randomly divided into two groups of 77 people namely, intervention and control groups using a table of random numbers. Data collection tools were questionnaire of patients' demographic characteristics, family satisfaction questionnaire of patients admitted to ICUs, and an assessment checklist of vital signs. The first questionnaire was about the demographic characteristics of the units under research including age, gender, level of education, marital status, occupation, and reason of hospitalization, which was completed through an interview with the patients' companion and medical record of the patients.

The family satisfaction in the intensive care unit (FS-ICU-34) instrument was used to assess satisfaction of family members of patients admitted to ICU. Scoring of this instrument is based on standard coding of the Canadian version of FS-ICU-34 instrument developed by Heyland et al., so that, the first and second sub-scales of the 5-point Likert scale are rated as 0-25-50-75-100 or

(excellent, very good, good, average, and poor) for items 1 - 24 and in the third sub-scale, for items of, 25, 29, and 30, answers to the questions are rated on five-choice scale and are descriptive. For item 26, answer to the question is based on a five-choice scale and is descriptive. For item 27, answer to the question is in the form of three-choice scale and is descriptive. For item 28 of the third sub-scale, answer to the question is in the form of three-choice scale and is descriptive. Finally, the highest level of satisfaction is determined with a score of 100, average level of satisfaction with a score of 50, and the lowest level of satisfaction with a score of zero (20).

Translation and validation of this questionnaire have been done by Dolatyare et al., and it has been found that the Persian version of the FS-ICU -34 questionnaire has three dimensions including: satisfaction with the performance of medical staff (12 items), convenience (12 items) and decision making (6 items) with high reliability ($\alpha = 0.95$). Content validity index (CVI) of all the items in the Persian version was obtained by two validity methods of S-CVI / Ave and S-CVI / Universal by 0.97 and 0.86, respectively, indicating good validity of the Persian version of the tool (21). The third instrument was an assessment checklist of vital signs including heart rate, body temperature, aspiration rate, systolic and diastolic blood pressure, and arterial oxygen saturation. Also, duration of weaning and number of the needed re-intubations were included in this checklist.

This study was approved by the Ethics Committee of the Ahvaz Jundishapur University of Medical Sciences with the ethics code of IR.AJUMS.REC.1399.750. First, the researcher introduced himself and the research objectives for participants and reminded them that participation in the study is completely optional and has no effect on their treatment process, and participants' information will remain confidential. In the intervention group and with prior coordination, one of the family members entered the study. Then, they were given two sessions of instruction by two-person discussion between the researcher and the

patients companion in a quiet atmosphere on process of weaning from the ventilator, the patient's vital signs and patient's condition, as well as what they are expected to do for the patient including supportive behaviors like touching (kissing, hugging, and holding hands), performing gentle movements (slow movements of hands, shoulders, head, and face), massage (legs, arms, and shoulders), talking (encouraging the patient to cough, breathe, swallow saliva, recall good memories, expressing words of the treatment staff in their own word for the patient, and asking about the patient's needs and signs), and paying attention to the patient's monitor and connections. After providing the necessary explanations, to ensure proper understanding by the patients companion researcher asked question about the training. The companions who were with the patient were acquainted with environment of the ward and they were instructed to pay attention to request of the doctor and staff, and if they

were asked to stay or leave the ward, then they were not allowed to interfere in performance of the treatment staff and had to stay aside when a critical situation arises for the patient or other patients or leave the ward at the request of staff.

Also, they just paid attention to their patient and participated in this study. The control group received only routine cares. Data analysis was conducted by quantitative data analysis method using SPSS software version 24, descriptive statistics, such as mean and standard deviation and inferential statistics using Chi-Square, Fisher's Exact, and Independent-Samples t-tests at significance level of 0.05.

RESULTS

One-hundred and fifty-four patients participated in this study; all of them completed the survey until the end of the study (Figure 1).

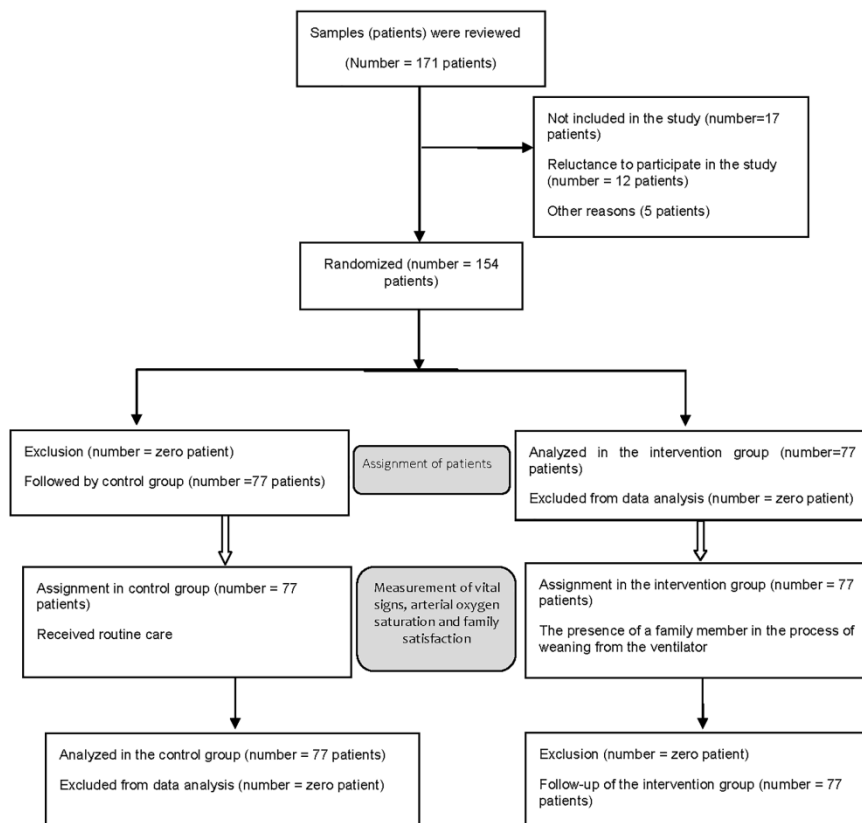


Figure 1. Flowchart of the study design and sampling protocol

Based on the results and comparing the individuals' gender ($p=0.51$) in the two intervention and control groups using Fisher's Exact test, level of education ($p=0.18$), occupation ($p=0.23$), and marital status ($p=0.72$) using Chi-Square test, and patients' age ($p=0.53$) using Independent-Samples t-test, no significant difference was observed between the two groups (Table 1).

Patients' vital signs including temperature, saturation rate, blood pressure, heart rate, and Number of breaths were not significantly different before the intervention between the two groups ($p>0.05$), but there was better situation after the intervention in temperature, heart rate, saturation rate and diastolic blood pressure with ($P<0.001$) and systolic blood pressure and Number of breaths with ($P<0.005$) in the intervention group (Table 2).

The time spent for weaning was equal to 5.00 ± 2.07 and 6.19 ± 2.54 hours in the intervention and control groups, respectively, showing a significant difference between the

two groups using Independent-Samples t-test and the time spent for weaning of patients was significantly less in the intervention group than the control group ($p=0.002$).

The number of patient's re-intubation was equal to 1.50 ± 0.50 and 1.72 ± 0.44 in the intervention and control groups, respectively indicating a significant difference between the two groups using Independent-Samples t-test and the number of patient's re-intubation was significantly less in intervention group than the control group ($p=0.005$). Patients' family satisfaction in the three dimensions including: Satisfaction with performance of medical staff, Convenience assessment, decision making and total satisfaction score demonstrating a significant difference between the two groups using Independent-Samples t-test and family satisfaction of patients was significantly higher in the intervention group than the control group ($p=0.001$) (Table 3).

Table 1. Absolute frequency and relative frequency percentage of demographic variables in two groups

Variables	Intervention group		Control group		Statistical test
	Number	Percentage	Number	Percentage	
Gender	Male	44	57.1	39	P=0.51
	Female	33	42.9	38	
	Single	12	15.6	17	
Marital status	Married	55	71.4	50	P=0.72
	Widow	5	6.5	4	
	Divorced	5	6.5	6	
	Housewife	30	39	35	
Occupation	Retired	12	15.5	14	P=0.23
	Self-employed	31	40.3	20	
	Employee	4	5.2	8	
Educational level	Under diploma	38	49.4	34	P=0.18
	Diploma	32	41.5	28	
	Academic degree	7	9.1	15	

Table 2. Comparison of mean vital signs of patients before and after the intervention between the two groups

Variables	Time	Intervention Group		Control Group		Independent-Samples t-test		
		Average	Standard deviation	Average	Standard deviation	t	df	p
Temperatures	Before the intervention	37.05	0.23	37.08	0.33	0.53	152	0.53
	After the intervention	36.72	0.33	37.08	0.30	7.04	152	>0.001
Heart beat	Before the intervention	85.53	24.64	89.88	21.53	1.16	152	0.24
	After the intervention	74.79	21.97	88.35	20.14	3.99	152	<0.001
Number of breaths	Before the intervention	20.05	3.12	20.27	2.81	0.46	152	0.64
	After the intervention	17.88	2.44	19.06	2.70	2.84	152	0.005
Systolic blood pressure	Before the intervention	130.05	30.23	125.57	28.92	0.94	152	0.34
	After the intervention	116.12	16.74	128.32	23.53	2.84	152	0.005
Diastolic blood pressure	Before the intervention	87.06	23.45	84.38	19.04	0.77	152	0.43
	After the intervention	75.81	1.62	84.10	15.15	-3.32	152	0.001
Arterial oxygen saturation	Before the intervention	96.57	1.33	96.66	1.26	-0.43	152	0.66
	After the intervention	98.49	0.91	96.31	0.89	15.00	152	0.001

Table 3. Comparison of time spent for weaning, number of re-intubation, and family satisfaction between the two groups

Variable	Intervention (n=77)	Control (n=77)	Statistical test
Time spent for weaning	5.00±2.07	6.19±2.54	P=0.002 t=3.19 Df=152
Re-intubation	1.50±0.050	1.72±0.44	P=0.005 t=2.87 Df=152
Satisfaction with performance of medical staff	977.27±62.19	933.44±60.91	P=0.001 t=4.41 Df=152
Convenience assessment	884.74±57.80	755.84±73.99	P=0.001 t=12.04 Df=152
Decision- making	372.27±69.91	301.23±61.34	P=0.001 t=6.67 Df=152
Total satisfaction score	2234.74±129.91	1991.23±107.43	P=0.001 t=12.67 Df=152

DISCUSSION

The present study was done to determine the effect of family presence on success of weaning from mechanical ventilator in patients admitted to ICUs. Based on the results obtained from this study, in the intervention group, vital signs (heart rate, systolic and diastolic blood pressure, temperature, pulse oximetric saturation, and aspiration rate) were significantly better than the control group after the intervention ($P < 0.05$). Thus, it can be said that the planned presence of family on the patients' bed admitted to the ICU is effective in improving their vital signs. In this regard, Yekefallah et al. in a study on determining the effect of hand touch on vital signs of patients with traumatic brain injury admitted to the ICU of medical centers in Qazvin City (Qazvin Province, Iran) announced that touching patients' hands for 5 minutes caused a significant reduction in systolic and diastolic blood pressure and aspiration rate, but it did not have a significant effect on patients' temperature (22). Nobahar and Bolhasani conducted a clinical trial on all eligible patients under two conditions of being present on the patient's bed with or without touching their wrist for 5 minutes. Their results showed that touching in restless patients undergoing mechanical ventilation can be considered as a suitable solution in controlling and stabilizing vital signs (23).

Yousefi et al., in a research on the effect of stimulation through touching by the family announced that stimulation by touching had a significant effect on increasing pulse oximetric saturation in patients admitted to the ICU (24). But, inconsistent with the present study, Rezaie et al. conducted a study on determining the effect of

the planned visits by family members of patients admitted to ICU on their physiological indicators and declared that the planned visits did not have a significant effect on improving physiological indicators of these patients (25). The results of the study by Mehrnejad et al. showed that the patient's visit by family members did not change serum level of cortisol and physiological indicators of patients admitted to the ICU (26). Contradictions in the previous findings can be justified by the factors including research environment and time, content and type of intervention as well as different conditions of patients as the most important reasons. It is noteworthy that the present study was performed by managing the condition and selecting the patients who were undergoing the mechanical ventilation. Given that in many studies, the effect of family presence on vital signs and physiological indicators of ICU-hospitalized patients has been confirmed, so in the present study, it can be claimed that this intervention is effective, but due to inconsistent studies, it seems that more studies are needed in this regard.

Another finding of the study showed that the presence of family in a planned manner on the patients' bed admitted to the ICU had an effect on the time spent on weaning and significantly reduced it. Safaeepour et al. in a study investigated the effect of family-based interventions and showed that the duration of weaning for the patients in intervention group was 97 minutes less than the control group (18). Similarly, results of a study by Happ et al. showed that the presence of family members in support of family-centered care is effective on reducing duration of weaning, its success rate, and reducing mortality of patients undergoing mechanical ventilation (15). Abbasi et

al. (27) and Salmani (8) considered the use of the structured protocols as effective in shortening duration of mechanical ventilation and patients' stay in the ward as well as reducing unsuccessful extubation. In our best knowledge, there was no previous similar study in the literature to compare the results, but by reviewing the mentioned studies, it can be said that the family presence can positively influence patients' physiological indicators that can be effective in this field and reduce duration of weaning. Therefore, it is suggested to investigate the effects of facilities, conditions, and environment on patients admitted to the ICU in the future studies.

The results also showed that the presence of family in a planned manner on the patients' bed admitted to the ICU had an effect on number of re-intubations and significantly reduced it. Rocha et al. conducted a systematic review and after reviewing 9 studies, they declared that the use of holistic nursing interventions and the presence of family members have a significant effect on success rate of this process (28).

Naseri-Salahshour et al. in a clinical trial study on 96 patients undergoing esophagogastroduodenoscopy showed that family presence significantly led to reduction of patients' anxiety (29).

Another result of this study was that the presence of family in a planned manner on the patients' bed admitted to the ICU had an effect on family satisfaction and significantly improved it. Farzadmehr et al. in a study investigated effectiveness of nursing counseling designed from the time of admission to discharge along with the presence of the patient's family member in reducing anxiety and increasing family satisfaction of the patients admitted to the ICU of cardiac surgery (30). Aslan and Esmaili, in a systematic review study showed that one of clinical consequences of family-centered care and the presence of family members on the patients' bed undergoing coronary artery surgery was an increase in family satisfaction (31). McCabe mentioned the beneficial effects of family members' presence on patients' beds, and pointed to one of its results as increasing and promoting family satisfaction (32).

Dolatyari et al. found that one of the important items influencing family satisfaction from the perspective of patients' family members was participation of family members in process of treatment and patients' care that obtained a low score (19), which is in line with the findings of the present study. The patient's family members witness comprehensive efforts and aids of the nurses and other treatment staff through being present on the patient's bed and they would be happy to be supported and respected by the nurses. On the other hand, since they have been able to help the patient with their supportive cares, they also feel satisfied. Family-based interventions, involving them during treatment, especially being present on the patient's bed, and supervising work cause an increase in reassurance, sense of acceptance by the treatment staff, and a decrease in anxiety, justifying promotion of satisfaction.

CONCLUSION

Finally, our findings revealed that the presence of family in process of weaning of patients admitted to the ICU led to improvement of their vital signs and physiological indicators and while promoting family satisfaction, it reduced the time spent for intubation and number of re-intubation in these patients. Therefore, it is suggested to provide supportive strategy of family presence in coordination with members of the treatment team to help the patients admitted to the ICU in order to reduce length of hospitalization of these patients and also decrease burden of emotional and economic costs on the patient, family, and healthcare systems.

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REFERENCES

- Chaiwat O, Sarima N, Niyompanitpattana K, Komoltri C, Udomphorn Y, Kongsayreepong S. Protocol-directed vs. physician-directed weaning from ventilator in intra-abdominal surgical patients. *J Med Assoc Thai* 2010;93(8):930-6.
- Keykha A, Khoshfetrat M, Dahmardeh AR, Dashipour A, Dahmardeh M, Sarhadi A. Success rate of weaning from mechanical ventilation in patients admitted to the intensive care unit with utilization burn's wean assessment program. *Archives of Anesthesiology and Critical Care* 2017;3(2):319-23.
- Newth CJ, Hotz JC, Khemani RG. Ventilator Liberation in the Pediatric ICU. *Respir Care* 2020;65(10):1601-10.
- Asgari M, Soleimani M. Intensive nursing care in ICU, CCU and dialysis. 33th, editor. Tehran: Boshra Publication; 2020. 692 p.
- Hetland B, Lindquist R, Chlan LL. The influence of music during mechanical ventilation and weaning from mechanical ventilation: A review. *Heart Lung* 2015;44(5):416-25.
- Dehvan F, Soleimani M, Ghanei Gheshlagh R. Weaning indices of mechanical ventilator: an integrative review of the national published articles. *Scientific Journal of Nursing, Midwifery and Paramedical Faculty* 2019;5(2):1-3.
- Basiri R, Malekzadeh J, Mazloom SR, Derogari M. Comparison between CROP and Rapid Shallow Breathing index as predictors of weaning in predicting the outcome of discontinuation from mechanical ventilation in ICU patients. *Medical Journal of Mashhad University of Medical Sciences* 2018;61(1):825-35.
- Salmani F. The effect of discontinuation protocol on the duration of mechanical ventilation. *Iran Journal of Nursing* 2013;26(82):62-73.
- Cottureau A, Robert R, le Gouge A, Adda M, Audibert J, Barbier F, et al. ICU physicians' and nurses' perceptions of terminal extubation and terminal weaning: a self-questionnaire study. *Intensive Care Med* 2016;42(8):1248-57.
- Merchán-Tahvanainen ME, Romero-Belmonte C, Cundín-Laguna M, Basterra-Brun P, San Miguel-Aguirre A, Regairamartínez E. Patients' experience during weaning of invasive mechanical ventilation: A review of the literature. *Enferm Intensiva* 2017;28(2):64-79.
- Chatterjee S, Wright SM. "Principles" Guiding Our Medical ICU. *Crit Care Explor* 2021;3(1):e0322.
- Roh JH, Synn A, Lim CM, Suh HJ, Hong SB, Huh JW, et al. A weaning protocol administered by critical care nurses for the weaning of patients from mechanical ventilation. *J Crit Care* 2012;27(6):549-55.
- Ghiani A, Paderewska J, Sainis A, Crispin A, Walcher S, Neurohr C. Variables predicting weaning outcome in prolonged mechanically ventilated tracheotomized patients: a retrospective study. *J Intensive Care* 2020;8:19.
- Hung MS, Pang SM. Family presence preference when patients are receiving resuscitation in an accident and emergency department. *J Adv Nurs* 2011;67(1):56-67.
- Happ MB, Swigart VA, Tate JA, Arnold RM, Sereika SM, Hoffman LA. Family presence and surveillance during weaning from prolonged mechanical ventilation. *Heart Lung* 2007;36(1):47-57.
- Williams BR, Lewis DR, Burgio KL, Goode PS. "Wrapped in their arms": next-of-kin's perceptions of how hospital nursing staff support family presence before, during, and after the death of a loved one. *Journal of Hospice & Palliative Nursing* 2012;14(8):541-50.
- Hadian Shirazi Z, Sharif F, Rakhshan M, Pishva N, Jahanpour F. Lived Experience of Caregivers of Family-Centered Care in the Neonatal Intensive Care Unit: "Evocation of Being at Home". *Iran J Pediatr* 2016 Jul 26;26(5):e3960.
- Safaepour L, Mokhtari Nouri J, Moradian ST, Saied Ghiasi S. The Effect of Family-Centered Care on the Duration of Weaning From Mechanical Ventilation in Coronary Artery Bypass Surgery Patients: A Clinical Trial Study. *Critical care nursing* 2017;10(2):e10655.
- Dolatyari A, Zareiyani A, Tadrissi SD. Family satisfaction with care in the intensive care unit: Results of a multiple center study in selected military hospitals. *Military Caring Sciences Journal* 2014;1(1):18-26.
- Heyland DK, Tranmer JE; Kingston General Hospital ICU Research Working Group. Measuring family satisfaction with care in the intensive care unit: the development of a

- questionnaire and preliminary results. *J Crit Care* 2001;16(4):142-9.
21. Dolatyare A, Sharififar S, Zareyan A, Tadrissi SD. Translation and validation of family satisfaction questionnaire of adult patients hospitalized in Intensive Care Units. 2015.
 22. YekeFallah L, Azimian J, Aghae F, Alipour Heidari M, Hasandoost F. Effect of hand tactile stimulation on the vital signs of brain injury patients hospitalized in Qazvin intensive care units, Iran. *Journal of Inflammatory Diseases* 2018;22(4):13-21.
 23. Nobahar M, Bolhasani M. The effect of touch on the vital signs of agitated patients undergoing mechanical ventilation: an interventional study. *Nursing And Midwifery Journal* 2015;12(10):899-907.
 24. Yousefi H, Naderi M, Daryabeigi R. The effect of sensory stimulation provided by family on arterial blood oxygen saturation in critical care patients. *Iran J Nurs Midwifery Res* 2015;20(1):63-8.
 25. Rezaie H, Sadeghi T, Abdoli F. The effects of scheduled visitation on the physiological indices of conscious patients admitted at intensive care units. *Evidence Based Care* 2016;5(4):33-40.
 26. Mehrnejad N, Ganji T, Ardeshiri M, Fathi P. The effect of family presence at the bedside on serum cortisol levels and physiological indexes in patients hospitalized in intensive care unit. *Iranian Journal of Cardiovascular Nursing* 2014;2(4):36-42.
 27. Abbasi M, Mohammadi E, Sheaykh Rezayi A. 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. *Jpn J Nurs Sci* 2009;6(1):21-6.
 28. Rocha MB, Poeira AF, Flamino R. Nursing interventions in the extubation process: a scoping review. *Int Phys Med Rehab J*. 2020;5(6):258-63.
 29. Naseri-Salahshour V, Taher M, Karimy M, Abedi A, Fayazi N, Sajadi M, et al. The effect of presence of family members on the anxiety level of candidates for esophagogastroduodenoscopy: A randomized controlled trial. *Med J Islam Repub Iran* 2019;33:62.
 30. Farzadmehr M, Fallahi Khoshknab M, Hosseini MA, Khankeh HR. The effect of nursing consultation on anxiety and satisfaction of patient's family in cardiac surgical intensive care unit. *Iranian Journal of Psychiatric Nursing* 2016;4(2):57-64.
 31. Aslan A, Esmaeili M. Role of Patient-family-centered care in coronary artery bypass surgery patient's improvements in coronary artery bypass surgery patient's improvements. *Iranian Journal of Cardiovascular Nursing* 2018;7(2):68-78.
 32. McCabe M. Impact of family presence in the healthcare setting: Liberty University 2014.