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Impact of Family-Centered Orientation Program on Hemodynamic Indices and Hospitalization Duration in Coronary Artery Disease Patients

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ABSTRACT

Background: Hospitalization in cardiac care unit (CCU) results in much anxiety followed by changes in hemodynamic indices in most patients. The accompanying family members play an important role in patient's care and support. Therefore, the current study was performed to determine the impact of family-based training programs on hemodynamic indices and duration of hospitalization for patients with coronary artery disease.

Methods: The population of this clinical trial study consists of patients with coronary artery disease hospitalized in CCU of an educational hospital in Zanjan, Iran in 2013. Eighty patients were selected through convenience sampling method, and were randomly assigned into the two groups of intervention and control. The family-based training program for the intervention group was executed as three 40-60 min sessions of face-to-face meeting with the patients and the core accompanying family member. Mean hemodynamic indices of the patients including systolic and diastolic blood pressures, average arterial blood pressure, and heart rate were measured and recorded on days one to four of the hospitalization based on the hospitalization duration. Data analysis was performed by Chi-square, independent t-test, and repeated measures ANOVA.

Results: Post-intervention, the hemodynamic indices and hospitalization duration were lower in the intervention group compared to the controls. However, this difference was significant for heart rate ($P<0.001$), respiratory rate ($P=0.002$), and hospitalization duration ($P<0.001$).

Conclusion: Family-based training programs are recommended as a cost-benefit method in CCU.

1. Introduction

Cardiovascular diseases are considered as the most common mortality reason throughout the world.[1, 2] According to the statistics presented by the World Health Organization (WHO), 17.7 million people expired due to cardiovascular diseases in 2015, about 7.4 million of which being coronary artery disease (CAD).[3]

CAD with a wide clinical range from ischemia without symptoms to sudden death is the most prevalent cause of hospitalization.[1, 2, 4] It is known as a condition accompanied by stress and anxiety,[5, 6] and stress might be due to heart attack, hospitalization, unfamiliar environment of the hospitals, and encountering the various medical equipment.[7]

Hospitalization could even result in high levels of depression, anxiety, and stress in the family members of the patient,[8] which all could cause them not to comprehend the information properly. All the mentioned problems affect the family member who is accompanying the patient and lead in reduced support and augment the patient's stress.[9] The anxiety might be related to lack of knowledge and comprehension, and the patient feels it as adaptation anxiety and disagreeable excitement, which usually presents as alterations in some hemodynamic indices. Changes in these indices could be very threatening in cardiac patients and

results in decreased resistance of the patients during the treatment process and increases the lethal consequences of the disease.[10-12] Therefore, the patient's family is among the important elements of patient care, and plays a critical role in controlling the patient's anxiety.[13, 14] Consequently, anxiety management by the nurses and other health care personnel is vital for adjusting the hemodynamic variables.[10, 11, 15]

Several studies have mentioned the effective role of the patient's family members in providing a desirable care. They have considered the family as a factor of which reduces the negative impacts of hospitalization, guaranties the managements' sufficiency, and provides comfort and improved support for the patient.[16]

Vahedian-azimi et al. (2015) have introduced the involvement of family members as an influential factor on different physical and psychological aspects of the patient's life.[17] Ghavidel et al. (2015) have also stated that social support, especially providing information for the family members of the patients under coronary artery bypass grafting ameliorates the patient's quality of life.[18] As a result, family-centered orientation programs are valuable options in training, treatment, and follow-up.[5, 19, 20] Despite the enormous importance of controlling the hemodynamic indices in cardiac patients and the considerable role of the family in backing up the patient, few evidences regarding the influence of family training on hemodynamic variables of the patients were retrieved. Therefore, the current study was performed to evaluate the effect of family-centered orientation program on hemodynamic indices and hospitalization duration of the CAD patients in cardiac care unit (CCU).

2. Methods

2.1. Design

The study population of this clinical trial research consisted of patients with CAD hospitalized in CCU of a teaching hospital in Zanjan, Iran in 2013.

2.2. Participants and setting

The sample size was calculated as 59, based on the pilot study on two groups of ten patients and using the following formula:

$$N=\frac{(Z_{1-\frac{\alpha}{2}}+Z_{1-\beta})^2(S_1^2+S_2^2)}{(X_1-X_2)}$$

In which $\alpha=0.05$, $Z_{1-\beta}=1.64$, $Z_{1-\alpha/2}=1.96$, $X_1-X_2=1.5$, $S_2^2=5.289$, $S_1^2=1.567$.

In order to enhance the validity and also to consider the drop-out, total of 80 participants were selected through convenience sampling. Coin tossing was used for random assignment of the patients into the two groups of intervention and control, as the heads side was allocated to the intervention group and the tails side to the controls.

The inclusion criteria entailed: 1) age range of 35-80, 2) history of current heart attack (except extensive myocardial infarction) or unstable angina pectoris, 3) consciousness and talking ability, 4) stable hemodynamic condition confirmed by the doctor, 5) pain relief reported by the patient, 6) lack of CCU hospitalization history according to the medical documents and patient's statements, 7) normal sinus rhythm (NSR), and 8) lack of dysrhythmias, which are effective on hemodynamic condition of the patient such as alternate premature ventricular contractions (PVC), alternate premature atrial contractions (PAC), atrial fibrillation (AF) with high rate and paroxysmal supraventricular tachycardia (PSVT), and cardiac arrests with bradycardia according to the doctor and the recorded information.

Besides, the inclusion criteria for the patient's family members comprised being literate, and having close relations with the patient (mostly the patient's life) based on the patient's statements.

The exclusion criteria included: 1) change in physiological condition of the patient and compulsion for taking vasoactive medication (e.g. dopamine, dobutamine, epinephrine, and atropine), 2) cardiopulmonary resuscitation during the study, 3) cardiogenic shock, 4) pulmonary edema, 5) reduced communication ability, 6) irregular participation in the held classes, 7) discharge in less than four days, and 8) patient expiration. In addition, absence of the family members in the training sessions was considered as the exclusion criterion for them.

2.3. Instruments

Demographic and clinical characteristics form, hemodynamic condition and hospitalization data form, guideline for family-centered orientation program, and monitoring system were utilized in this study.

The demographic and clinical characteristics form encompasses the age, gender, chronic disease (e.g. diabetes, high cholesterol, and hypertension), smoking, hospitalization in other departments, any diagnosed disease, and drug history (such as nitrate, beta-blockers, calcium-blockers, angiotensin-converting enzyme (ACE) inhibitors, and diuretics).

The hemodynamic condition and hospitalization form included systolic and diastolic blood pressures, mean arterial pressure (MAP), heart and respiratory rates, and the duration of hospitalization.

A guideline was prepared for executing the orientation program, so that all the items were performed orderly and similarly for all the samples of the intervention group. This guideline contained various subjects regarding different parts of the unit, the meeting time and type, diet, amount of activity, self-care, using the rail beside the bed, the medications, and the common procedures of the unit.

Nurses and professional professors of cardiac nursing were involved in preparation of the guideline, and it was finally compiled by the authors as an organized guideline for uniform execution of the program. The validity of this guideline was checked through demonstrating to ten experts and professors of Zanjan University of Medical Sciences, Iran, and the needed modifications were exerted.

The monitoring systems of CCU were from Saadat Co. and all had been calibrated by medical engineers at the beginning of the study and their proper working was confirmed. The heart rate, and systolic and diastolic blood pressures were recorded after monitoring, and MAP was calculated and recorded by one of the researchers using the following formula.[21]

MAP=(systolic pressure+diastolic pressure×2)/3

In order to assess the validity of the monitoring systems, blood pressure was also measured once a day by sphygmomanometer (Riester, Germany, imported by Paykar Bonyan Teb Co., Iran) and heart rate was examined through counting the heart sound by stethoscope (Riester, Germany, imported by Paykar Bonyan Teb Co., Iran) by one of the researchers. The results for both variables were compared with those indicated by the monitoring system. Pearson correlation coefficient showed correlation of 95% between the values recorded on the monitoring system and those obtained by the researcher.

2.4. Data Collection

At the time of reception, the demographic information of the patients and their accompanying people were received by the researcher (the first author) through the demographic form for both intervention and control groups.

Orientation program began for the intervention group when the patient reported pain relief and the hemodynamic condition was stable (i.e. little alterations in hemodynamic indices and lack of symptoms such as decreased consciousness level, angina pectoris, and dyspnea). The control group just received the routine care including advices at reception given by the nurse about motion limits and the diet.

Time of initiating the intervention varied depending on physiological conditions and the reception time of each patient, which was almost 12-24 h after reception (the second study day). Afterwards, 40-60 min of bedside training was given to each patient in presence of a family member according to the guideline for family-centered orientation program.

Finally, the patient and the accompanying person were provided a handbook named "Handbook of Familiarization with the Hospitalization Process in CCU". The handbook contained all the taught information and could reply any ambiguity and problem regarding the orientation program in the follow-up period.

During the hospitalization period in CCU, one researcher met each patient and one of the family members and gave the required advice if any new procedure was considered for the patient. The number of training sessions was two to three depending on the learning of the patient and the accompanying person as well as the performed procedures for him/her.

In order to prevent data bias, the hemodynamic indices were recorded by a research assistant who was not aware of the study groups. Therefore, the hemodynamic variables of the patients were controlled and recorded every hour by that research assistant in both groups two hours after reception (the first day of hospitalization) as pre-test, and also on days 2-4 of hospitalization as post-test. Lastly, mean of each hemodynamic variable was recorded for that day, and number of the days hospitalized in CCU was also recorded on the day of discharge (Diagram 1).

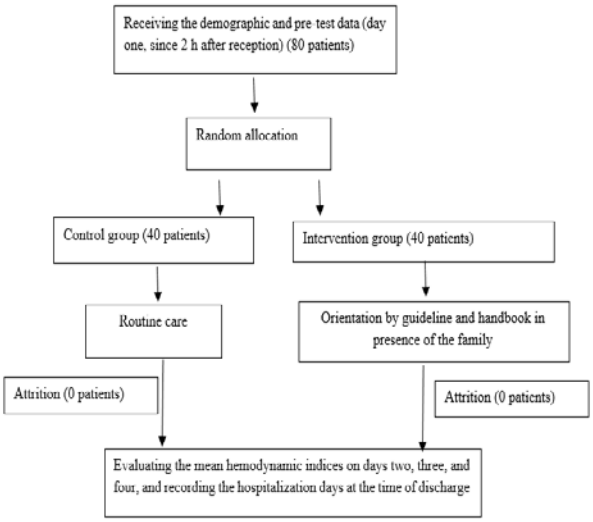

Diagram 1. Study execution steps

2.5. Ethical Considerations

Firstly, the aim of this study was clarified for the participants (the patients and their family members) by one of the researchers, and written consents were taken if they agreed. The participants were also ensured about confidentiality of their information and it was explained that they could leave the study whenever they wanted. The study was performed following the ethical approval with the code of ZUMS.REC.1392.52 taken from the Ethics Committee of Zanjan University of Medical Sciences, Iran.

2.6. Statistical Analysis

In addition to the descriptive analysis, the Chi-square test was used to evaluate the difference of demographic characteristics between the two groups of intervention and control. The independent t-test was also utilized for making comparison between the two groups regarding the mean age and hemodynamic indices.

Moreover, in order to assess the trend of alterations in hemodynamic indices during the study period, the repeated measures ANOVA test was applied. All the statistical analysis was performed using the SPSS version 16, and P-value of less than 0.05 was considered as significant.

3. Results

The demographic data of the patients is shown in Table 1. Following this table, no significant difference was observed between the two groups regarding these characteristics. Furthermore, the patients of the two groups were similar concerning taking the medications, which are effective on hemodynamic indices (e.g. nitrates, beta-blockers, calcium-blockers, ACE inhibitors, and diuretics).

According to Table 2, all the hemodynamic indices declined significantly post-intervention in the test group compared to pre-intervention. Moreover, following the results of Bonferroni post-hoc test, all the hemodynamic variables were significantly different between the pre- and post-intervention times (day one to four of hospitalization) ($P<0.05$), while these differences were not statistically significant in the control group ($P>0.05$).

The difference between the two groups was significant regarding the heart and respiratory rates, and hospitalization duration. The results of independent t-test demonstrated that the mean length of hospitalization was 4.6 ± 0.982 and 3.9 ± 0.672 days in control and intervention groups, respectively which are significantly different ($P<0.001$). Figure 1 indicates the trend of alterations in hemodynamic variables during the days one to four in both groups.

Table1. Demographic and clinical characteristics of the participants in the control and intervention groups

Groups	Variables	Intervention N(%)	Control N(%)	P-Value
Gender	Female	22(55)	17(42.5)	0.371*
	Male	18(45)	23(57.5)	
Diabetes history	Positive	4(10)	7(17.5)	0.51*
	Negative	36(90)	33(82.5)	
Cholesterol history	Positive	13(32.5)	14(35)	0.72*
	Negative	27(67.5)	26(65)	
Hypertension history	Positive	14(35)	16(40)	0.81*
	Negative	26(65)	24(60)	
Smoking	Positive	10(25)	13(32.5)	0.62*
	Negative	30(75)	27(67.5)	
Hospitalization history in other units	Positive	18(45)	22(55)	0.5*
	Negative	22(55)	18(45)	
Disease diagnosis	Angina pectoris	23(57.5)	23(57.5)	1*
	Myocardial Infarction	17(42.5)	17(42.5)	
Age	Mean ± SD	59.1±12.4	63.9±10.9	0.06**

*Chi-square test; **Independent t-test

Table 2. Comparison between the mean hemodynamic indices of the patients pre- and post-intervention in the control and intervention groups

Time	Variable	Pre-intervention	Post-intervention			P*
		Day one Mean ± SD	Day two Mean ± SD	Day three Mean ± SD	Day four Mean ± SD	
Systolic blood pressure	Intervention	131.8±15.9	129.2±18.6	127.6±16.9	129.02±18.6	0.004
	Control	126.1±17.8	126.5±16.5	124.9±14.5	124.8±13.9	0.09
	P**	0.136	0.495	0.452	0.254	
Diastolic blood pressure	Intervention	95.3±16.5	94.8±17.4	94.1±17.1	94.6±17.3	0.003
	Control	88.6±16.2	89.4±15.9	88.1±14.4	89±15.1	0.48
	P**	0.071	0.15	0.094	0.123	
MAP	Intervention	107.5±16.1	106.3±17.6	105.3±16.7	106.1±17.5	0.02
	Control	101.1±16.5	101.8±15.9	100.3±14.2	100.9±14.3	0.4
	P**	0.085	0.234	0.162	0.152	
Heart rate (per min)	Intervention	72.5±11.006	63.1±8.3	63.4±8.4	63.1±8.4	<0.001
	Control	73.02±13.6	71.5±9.1	71.6±9.1	71.3±8.9	0.61
	P**	0.872	<0.001	<0.001	<0.001	
Respiratory rate	Intervention	16.2±3.01	15.1±1.3	15.2±1.5	15.02±1.4	0.01
	Control	16.4±2.5	16.2±1.2	16.2±1.4	16.05±1.3	0.23
	P**	0.778	<0.001	0.008	0.002	

*Repeated measures analysis, **Independent t-test

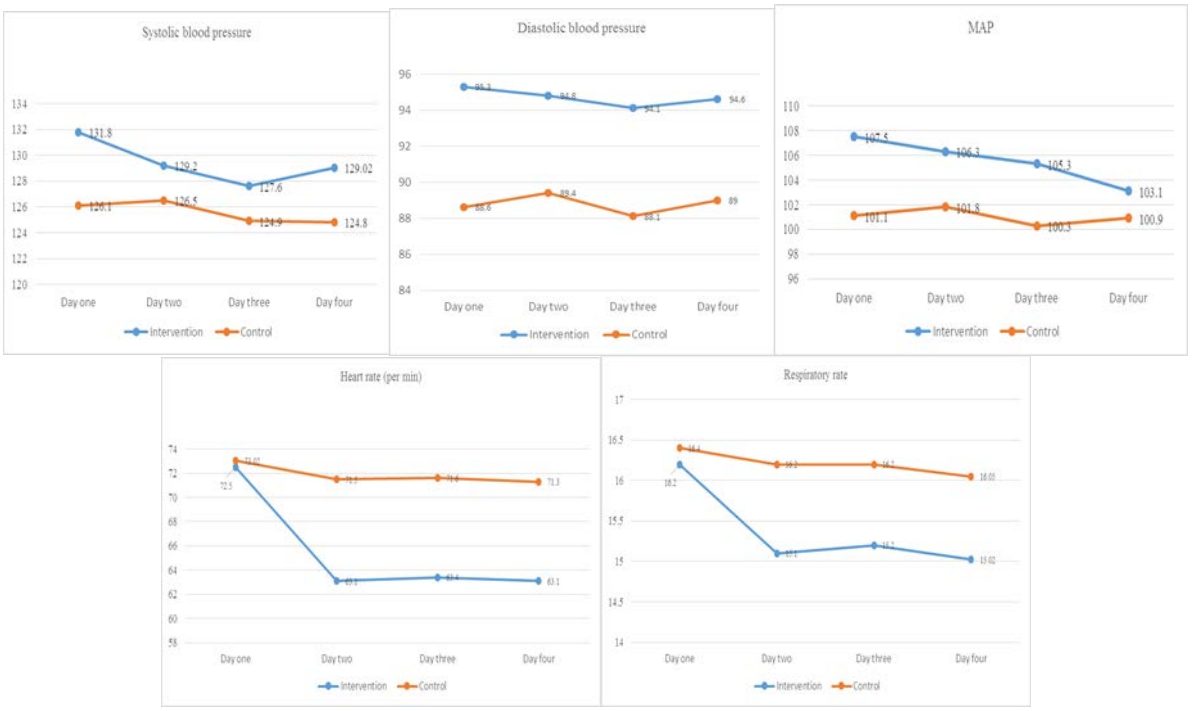

Figure 1. Trend of changes in hemodynamic indices during the days one to four in the two groups of intervention and control

4. Discussion

Following the findings of this study, the family-centered orientation program could significantly reduce the mean heart and respiratory rates in the intervention group compared to the control group.

Dehghani et al. (2013) reported that fear from the unknowns, leads in elevated hemodynamic indices including blood pressure, and heart and respiratory rates through stimulation of spontaneous nervous system.[22] It seems that the decreasing trend of hemodynamic indices in the case group of the current study is due to reduction in fear and anxiety of the patients as the result of applying the family-centered orientation program during hospitalization in CCU.

Consistent with the present study, Hanifi et al. (2011) concluded that executing orientation program in patients under cardiac catheterization results in reduced hemodynamic indices (systolic and diastolic blood pressures, heart and respiratory rates pre-, during, and post-catheterization) in the participants of the case group.[12] Although all the hemodynamic indices had significantly decreased in the intervention group in a study conducted by Hanifi et al.; in the present study the significant difference was observed between the two groups just for mean heart and respiratory rates during three days. This difference might be the result of more

unfavorable condition of the patients in the current study.

Despite lack of significant difference regarding systolic and diastolic blood pressures, and MAP between the two groups, the intra-group impact of the intervention was positive. It seems that the patients' anxiety in the intervention group has declined following the improved information providing about the diagnostic methods, treatments, and care; in which the most prominent effect of them has been on the heart and respiratory rates. Azimi lolati *et* al. (2014) also demonstrated that visits by family members and friends resulted in decreased heart and respiratory rates, and higher oxygen saturation in the patients hospitalized in CCU.[19] In the current study, presence of the patient's family allowed better understanding and orientation when the information was given. The reason was that whenever the researcher observed misunderstandings of the subject, it was asked to repeat the training by the family member. In some studies, the aim of family-centered trainings was further than adaptation and they even state that the family-centered training might enhance the patient's overall knowledge. For example, results of the study conducted by Chien *et* al. in 2006 indicated that people who had received the trainings with their families accompany, regarding the needs after hospitalization in CCU , had a remarkable knowledge difference compared to the control group.[23]

Hospitalization duration was another variable evaluated in this study, which was revealed to be significantly lower in the case group compared to the controls. In the study performed by Koelling *et* al. (2005), consistent with the current study, training at the time of discharge could improve the therapeutic results such as reduced hospitalization duration in heart failure patients.[24] Indeed, it could be concluded that training affects the patients' knowledge and attracts them to get involved in the treatment process resulting in shortened hospitalization. In the current study, it seems accompaniment of the patient and family might permit the patients to review the trained subjects in case of forgetting. Consequently, the patients are enabled to complete the treatment process, and are discharged earlier. Contrary to the findings of the current study, Zolfaghari *et* al. (2012) found that multifactorial intervention did not affect the hospitalization duration of the open-heart surgery patients.[25] However, it worth to note that various factors including patient's characteristics (age, gender, economic, social, and educational status), disease characteristics (e.g. patients with chronic diseases experience longer hospitalizations), and hospital characteristics (in educational and research hospitals the length is longer) influence the hospitalization duration in cardiac patients.[26] All the mentioned factors could be the reasons for different results of the current study and research of Zolfaghari *et* al.

Inclusion of the patients with any kind of myocardial infarction (except extensive MI) in this study could be considered as a limitation, which affects the results.

5. Conclusion

Results of the current study demonstrated that executing the family-centered orientation program has a significant controlling effect on the heart and respiratory rates, and hospitalization duration of the CAD patients in CCU. Therefore, it could be suggested as a simple and effective method to be applied by the nurses in order to stabilize the hemodynamic indices and reduce the hospitalization duration in CCU. For the future studies, it is recommended to match the control and intervention groups regarding the MI types. Moreover, it is suggested to evaluate the patients' anxiety in addition to the hemodynamic indices and assess the relationship between these two variables as well.

Conflicts of interest

The authors declare no conflicts of interest.

Authors' contributions

Vahideh Karimi: Study design, data collection, data analysis, article preparation. Nasrin Hanifi: Study design, data analysis, scientific edit, preparation and final confirmation of the article. Nasrin Bahraminezhad: Cooperation in article preparation. Soghrat Faghihzadeh: cooperation in data analysis.

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References

1. Gersh BJ, Sliwa K, Mayosi BM, Yusuf S. Novel therapeutic concepts the epidemic of cardiovascular disease in the developing world: global implications. European Heart Journal 2010; 31(6): 642-8.
2. Namayandeh SM, Sadr SM, Ansari Z, Rafiei M. A cross-sectional study of the prevalence of coronary artery disease traditional risk factors in Yazd urban population, Yazd healthy heart project. Iran Cardiovasc Research Journal 2011; 5(1): 7-13.
3. http://www.who.int/mediacentre/factsheets/fs317/en/.World Health Organization. http://www.who.int/mediacentre/factsheets/fs340/en.url>http://www.who.int/mediacentre/factsheets/fs241/en/</url. 2014 Nov.
4. Khodadadi A, Sayadi A, Smaeli H. Evolution of knowledge of the principles of self care in acute coronary syndrome patients admitted to Aliebn Abitaleb Rafsanjan university hospital during 2009. Community Health Journal 2010; 5(1): 8-16. [Persian]
5. Fumis RRL, Ranzani OT, Faria PP, Schettino G. Anxiety, depression, and satisfaction in close relatives of patients in an open visiting policy intensive care unit in Brazil. Journal of Critical Care 2015; 30(2): 440-446.
6. Hekmatpour D, Ebrahimi-Fakhar HR. Addressing disruption in family life: exploration of the perceived needs of the families of patients hospitalized in critical care units in Iran. Journal of Nursing Research 2015; 23(2): 118-24. [persian]
7. Hu R-f, Hegadoren KM, Wang X-y, Jiang X-y. An investigation of light and sound levels on intensive care units in China. Australian Critical Care 2016; 29(2): 62-7.
8. Sadock BJ, Sadock VA. Kaplan and sadock's synopsis of psychiatry: behavioral sciences/clinical psychiatry. 10th ed, Lippincott Williams & Wilkins; 2011.
9. Dunbar SB, Dougherty CM, Sears SF, Carroll DL, Goldstein NE, Mark DB, et al. Educational and psychological interventions to improve outcomes for recipients of implantable cardioverter defibrillators and their families: a scientific statement from the American heart association. Circulation 2012; 126(17): 2146-72.
10. Gharib A, Mohammad Khan Kermanshahi S, Hajizadeh E. The effect of orientation technique on vital sign and anxiety level of patients undergoing endoscopic retrograde cholangiopancreatography (ERCP). Evidence Based Care 2012; 2(3): 51-60. [Persian]
11. Arab M, Ranjbar H, HosseienRezaee H, Khoshab H. Assessment of the depression and anxiety in patients with acute coronary artery disease. Journal of Critical Care Nursing 2012; 4(4): 197-202. [Persian]
12. Hanifi N, Bahraminejad N, Dadgaran I, Amane S, Ahmadi F, Khani M, et al. Effect of orientation program on hemodynamic variables of patients undergoing heart catheterization. Journal of Hayat 2011; 17(3): 38-48. [Persian]
13. Guo P, East L, Arthur A. A preoperative education intervention to reduce anxiety and improve recovery among Chinese cardiac patients: a randomized controlled trial. International Journal of Nursing Studies 2012; 49(2): 129-37
14. Pourmemari M, Khaleghdoost Mohammadi T, Askandari F, Avazeh A. Study on effective factors on patients' family members anxiety in intensive care units. Journal of Zanjan University of Medical Sciences & Health Services 2010; 18(70): 91-101. [Persian]
15. Abdi H, Abbasi A, Asghari N. The effect of benson relaxation and aromatherapy on anxiety and physiological indicators in patients undergoing coronary angiography. Journal of Urmia Nursing And Midwifery Faculty 2015; 12(12): 1094-103. [Persian]
16. Hockenberry MJ, Wilson D. Wong's Nursing care of Infants and children. 9th ed. New York: Elsevier Health Sciences; 2013: 965.
17. Vahedian-azimi A, Alhani F, Goharimogaddam K, Madani SJ, Naderi A, Hajiesmaeili M. Effect of family-centered empowerment model on the quality of life in patients with myocardial infarction: A clinical trial study. Journal of Nursing Education 2015; 4(1): 8-22. [Persian]
18. Ghavidel A , Farokhnezhad-Afshar P, Bakhshandeh H, Ghorbanpuor F. Effect of family-centered education on the quality of life patients after coronary artery bypass graft surgery. Cardiovascular Nursing Journal 2015; 4(2): 1-10. [Persian]
19. Lolaty HA, Bagheri-Nesami M, Shorofi SA, Golzarodi T, Charati JY. The effects of family-friend visits on anxiety, physiological indices and well-being of MI patients admitted to a coronary care unit. Complementary Therapies in Clinical Practice 2014; 20(3): 147-51.
20. King G, Kertoy M, King S, Law M, Rosenbaum P, Hurley P. A measure of parents' and service providers' beliefs about participation in family-centered services. Children's Health Care 2003; 32(3): 191-214.
21. Miettola S, Hartikainen AL, Vääräsmäki M, Bloigu A, Ruokonen A, Järvelin MR, et al. Offspring's blood pressure and metabolic phenotype after exposure to gestational hypertension in utero. European Journal of Epidemiology 2013; 28(1): 87-98.
22. Dehghani H, Dehghani K, Nasiriani K, Banaderakhshan H. the Effect of familiarization with cardiac surgery process on the anxiety of patients undergoing coronary artery bypass graft surgery. Modern Care, Scientific Quarterly of Birjand Nursing and Midwifery Faculty 2014; 10(4): 257-263. [Persian]
23. Chien W-T, Chiu Y, Lam L-W, Ip W-Y. Effects of a needs-based education programme for family carers with a relative in an intensive care unit: a quasi-experimental study. International Journal of Nursing Studies 2006; 43(1): 39-50.
24. Koelling TM, Johnson ML, Cody RJ, Aaronson KD. Discharge education improves clinical outcomes in patients with chronic heart failure. Circulation 2005; 111(2): 179-85.
25. Zolfaghari M, Arbabi M, Pedram Razi S, Biat K, Bavi A. Effectiveness of a multifactor educational intervention on delirium incidence and length of stay in patients with cardiac surgery. Journal of Hayat 2012; 18(1): 67-78. [Persian]
26. Yaghoubi M, Karimi S, Ketabi S, Javadi M. Factors affecting patients'length of stay in Alzahra hospital based on hierarchical analysis technique. Health Information Management 2011; 8(3). 326-34. [Persian]

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