

Evaluation of the effects of the family-centered empowerment model on the nutrition style and physical activity of patients with asthma

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ABSTRACT

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Background: As the most prevalent chronic disease, asthma is associated with restrictions in the diet and physical activity of the patients. Patient empowerment and family support are the methods of choice for adapting to these limitations. This study aimed to evaluate the effects of the family-centered empowerment model on the nutrition style and physical activity of asthmatic patients.

Methods: This clinical trial was conducted on 70 patients with asthma referring to a hospital in Zabol, Iran in 2015. Samples were selected via randomized convenience sampling and divided into two groups of intervention and control. Family-centered empowerment model was implemented in the intervention group in five educational sessions (45 min each) twice a week. Data were collected using a researcher-made nutritional assessment scale and Beck's physical activity questionnaire during four stages before the intervention, as well as one week, one month and three months after the intervention. Data analysis was performed in SPSS version 16 using descriptive statistics, Chi-square, repeated measures ANOVA, Friedman's test, independent t-test, and Mann-Whitney U test.

Results: Mean score of nutrition style significantly increased from 44.59 ± 2.43 to 26.74 ± 6.25 in the intervention group after the training sessions ($P < 0.001$). Moreover, a significant increase was observed in the mean score of physical activity after the intervention (24.06 ± 3.27) compared to before the intervention (31.20 ± 3.06) ($P < 0.001$). This difference was significant between the groups, with the exception of a one-month interval after the intervention ($P < 0.05$).

Conclusion: According to the results of this study, implementation of the family-centered empowerment model significantly improved the nutrition style and physical activity of asthmatic patients. Therefore, it is recommended that this model be employed by nurses in different hospital wards.

1. Introduction

Asthma is the most prevalent chronic disease with debilitating effects on the health of millions of children and adults across the world.¹ As a chronic inflammatory disease, asthma is associated with airway hyperresponsiveness and inflammation, which lead to recurrent episodes of wheezing, shortness of breath and coughing, especially in the early morning and at night.²

According to a study by Stanojevi et al. (2012), 300 million patients suffer from asthma in different regions of the world, and this rate is expected to reach 33% and 400 million patients by 2025.³

Statistics suggest that the prevalence of asthma is 1.5-5.7% in Iran.⁴ If uncontrolled, the mortality rate of asthma is predicted to rise by 20%.⁵

Several factors are involved in the incidence of asthma its complications, the most important of which are reduced daily physical activities and poor nutrition.^{6, 7} In this regard, findings of Yektatalab et al. (2014) were indicative of inadequate physical activity in asthmatic patients, which gave rise to various psychological disorders, such as anxiety and depression, in the patients.⁸ On this theme, scientific evidence suggests that lack of physical activity, malnutrition, and the subsequent obesity might decrease the depth of breathing, leading to the narrowing of airways and reduced diaphragm

flexibility. Therefore, increasing physical activity and enhancing nutritional habits could improve clinical and physiological pulmonary indications in patients with asthma, thereby resulting in weight loss.⁶ On the other hand, food allergies have been proposed as a major contributing factor for asthma attacks (e.g., shortness of breath and wheezing).⁹ As such, proper nutrition style and dietary habits play a pivotal role in maintaining the health status of asthmatic patients. Confirming the mentioned findings, Karimi *et al.* (2011) reported that training of families on the appropriate patterns of food consumption leads to the effective alleviation of asthma symptoms in the patients.¹⁰ In another study, Johnson *et al.* (2015) stated that food allergies could lead to the exacerbation of asthma symptoms, especially in younger patients, and improving the perceptions of these patients toward diet management could diminish the occurrence of these symptoms.^{11, 12}

Although no definitive treatment is available for asthma, proper medical therapies and self-management training (e.g., avoidance of allergens and environmental irritants) could effectively control the severity of this disease.¹³ In this regard, improvement of the quality of care and health outcomes is possible through four key concepts, including evaluation and monitoring, patient education, control of asthma attack triggers, and medical treatment. In general, nourishing lifestyle and health habits play a pivotal role in maintaining health.^{13, 14} As an inherent element in health care, educational programs have been shown to alter the lifestyle of different patients in accordance with their disease.¹⁵

As a chronic disease, asthma affects the lifestyle of the patients, particularly the physical and nutritional aspects. These complications are associated with various limitations for both patients and their families.¹⁶ Therefore, participation of the family members of asthmatic patients in educational programs is of paramount importance in controlling this disease. Implementation of empowerment programs with the purpose of enhancing knowledge, motivation, self-esteem and self-efficacy results in the acquirement of self-control and preventive behaviors, which are essential to the improvement of the quality of life of asthmatic patients.¹⁷

Family-centered empowerment model is an effectual method to empower chronic patients.¹⁸ As the most fundamental social unit, family plays a critical role in the education of individuals to change their behavioral patterns.¹⁵ On the other hand, chronic patients are highly dependent on their family members for proper care, so that families could influence the attitude of patients toward their conditions.¹⁹

Family-centered empowerment model is an Iranian health model developed based on Bandura's social learning theory to improve the health status of chronic patients; this model was designed by Alhani *et al.* in 2002.²⁰ Previous studies have been performed regarding the promotion of lifestyle through the implementation of this model in chronic patients, the results of which have been indicative of the positive effects of this model on the enhancement of various lifestyle dimensions.²¹⁻²³ This model mainly aims to enable the family system to promote the health and wellbeing of chronic patients. The foremost steps in the family-centered empowerment model are the recognition of warning signs, problem solving, educational participation and evaluation.²¹

Patients with asthma must consider notable changes in their lifestyle, especially in terms of nutrition and physical activity.^{8, 10} Optimal management of this disease is possible through controlling environmental factors, cooperation of family members and appropriate medication use.²⁴ This study aimed to evaluate the effects of the family-centered empowerment model on the nutrition and physical activity of patients with asthma.

2. Methods

2.1. Design

This clinical trial was conducted with a control group. Sample population consisted of all the asthmatic patients referring to the subspecialty respiratory clinic of Imam Ali (AS) Hospital in Zabol, Iran in 2015.

2.2. Participants and setting

In this study, Based on the findings of Mahmoudi Rad *et al.* (2013),²¹ sample size of the study ($\mu_2=10.37$, $\mu_1=15.31$, $S_2=3.79$, $S_1=4.07$, $Z_{1-\alpha/2}=1.96$, $Z_{1-\beta}=1.28$, $\alpha=0.05$) was calculated at 13 subjects per each group. Considering the possible sample loss and to increase accuracy, final sample size was determined at 35 subjects per each group. Patients were selected via convenience sampling and assigned to two groups of intervention and control using random number tables.

Inclusion criteria were as follows: 1) definitive diagnosis of asthma by a physician or specialist; 2) age of 18-60 years; 3) experiencing at least one asthma attack within the past six months; 4) absence of diabetes, hypertension, chronic renal failure, cancer, pregnancy and multiple sclerosis; 5) basic literacy of the patient and active family member and 6) no prior employment as a healthcare provider. The only exclusion criterion of the study was the

absence of participants in two consecutive training sessions.

2.3. Instruments

Data were collected using demographic questionnaires, a researcher-made questionnaire on nutrition style, and Beck's standard questionnaire of physical activity.

Demographic characteristics included age, gender, body mass index, location of residence, marital status, occupation status, education level, income status, and number of family members.

In this study, the researcher-made nutrition style scale was designed based on the lifestyle questionnaire by Lali *et al.* (2012)²⁵ under the supervision of the faculty members of Birjand University of Medical Sciences. This questionnaire consisted of 11 items, the validity and reliability of which were confirmed. Items in this questionnaire were scored based on a five-point Likert scale within a range of 11-55. Scores 11-22 represented poor nutrition style, scores 23-44 were interpreted as appropriate nutrition style, and scores 45-55 showed optimal nutrition style. Validity of this tool was confirmed by 10 faculty members at Birjand and Zabol nursing and midwifery schools and three internists at Birjand University of Medical Sciences. Additionally, nutrition style questionnaire was completed by 10 patients without participation in the study, with the reliability estimated at the Cronbach's alpha coefficient of 0.70.

Beck's physical activity questionnaire was designed by Beck *et al.* in 1982²⁶ consisting of 16 items. In accordance with the review of pulmonologists, research objectives and type of disease, 11 items of this scale were used for this study, which were graded based on a five-point Likert scale (score range: 11-55). Scores 11-32 represented inappropriate physical activity, scores 33-44 were interpreted as relatively appropriate physical activity, and scores 45-55 indicated appropriate physical activity. This standard instrument has been widely used in the studies conducted on the Iranian population.^{27, 28} Considering the changes in this scale, its validity was reassessed by 10 faculty members at Birjand University of Medical Sciences (pulmonologists) in order to apply their comments. To determine the reliability of this tool, the questionnaire was completed by 10 patients, and reliability coefficient was determined at the Cronbach's alpha of 0.76.

2.4. Data Collection

Before the intervention, the researcher reviewed the medical records of the patients in order to

identify eligible subjects. Afterwards, interviews were conducted with the patients at the clinic to complete the demographic questionnaire, researcher-made nutrition style scale, and Beck's physical activity questionnaire through self-assessment. After determining the educational needs of patients, necessary changes were applied to the designed training program, so that the empowerment model would be tailored to the needs of the participants.

Educational contents were developed based on reliable sources in terms of asthma, nutrition styles, required actions in asthmatic patients, and needs of the patients.²⁹⁻³¹ For the intervention, the family-centered empowerment model was presented in four steps of recognizing the warning signs, improving self-efficacy through collaborative problem solving, increasing self-esteem through educational participation, and evaluation using process and outcome measurement techniques (Table 1).²⁰

In the intervention group, training was performed based on the family-centered empowerment model in five sessions (maximum 45 min each) for groups of 8-9 participants during 12 weeks at the subspecialty respiratory clinic of the hospital in the morning shift with the presence of the researcher. Subjects in the control group received no intervention.

One week after the intervention, patients were contacted via phone and asked to complete the nutrition style and physical activity questionnaires again in educational sessions at the clinic. Exact dates of the completion of questionnaires were determined at one and three months after the intervention in both groups. Patients in both groups referred to the clinic on specific days in order to complete the questionnaires. After intervention and post-test, patients in the control group received the educational contents in the form of pamphlets.

2.5. Ethical considerations

After the ethical approval of the study protocols and presenting the introduction letter from the School of Nursing and Midwifery of Birjand University of Medical Sciences, procedures were explained to the authorities of the research setting. Participants were assured of confidentiality terms regarding their information and disclosure of research findings. Moreover, informed consent was obtained from all the patients, as well as the family members participating in the intervention group.

2.6. Statistical analysis

Data analysis was performed in SPSS version 16 using descriptive statistics (mean and standard deviation) and Chi-square to determine the

differences in the demographic characteristics of the intervention and control groups. In addition, repeated measures ANOVA was used for the comparison of the mean scores of normal variables (before the intervention, and one week, one month and three months after the intervention).

Comparison of the mean scores of non-normal variables was carried out using the Friedman's test

(before the intervention and one week, one month and three months after the intervention). Moreover, independent t-test was applied to compare the mean differences between the intervention and control groups in terms of normal variables, and Mann-Whitney U test was used for the comparison of mean differences between the intervention and control groups in terms of non-normal variables.

Table 1. Contents of training sessions based on family-centered empowerment model

Steps	Content of sessions
Recognition of warning signs	This step was implemented by the researcher in two 45-min sessions consisting of lectures and group discussions aimed at increasing knowledge and recognition of the warning signs of asthma, followed by noting the nature and implications, intensifying factors and stimulants, important nutritional tips, exercise and effective factors for disease control.
Problem solving	This step was conducted through a group discussion during three 45-min sessions. In this section, patients faced their problem and possible solutions and learned from each other in order to control the complications caused by asthma. After selecting the best solution, healthy nutrition styles, proper physical activity and their relationship with asthma control were presented through lectures.
Educational participation	At the end of each session, to promote self-esteem, patients were asked to transfer the discussed educational topics to their active family members using colorful cards at home. Family members were invited to be enquired about the conveyed knowledge and educational contents.
Evaluation	Process evaluation was performed to assess the model stages before each session through question-and-answer about the raised issues in order to ensure learning in previous sessions.

3. Results

In the intervention group, 18 (51.4%) active family members of asthmatic patients were spouses, nine (25.7%) were their children, and eight cases (22.9%) were their fathers, 25 of whom (71.5%) were above high school diploma. Other demographic characteristics of the participants are presented in Table 2. According to the information in this table, no significant differences were observed in demographic variables between the two groups. In addition, results of Kolmogorov-Smirnov test indicated that before the intervention, all the variables in the control group (except physical activity) had normal distribution.

According to the information in Table 3, mean score of nutrition style in patients of the intervention group significantly improved after the training sessions ($P < 0.001$). Results of Bonferroni post-hoc test suggested that the mean score of nutrition had a significant difference before and one week after the intervention ($P < 0.001$), before and one month after the intervention ($P < 0.001$), and before and three months after the intervention ($P < 0.001$).

On the other hand, mean score of nutrition style in the control group significantly decreased after the intervention ($P < 0.001$). According to Bonferroni post-hoc test, mean score of nutrition style in the control group significantly reduced three months after the intervention compared to before the intervention ($P < 0.001$) and one month after the intervention ($P = 0.039$). After one month, this score

showed a significant increase compared to before ($P < 0.001$) and one week after the intervention ($P < 0.001$), while it decreased after one week compared to before the intervention ($P < 0.001$). After the training sessions, the difference between the intervention and control groups was considered significant in this regard ($P < 0.001$).

According to our findings, mean score of physical activity increased in asthmatic patients after the educational intervention ($P < 0.001$). Results of Bonferroni post-hoc test indicated, mean score of physical activity was significantly higher in the intervention group before and one week after the intervention ($P < 0.001$), before and one month after the intervention ($P < 0.001$), and before and three months after the intervention ($P < 0.001$).

Furthermore, mean score of physical activity in the control group was observed to increase over time ($P < 0.001$). Results of Wilcoxon test showed that this score significantly increased three months after the intervention compared to before and one month after the intervention ($P < 0.001$). Mean score of physical activity significantly decreased one month after the intervention compared to before the intervention ($P < 0.001$), while it had a significant increase one week after the intervention ($P < 0.001$) and one week after the intervention compared to before the intervention ($P < 0.001$). After the intervention, the difference between the study groups was considered significant in this regard ($P < 0.001$) (Table 3).

Table 2. Demographic characteristics of participants

Variable	Group	INTERVENTION	CONTROL	P-value
		N (%)	N (%)	
Gender	Male	9 (25.7)	12 (34.3)	*0.43
	Female	26 (74.3)	23 (65.7)	
Body mass index	Underweight	5 (14.3)	2 (5.7)	*0.44
	Normal	8 (22.9)	6 (17.2)	
	Overweight	14 (40)	20 (57.1)	
	Obese	8 (22.8)	7 (20)	
Location of residence	City	22 (62.9)	14 (40)	*0.06
	Village	13 (37.1)	21 (60)	
Marital status	Divorced	7 (20)	9 (25.7)	*0.57
	Married	28 (80)	26 (74.3)	
Occupation status	Housewife/househusband	18 (51.4)	14 (40)	*0.34
	Employed	17 (48.6)	21 (60)	
Education level	Basic literacy	20 (57.1)	21 (60)	*0.81
	High school diploma and above	15 (42.9)	14 (40)	
Income status	No income	17 (48.6)	14 (40)	*0.62
	Poor	6 (17.1)	5 (14.3)	
	Favorable	12 (34.3)	16 (45.7)	
Number of family members	<3	12 (34.3)	9 (25.7)	*0.70
	4-5	16 (45.7)	17 (48.6)	
	>5	7 (20)	9 (25.7)	
Age (year)	M±SD	34.54±11.06	38.69±28.12	**0.53

*Chi-square; *independent t-test

Table 3. Comparison of mean scores of nutrition style and physical activity in intervention and control groups before intervention and one week, one month and three months after intervention

Variable	Time	Before intervention	After intervention			P-value
		M±SD	One week	One month	Three months	
			M±SD	M±SD	M±SD	
Nutrition style	Intervention	26.74±6.25	44.74±2.76	47.74±1.85	44.59±2.43	*<0.001
	Control	25.09±2.97	23.94±3.03	26.31±3.01	23.69±3.07	*<0.001
	P-value	**0.16	**<0.001	**<0.001	**<0.001	
Physical activity	Intervention	24.06±3.27	31.20±3.06	26.46±3.003	31.20±3.06	*<0.001
	Control	26.49±5.05	27.74±4.80	25.40±4.83	27.34±4.51	***<0.001
	P-value	****0.05	**<0.001	**0.28	**<0.001	

*Repeated measures ANOVA; **independent t-test; ***Friedman's test; ****Mann-Whitney U test

4. Discussion

According to the results of the present study, implementation of the family-centered empowerment model positively influenced the nutrition style and physical activity of the patients with asthma in the intervention group. This is in congruence with the results obtained by Rakhshan et al. (2015), which were suggestive of the significant effect of training based on this model on the nutrition style and physical activity of patients with heart failure.²³ In another research, Vahedian Azimi et al. (2009) investigated the effects of the family-centered empowerment model on the lifestyle of patients with myocardial infarction, reporting that this model caused a significant increase in the mean score of lifestyle in dimensions of nutrition style and physical activity.²² Furthermore, Mahmoudi Rad et al. (2013) proposed that patient education based on the family-centered empowerment model enhanced the nutritional status of patients with hypertension.²¹ On the same note, Bahrami Nejad et al. (2008) claimed that family-oriented lifestyle educational

programs were significantly involved in changing the average consumption of fruits, dairy products and unsaturated fats.³² According to Smith-Mangione et al. (2011), family empowerment could be an effective strategy to enhance the knowledge regarding chronic diseases, reduce unnecessary visits to health centers and increase overall physical activity in children with asthma.³³ Implementation of the family-centered empowerment model is associated with the promotion of family involvement in the adherence of patients to treatment regimens and activity schedules.³⁴ In this regard, Rajabi et al. (2013) stated that application of this model through educational interventions could improve physical symptoms and diminish activity limitations in children with asthma.¹⁶

In another research in this respect, Aggarwal et al. (2010) introduced family as a source of social support, emphasizing on its critical role in improving the adherence of patients to the prescribed dietary regimens after hospitalization.³⁵ Despite the differences in study populations, findings of the aforementioned studies are consistent with the

results of the current research. This congruity could be attributed to the strong relationship between family members and its effects on their health, especially in chronic patients. Considering their close bond, increasing the knowledge of family members regarding chronic diseases could result in active participation in disease prevention and control. Family members are in constant interaction, with their attitudes likely to be influenced by one another, especially in case of chronic patients.¹⁸

Inconsistent with the results of the present study, Arao *et al.* (2007) proposed that family participation in lifestyle training caused no significant changes in the nutrition style of the patients in the intervention group during six months. However, physical activity of these patients was reported to improve after the intervention,³⁶ which is in line with our findings. Differences in the mentioned research could be due to the higher efficacy of the family-centered empowerment model compared to the family-oriented training program since the former is primarily dedicated to the empowerment of patients and their families. With its emphasis on the key role of family members in increasing self-esteem and enhancing motivational, psychological, and functional lifestyle dimensions, the family-centered empowerment model simultaneously improves knowledge, skills, values and beliefs of patients and their families, thereby empowering the family system for health promotion. Inconsistent with our findings, results of another study by Baljani *et al.* (2012) indicated that implementation of a self-management program in the presence of one of the family members of cardiac patients caused no significant difference in the physical activity of the intervention and control groups.³⁷ This discrepancy could be due to the variable type of interventions since in the mentioned study, Baljani *et al.* applied a self-care model principally relying on the role of patients in health promotion, disease prevention and effective disease control. However, in the family-centered empowerment model, health promotion is attained through efficient problem-solving processes adopted by both patients and family members in order to select the best solutions for disease-related issues.

References

1. Kaptein A, Klok T, Moss-Morris R, Brand P. Illness perceptions: impact on self-management and control in asthma. *Allergy clin immunol* 2010; 10(3):194-9.
2. World Health Organization Fact Sheet Fact sheet No 307: Asthma. Retrieved Jan 17, 2013. Available from: <http://www.who.int/mediacentre/factsheets/fs307/en/>
3. Stanojevic S, Moores G, Gershon AS, Bateman ED, Cruz AA, Boulet LP. Global asthma prevalence in adults: Findings from the cross-sectional world health survey. *BMC Public Health* 2012; 19(12): 204-212.
4. Heidarnia MA, Entezari A, Mehrabi Y, Pourpak Z, Moein M. Prevalence of asthma symptom in Iran: a meta-analysis. *Research in Medicine* 2007;31(3): 217-25. [Persian].
5. Jamil H, Raymond D, Fakhouri M, Templin T, Khoury R, Fakhouri H, et al. Self-Reported Asthma in Chaldeans,Arabs,and African Americans: Factors Associated with Asthma. *Journal of Immigrant and Minority Health* 2011; 13(3):568-75.
6. Nazem F. Impact aerobic rehabilitation program on spirometric parameters of body fat middle-aged men with chronic asthma. *Sport physiology* 2012; 15(4): 13-26. [Persian]

One of the limitations of the present study was the differences in the demographic characteristics and psychological conditions of asthmatic patients, which might have influenced the responses to the educational intervention. Moreover, convenience sampling, implementing the intervention in only one health center, and small sample size might have affected the generalizability of the results.

5. Conclusion

According to the results of this study, family-centered empowerment model positively influenced the nutrition style and physical activity of patients with asthma. Since patient training is one of the main responsibilities of nurses, it is recommended that this model be applied to promote patient education, improve the quality of care and increase the ability of chronic patients to meet their needs with the help of family members. Effects of this model should be evaluated in larger sample sizes and referral centers.

Conflicts of interest

The authors declare no conflicts of interest.

Authors' contributions

Gholam Hossein Mahmoudi Rad: research design and final approval of the article. Fatemeh Khaje Mahmoud: study design, research implementation, and preparation of the manuscript. Alireza Nemat: participation in research design and scientific editing of the article.

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7. Chen Y, Tu Y, Huang K, Chen P, Chu D, Leo Lee Y. Pathway from central obesity to childhood asthma. *American journal of respiratory and critical care medicine* 2014; 189 (10): 1194-1203.
8. Yektatabal SH, Ansarfard F. The relationship between mental health and quality of life in patients with asthma. *Iranian Journal of Psychiatric nursing* 2014; 2(1): 72-81. [Persian]
9. Nabavi M, Ghorbani R, Nabavi M, Hoseinzadeh Y. Prevalence of food allergy in asthmatic children under 18 years of age in Semnan-Iran in 2007-2008. *Koomesh*; 11(3):162-8. [Persian]
10. Karimi M, Mirzaeei M, Akhondi R. Food Consumption and Prevalence of Asthma & Allergies Symptoms in Children. *Journal of Shahid Sadoughi University of Medical* 2011; 19(1): 35-44. [Persian]
11. Johnson J, Borres MP, Nordvall L, Lidholm J, Janson C, Alving K, et al. Perceived food hypersensitivity relates to poor asthma control and quality of life in young non-atopic asthmatics. *PloS one* 2015;10(4): e0124675
12. Mirzakhani M, Ghasemi G, Sadeghi M, Ghasemi R. The effects of modified Pilates training on quality of life and clinical symptoms in female asthmatic patients. *Sport rehabilitation*. 2015; 3(5): 43-50. [Persian]
13. Valizadeh L, Bilan N, Zarei S, Sharifi A. Effect of education and controlling Asthma triggers on quality of life among adolescents with asthma: a randomized clinical trial. *Journal of Mazandaran University of Medical Sciences* 2013; 23 (98):49-57. [Persian]
14. Zahran H, Bailey C, Garbe P. Vital signs: Asthma prevalence, disease characteristics, and self-management education-united states, 2001-2009. *Morbidity and Mortality Weekly Report* 2011; 60(17): 547-552.
15. Nasrabadi T, Goodarzi zadeh N, Shahrjerdi A, Hamta A. The effect of education on life style among patients suffering from Ischemic Heart Disease. *Journal of Mazandaran University of Medical Sciences* 2010; 20(79): 72-79. [Persian].
16. Rajabi R, Sabzevari S, Borhani F, Haghdoost AA, Bazargan N. The effect of family-centered Empowerment Model on quality of life school age children with asthma. *Journal of Health Promotion Management* 2013; 2(4): 7-15. [Persian]
17. Paula Sousa P, Antunes A, Carvalho J, Casey A. Parental perspectives on negotiation of their Childs care in hospital. *Nursing Children and Young People* 2013; 25(2): 24-28.
18. Sadeghi M, Pedram Razi SH, Nikbakht Nasrabadi A, Ebrahimi H, Kazemnejad A. Comparison of the impact of education based on the empowerment model and family-center empowerment model on knowledge and metabolic control of patients with type 2 diabetes mellitus. *Journal of Nursing Education* 2013; 2(3): 18-27. [Persian]
19. Bahrami Nejad N, Hanifi N, Mousavinasab SN, Alimohamdi R, Bageri A. Comparison of the impacts of family-based and individual-based interventions on body mass index and lifestyle. *Journal of Zanjan University of Medical Sciences* 2008;16(62): 67-76. [Persian]
20. Alhani F. Design and evaluation of the family-oriented prevention of iron deficiency anemia [dissertation]. Tehran: Tarbiyat Modarres University. 2003. [Persian]
21. Mahmmodi GH, Mohalli F, Alhani F. Effect of familycentered empowerment model on the lifestyle of patients with hypertension. *Medical -Surgical Nursing Journal* 2013; 2(3, 4): 128-136. [Persian]
22. Vahedian Azimi A, Alhani F, Ahmadi F, Kazemnejad A. Effect of family-centered empower-ment model on the life style of myocardial infarction patients. *Iranian Journal of Critical Care Nursing Iran* 2010; 2(4):127-132. [Persian].
23. Rakhshan M, Rahimi Kordshooli Kh, Ghadakpoor S. Effects of Family-Center Empowerment Model on the Lifestyle of Heart Failure Patients: A Randomized Controlled Clinical Trial. *International Journal of Community Based Nursing and Midwifery* 2015; 3(4): 255-262. [Persian]
24. Pedram Razi S, Piroozmand N, Zolfaghari M, Kazemnejad A, Firoozbakhsh S. Education of How-to-Use Peak Flow Meter and Following up via SMS on Asthma Self-Management. *Journal of Haiat* 2012; 18(4): 19-27.
25. Lali M, Abedi A, Kajbaf MB. Construction and Validation of the Lifestyle Questionnaire (LSQ). *Psychological Research* 2012; 15(1): 64-80.
26. Baecke JA, Burema J, Frijters JE. A short questionnaire for the measurement of habitual physical activity in epidemiological studies. *The American journal of clinical nutrition* 1982; 36 (5): 936-42.
27. Pakzamir F, lotfi G, Tahmasebi F. Comparison of mental health among elderly men in athletes, active and passive groups . *Salmand*. 2015; 10 (2) :0-0. [Persian]
28. Azarniveh MS, Tavakoli Khormizi SA. Effect of physical activity on quality of sleep in female students. *J Gorgan Uni Med Sci*. Summer 2016; 18(2): 108-114. [Persian]
29. Brunner LS. Brunner & Suddarth's textbook of medical-surgical nursing. 12th ed, Philadelphia: Lippincott, Williams, & Wilkins; 2010, 244-263.
30. Harrison TR. *Diseases of Respiratory System*. Tehran: Arjomand Publisher; 2008.
31. Lawson J A, Rennie DC, Dosman JA, Cammer A L, Senthilselvan A. Obesity, Diet, and Activity in relation to Asthma and Wheeze among Rural Dwelling Children and Adolescents. *Journal of Obesity* 2013; 1-9.
32. Bahrami Nejad N, Hanifi N, Moosavi Nasab N. Comparing the effect of two family- and individual-based interventions on blood pressure and lifestyle. *The Journal of Qazvin University of Medical Sciences* 2008; 12(1): 62-8. [Persian]
33. Mangione-Smith R, Schiff J, Dougherty D. Identifying children's health care quality measures for Medicaid and CHIP: An evidence-informed, publicly transparent expert process. *Academic Pediatrics*. 2011; 11(3 Suppl): S11-21.
34. Sanaie N, Nejati S, Zolfaghari M, Alhani F, Kazemnejad A. The effects of family-based empowerment on family cooperation in following patient treatment regime after coroner arteries bypass surgery. *Modern Care Journal*. 2014 Jun 15; 11(1): 19-27.
35. Aggarwal B, Liao M, Allegrante JP, Mosca L. Low social support level is associated with non-adherence to diet at 1 year in the Family Intervention Trial for Heart Health (FIT Heart). *J Nutr Educ Behav*. 2010; 42(6):380-8.
36. Arao T, Oida Y, Maruyama C, Mutou T, Sawada S, Matsuzuki H, et al. Impact of lifestyle intervention on physical activity and diet of Japanese workers. *Preventive Medicine* 2007; 45(2-3): 146-52.
37. Baljani E, Rahimi ZH, Heidari SH, Azimpour A. The effect of self management interventions on medication adherence and life style in cardiovascular patients. *Scientific Journal of Hamadan Nursing & Midwifery* 2012; 20(3): 58-68. [Persian]

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