The effect of the training program on the quality of life in patients with asthma based on the Precede model in Ahvaz, Iran

Mina Motaghi Nejad[1], Ghodratollah Shakeri Nejad[1,2], Heshmatollah Tavakol[3], Maria Cheraghi[1,4]

[1]Social Determinant of Health Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
[2]ACECR-Khuzestan, Health Education Research, Jahad Main Branch, Ahvaz, Iran
[3]Air Pollution and Respiratory Diseases Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
[4]Department of Public Health, Health School, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Abstract

Aim: The aim of the study was to determine the effect of the training program based on the Precede model and its main components on improving the quality of life in patients with asthma.

Material and methods: It was a randomized quasi-experimental study done on 120 patients with asthma who were referred to the Imam Khomeini hospital in Ahvaz who were selected using the convenience sampling method and were randomly divided into intervention and control groups. The data collection tool consisted of two questionnaires. The first questionnaire evaluated the quality of life in patients with asthma and the other one was developed by the researcher based on the structures of the Precede model. Training intervention was conducted during four sessions twice a week and each session was carried out for an hour based on the structures of the Precede model. In order to achieve the results, SPSS software, even t-test, and χ^2 were used.

Results: The results showed that after the training intervention in the experimental group, the mean scores of predisposing factors ($p < 0.001$), enabling factors, reinforcing factors and behavioral factors were significantly increased ($p < 0.001$) as compared to the control group. A significant difference was observed in the mean scores of quality of life in two groups after the intervention ($p < 0.001$), and the quality of life of patients in the experimental group was improved after the training intervention.

Conclusions: The design and implementation of the training program based on the Precede model can have a positive effect on the improvement of quality of life in patients with asthma.

Key words: Precede model, asthma, quality of life, Ahvaz.

Introduction

With the control of communicable diseases during the past decades and increased life expectancy, chronic diseases have occurred as a major health problem [1, 2]. Meanwhile, asthma is one of the most common chronic diseases in the world [3]. It has become one of the most serious health problems because of being chronic [4]. Asthma is a chronic inflammatory disease of the airways associated with widespread narrowing of the airways and is characterized by symptoms of coughing, wheezing and asthma attacks. According to the surveys carried out, 5% of the world's population are suffering from asthma and asthma-related deaths accounted for 31% from 1980 to 1987 [5]. The concept of quality of life, which includes satisfaction and well-being, has multi-dimensional and abstract features. Quality of life can be regarded as general quality of a person's life or quality of life related to his/her health [6].

Published reports on the prevalence of asthma in different parts of the world and Iran show the different prevalence of this disease in different parts of the world. The prevalence of asthma is increasing due to urbanization. It is estimated that currently there are 300 million patients with asthma in the world. And it is expected to add 100 million people in the world to the population of asthma patients by 2025 [7]. The results of studies that have been conducted sporadically in the country show that 5% to 7% of the population of Iran suffers from this disease [8]. Most people with asthma have limitations

in their lives and have poorer health conditions than the healthy people [9].

The quality of life involves the differences that are unique to each person and differ from one person to another.

People are increasingly inclined to increase longevity and pay special attention to the positive features of life such as qualities and also consider the quality of life in their lifestyle. Chronic diseases are one of the factors affecting the quality of life and asthma is one of the most common diseases which require long-term therapy due to the long duration of the illness [10]. The improvement of the quality of life in patients and the control of symptoms are important in the treatment of a chronic disease such as asthma [11]. Assessment of quality of life and mental state is one of the dimensions of overall management of asthma [12].

Asthma is influenced by several factors. These factors enhance or suppress the disease and ultimately affect the patient's quality of life. Studies have shown that the quality of life changes in chronic diseases and the study of the quality of life of these patients is important because asthma is a common chronic disease [13]. The purpose of the control and treatment of all chronic diseases such as asthma is helping the patient to achieve a desired quality of life.

According to the asthma management guidelines, patient training is essential in the treatment of adults with asthma [14]. One of the factors that can affect the quality of life of asthma patients is the lack of knowledge of this group of patients about their disease [4]. Appropriate training programs about the disease and methods of treatment and also the items that should be followed by the patient can improve the patient's performance and reduce the limitation of roles [1].

In a study conducted in 2011, it was concluded that the role of training should be considered to improve the quality of life in patients with asthma [4].

In a study conducted in the Zanjan city, it was concluded that not only training, but also the type of training plays an important role in improving the quality of life and changing it [15]. In a study conducted in 2003, it was found that after the training intervention, members of the experimental group had a better knowledge and better quality of life than the control group [16]. In a study conducted in 2003, it was reported that promoting the knowledge and awareness of patients with asthma about their disease can improve the quality of life for these patients [17].

Considering that in the therapeutic management of chronic diseases, training programs are very important for patients and their caregivers and the selection of a health education model is the first step in the planning process. Thus, in this study, the Precede model was used as a strong theoretical model for the development, implementation and evaluation of the training intervention program to increase the awareness and improve the attitude of patients towards their disease and strengthen

their accountability and independence to manage the disease and limit its complications [18].

The Precede model is a process for changing behavior and reviews the possible outcomes of a training program [19]. The PRECEDE-PROCEED model is a planning model which makes it possible to identify and implement many of appropriate intervention strategies. This model has the potential to be used in public health, schools, society and health promotion, and prevention of disorders [20]. Based on this model, predisposing, enabling, and reinforcing factors affect behavior and quality of life [6].

One of the most important features of the Precede model in health education is providing a comprehensive view of the subject that considers the patient's behavior in three important areas. The first area is the predisposing factors which deals with the factors that are needed to create the motivation for adopting the behavior. Knowledge, beliefs, attitudes, values and customs are all predisposing factors for creating the behavior. The second area involves the reinforcing factors which include receiving the reinforcement as a feedback after the adoption of behavior. These factors include social support, influence of peers, parents, and friends, which increases the likelihood of continuation of recommended behavior. The third area involves the enabling factors which include the provision of facilities and services and creation of skills to change the behavior [21].

The Precede model goes through the successive and continuous steps in the design, implementation and evaluation process by which the intervention will help in achieving the objectives of the training program [22].

Aim

The purpose of this study is to determine the effect of training based on the Precede-Proceed model on knowledge, attitude and the creation of desired behavior in order to improve the quality of life in patients with asthma.

Material and methods

The present study is an interventional quasi-experimental research in which the effect of training on the quality of life for asthma patients referred to the Lung Department of the Imam Khomeini Hospital in Ahvaz in 2014 will be discussed. Research samples in this study were 120 patients with asthma who were referred to the Lung Department of the Imam Khomeini Hospital in Ahvaz and were selected by a convenience sampling method if the inclusion criteria were fulfilled.

Inclusion criteria: patients (men and women) with asthma who were referred to the hospital with a definitive diagnosis by the doctor, over 20 years of age, the ability to communicate and the lack of previous participation in training programs in relation to asthma, at least 6 months' experience of asthma, having the minimum

Table 1. Educational content of the intervention program for the experimental group

Session	Educational content
1	Familiarity with asthma and lung function and disease risk factors, complications and outcome of the disease (predisposing factors) and familiarity with life skills and using these skills to improve the quality of life (enabling factors), familiarity with patients who have a similar problem (reinforcing factors)
2	Familiarity with respiratory and aerobic exercises and their role in improving the health of body and mind and using these skills for self-care and disease control (predisposing and enabling factors)
3	Familiarity with relaxation techniques and stress management in the event of attacks and skills in the daily schedule (predisposing and enabling factors)
4	Summary of meetings held for patients and giving pamphlets to patients (predisposing and enabling factors), identifying the problems of patients in changing the trained behaviors as group discussion (predisposing factors, reinforcing factors)

ability to read and write, willingness to participate in the study, no experience with other underlying diseases.

Exclusion criteria: patient's participation in training classes for less than two sessions, changing the address of the patient and the lack of access to the patient, unwillingness to continue participating in the study.

Study design

The researchers referred to the specialized department of the Imam Khomeini Hospital in Ahvaz and divided the available patients with asthma into two groups of cases and controls Thus, the patients with even numbers were put in the intervention group and the patients with odd numbers were put in the control group. The sample size was determined as 60 patients in the intervention group and 60 patients in the control group. The data collection instrument consisted of two questionnaires and the first questionnaire included two parts. The first part determined the demographic characteristics and the second part determined the quality of life in the dimensions of physical health, symptoms, social performance,
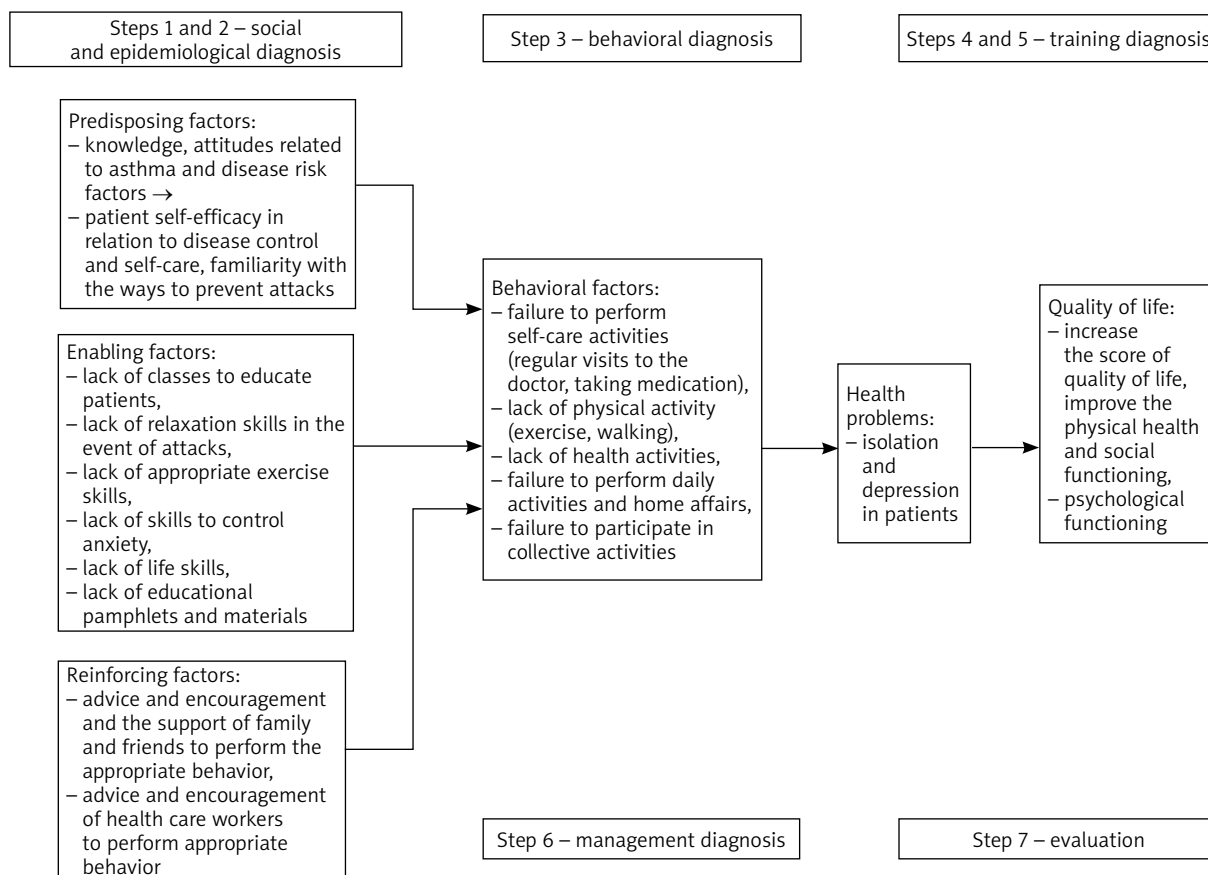

Figure 1. Application of the PRECEDE model on the quality of life in patients with asthma

economic status and mental performance. This questionnaire was designed using several standard questionnaires of quality of life in asthma disease (Wisconsin QOL questionnaire, George QOL questionnaire, Milton QOL questionnaire, Pickel life events log, Jeniper SF-36 QOL questionnaire). Cronbach's α coefficient was used to determine the reliability of the questionnaire and its coefficient in all aspects of the quality of life was 86%. The scientific validity of the questionnaire was confirmed by content validity. Using this tool, the quality of life of patients was evaluated in five dimensions, the mean score of the quality of life was calculated and the patients that had the quality of life below the average level were put in the group of undesired quality of life and the patients that had the quality of life above the average level were put in the group of desired quality of life. The second questionnaire made by the researchers was entitled "Precede questionnaire" and included the questions about healthy lifestyle and behaviors based on the structures of the Precede educational model. Structures included the predisposing factors (awareness 15 questions, attitude 10 questions and self-efficacy 7 questions), enabling factors (available resources and training classes, skills, 7 questions), reinforcing factors (3 questions) and behavioral factors (8 questions). Content and face validity of the questionnaire was approved by a panel of experts and Cronbach's α was used for the internal correlation of structures. Test – retest was used for the reliability of the questionnaire within 2 weeks. The initial questionnaire was completed for both groups. And after the analysis of the initial test, the theory-based training program was designed and implemented in four sessions for 2 weeks and each session for 1 h through lecture, questions and answers, and using the printed texts for the experimental group (Table 1). Participants discussed the experiences of their life in relation to asthma. In this study, two types of training (direct and indirect) were used. For the team support, the experimental group was divided into 4 training groups and each session was held for 60 min. Training programs were designed based on the educational model of Precede which is a diagnostic approach in health education programs and has 7 steps (Figure 1).

Direct training was carried out through group discussion, face-to-face training and indirect training via educational pamphlets. In this study, we tried to use the tools like whiteboard, booklets and pamphlets for more effectiveness of training. According to the behavioral subjects and goals, different ways of training were selected and thus the training sessions were designed as lectures, group discussions and questions and answers. (In this survey, the question and answer method was used to help the patients better understand the content and not having the one-way educational process).

Educational resources (pamphlets, training programs, training classes, training photos about deep breathing and etc.) and trained skills (including the skills of relax-

ation and proper breathing exercises, forming a support system of asthma patients who attended the meeting, the skills of individual health and life skills, stress management skills in the attacks) were considered as enabling factors.

Two months after the training intervention, questionnaires were distributed and completed again. In order to achieve the results, SPSS software, Pair t-test, independent T-test, and χ^2 test were used.

Sample size

One hundred and twenty patients participated in this study and were randomly divided into two groups: experimental and control groups. By using the formula

$$ n = \frac{(z_{1-a} - z_{1-b})^2 \ (s_1^2 + s_2^2)}{(\mu_1 - \mu_2)^2} $$

and considering $\alpha = 0.05$ and $\beta = 0.02$, 60 patients were calculated for each group.

Ethics

– Providing a written recommendation letter from the university to the hospital and getting approvals of authorities.
– Getting the approvals of participants.
– Assuring the patients about the confidentiality of their information.

Results

In this study, 120 patients with asthma that were randomly put in case and control groups ($n = 60$ per group) were included in the study. In each experimental group, 56% were males and 44% were females and in the control group 55% were males and 45% were females. The mean and standard deviation of age in the experimental group were 37.66 ±12.82 and in the control group were 38.46 ±10.54 years. The education level of most study patients was secondary and high school (48.3%) and most of them were married (82.5%). Most of the patients were covered by insurance (86.7%) and lived with their spouse and children (61.7 %). The highest percentage of patients were employed (59.2%), the minimum duration of disease was months and the maximum duration was 420 months and also the highest rate of disease was in the range of 6–60 months (50.8%).

The mean score of patients' awareness in both groups before the training intervention had no significant difference ($p < 0.55$), but 2 months after the training intervention, the mean score of awareness in the case group was significantly higher than in the control group ($p = 0.001$). Independent t-test showed that the mean scores of patients' attitude in both groups before the training intervention had no significant difference ($p <$

Table 2. Comparing the mean scores of awareness, attitude, self-efficacy, reinforcing factors, enabling factors, behavior before and after the training intervention

Variables	Before the intervention					After the intervention				
	Experimental group		Control group			Experimental group		Control group		
	Mean	SD	Mean	SD	*P*-value	Mean	SD	Mean	SD	*P*-value
Awareness	7.4	2.9	6.9	2.6	0.55	11.63	2	6.4	1.2	0.001
Attitude	27.2	8.9	28.9	10.4	0.89	31.3	5	20	9.2	0.001
Self-efficacy	17.4	2.9	18.5	8	0.74	17.96	2.8	15	5.3	0.001
Reinforcing factors	8.9	4	8.8	3.8	0.88	10.9	1.41	6.8	2.6	0.001
Enabling factors	20.26	9.25	20.51	9.6	0.82	23.13	2	15.56	6.25	0.001
Behavior	28	3.1	27.9	3.81	0.95	30.3	3	28.28	6.9	0.001

Table 3. Comparing the average of the dimensions of quality of life before and after training between the experimental and control groups

Variables	Before the intervention					After the intervention				
	Experimental group		Control group			Experimental group		Control group		
	Mean	SD	Mean	SD	*P*-value	Mean	SD	Mean	SD	*P*-value
Physical health	10.3	2.4	10.31	2.7	0.17	14.1	2.12	11	3.1	0.001
Symptoms	16.2	4.5	16.16	6.4	0.56	21.7	4	16.81	7.2	0.001
Social performance	16.4	2.8	16.6	4.84	0.23	17.61	2	15.56	3.2	0.001
Economic status	9.9	2.9	9.7	3	0.33	10.25	3.1	10.13	3.2	0.42
Mental performance	22.2	4.5	21.5	4.8	0.93	23.58	4.7	22.25	9.3	0.019
Quality of life	75.86	12.16	73.35	14.12	0.93	83.35	12.32	76.35	16.91	0.011

0.89), but 2 months after the training intervention the mean score of attitude in the case group was significantly higher than in the control group ($p < 0.001$).

Also, independent t-test showed that the mean scores of patients' self-efficacy in both groups before the training intervention had no significant difference ($p < 0.74$), but 2 months after the training intervention, the mean score of self-efficacy in the case group was significantly higher than in the control group ($p < 0.001$). Independent t-test showed that the mean scores of patients' behavior in both groups before the training intervention had no significant difference ($p < 0.95$), but 2 months after the training intervention, the mean score of behavior in the case group was significantly higher than in the control group ($p < 0.001$). The mean scores of reinforcing factors in both groups before the training intervention had no significant difference ($p < 0.88$), but 2 months after the training intervention, the mean score of reinforcing factors in the case group was significantly higher than in the control group ($p < 0.001$). The mean scores of enabling factors in both groups before the training intervention had no significant difference ($p < 0.82$), but 2 months after the training intervention, the mean score

of enabling factors in the case group was significantly higher than in the control group ($p < 0.001$) (Table 2).

The mean scores of quality of life in both groups before the training intervention had no significant difference ($p < 0.93$), but 2 months after the training intervention, the mean score of quality of life in the case group was significantly higher than in the control group ($p < 0.011$).

There was no significant difference between the two groups of experimental and control in terms of the different dimensions of quality of life but after the training intervention there was a significant difference between the two groups in terms of all dimensions except the economic status (Table 3).

Discussion

Focus on changing a behavior related to a health problem and extensive evaluation of the factors related to this behavior could be helpful in reduction of human diseases and associated economic factors [23]. The PRECEDE-PROCEED model can be used as a planning model for the design and development of health promotion programs [6, 23–25]. In fact, PRECEDE-PROCEED

is the best model for describing the factors affecting health outcomes, providing a comprehensive structure for health needs assessment, design, execution, and evaluation of health promotion programs, and studying behaviors [26]. This model assumes that a training diagnosis should be done before an intervention as a medical diagnosis takes place before treatment [24]. This model is a useful way to organize research and provides a framework for planning and execution of health education programs in the areas of priority [23, 24]. Predisposing factors before enabling factors and enabling factors before reinforcing factors should be changed and modified. Knowledge alone does not make a behavioral change [23]. In a study conducted by Nadrian *et al.* [23, 24], no significant relationship was found between knowledge of the disease and self-care behaviors, and despite having knowledge about their disease; patients did not do these behaviors.

In the phase of predisposing factors, knowledge and awareness, beliefs, values, attitudes, priorities, skills, and self-confidence are factors that modify the behaviors of a person and motivate him/her [24, 27]. Reinforcing factors are those that facilitate repetition and consolidation of behavior and include social support, peers group, family, influential individuals, employers, teachers, health professionals, leaders and decision-makers, and respected individuals [28]. In fact, these factors are rewards or reinforcements for behavior change [27].

Enabling factors pave the way for behavior change or environmental changes. These factors, which include psychological, emotional, and physical factors, directly or indirectly affect behavior through environmental factors, laws and regulations, health plans and the availability of services, available resources, and skills. These factors finally lead to creation of incentives for behavioral change facilitation [24].

According to the study results, it is observed that the experimental group obtained higher scores than the control group in terms of the predisposing factors, which is consistent with the study results of Moghaddamniasar *et al.* [5], Chiang *et al.* [29], and Salehi and Haidari [30]. In a study conducted by Mazloomy *et al.* on the quality of life of the elderly using the Precede model, the mean score of predisposing factors showed an increase after the training intervention [6].

Training increases the awareness and performance of patients and also saves time, energy and encourages the patients to take care of themselves and prevent readmission [31].

It seems that the patient should have good awareness about these behaviors in order to have appropriate behaviors to take care of him/her. Increased awareness is an incentive to respect the principles of self-care [32]. Increased knowledge and awareness about the disease reduces the social anxiety and increases the self-esteem in patients [18]. The findings of a recent study showed that the mean score of patients' attitudes in the experimental group was significantly increased than the control group after the training intervention. Perhaps this situation can be attributed to the use of various training methods and communicate and interact more effectively with people and explain the concepts of quality of life within the framework of training intervention designed on the basis of Precede model. These changes can indicate the effectiveness of training program to improve the quality of life of patients. The results of this study are consistent with the results of Jalili [22], Afkari [33], and Sabzmakan [34]. Positive attitude of people to have a normal life with the proper control of the disease increases significantly after training [28]. The positive attitude of the patient to have a normal life is associated with the good control of the disease [18]. The findings of a recent study indicate that the mean score of self-efficacy in the experimental group before and after training had no significant change but the mean score of self-efficacy in the control group decreased compared to that before the training. These changes can indicate the effectiveness of training programs on patients' self-efficacy to improve the quality of their lives. Given that the self-efficacy score in the control group decreased 2 months after the training intervention, the training program conducted was effective for the self-efficacy of patients and prevented the decline in the mean score of self-efficacy in the intervention group. The study results suggested that the training interventions can improve the awareness and knowledge of patients on the quality of life but the significant increase was not found in the self-efficacy score. The reasons of these outcomes can be due to the nature of the study subject, the need to use existing structures in the learning theory, the used educational methods and the related conditions. Lack of social support in patients reduces the perceived control of patients and their self-efficacy, which leads to a reduction in the quality of life of patients. On the contrary, the provision of social support in patients increases their motivation, sense of value and self-efficacy, which leads to favorable and stable lifestyle changes in patients in the long run. Smaeli *et al.* in their paper pointed out that self-efficacy as a factor affecting the quality of life focuses on the skills and abilities of the patient in the successful implementation of a worthy performance. Self-efficacy can affect all aspects of life; a sense of self-efficacy can be a critical factor in the success and failure throughout life [35].

The results show that after the training intervention, the experimental group gained higher scores in terms of enabling factors (resources and skills) than the control group. The results of this study are consistent with the results of Khani Jyhouni [20], Mohammad [26], and Amiri [36]. Enabling factors are considered as a facilitator in the process of recognition [37]. After the training intervention there was a more significant difference in terms of en-

abling factors in the case group than in the control group. The mean score of enabling factors in the control group significantly decreased after the training intervention. The significant decrease in the mean score of enabling factors in the control group after the training intervention can be due to the lack of health resources related to asthma in the community as well as the reluctance of patients to receive educational and health services.

After the training intervention, the experimental group gained more scores than the control group in terms of reinforcing factors. In this study, the encouragement of friends, family and health care providers was considered as reinforcing factors. Reinforcing factors include receiving the reinforcement as a feedback after the adoption of behavior. These factors include: social protection, the influence of peers, parents and caregivers, which increases the likelihood of the continuation for the recommended behavior. The results of this study are consistent with the results of Shakoori [38]. Reinforcement of desired behavior is an important part of a social cognitive theory, which leads to the establishment of a sustainable behavior and repetition of that behavior [24]. Mirtz *et al.* suggest that the presence of supportive resources in disease conditions affects the improvement and consistency of the quality of life.

The findings of a recent study showed that the mean score of patients' behavioral factors in the experimental group has increased more significantly than in the control group after the intervention. The results of this study are consistent with the results of Sabzmakan [34], Saheb Al-Zaman [28] and Shakoori [38]. Correction of predisposing, enabling, and reinforcing factors probably leads to a behavior change. In a study conducted by Binkley *et al.*, it was shown that training based on the PRECEDE model can be effective in this regard [24]. Significant behavioral changes can be brought in patients through creating motivation. An important goal in training is the creation of appropriate and lasting health behaviors. Findings and results of the training intervention based on the Precede theory on the quality of life of patients with asthma showed that this model had a desired effect on the variables which are the structures of the mentioned model. It can be used as a template-based intervention to improve the quality of life of asthma patients and similar subjects. It is very clear that training in any field can improve knowledge and thus brings positive changes but the important thing is that training the patient in the study made significant positive changes in the average quality of life of patients. The disturbing question that arises here is that if the patients in our country need to be trained so that large changes can be created over a short period of training. Or whether in our health system, less attention was paid to the issue of training that can cause positive changes in the quality of life of asthma patients.

The researchers suggest that different studies examine the impact of different educational models in relation to asthma patients in order to promote the quality of life of these patients by choosing an effective training model that fits with the culture of the community.

One of the limitations of this study is the limited time for the implementation of training programs, thus long-term effects of the training program have not been studied. The future studies should be designed to track the long-term effects of this training model in order to obtain relevant information in this regard.

Acknowledgments

Conflict of interest

The authors declare no conflict of interest.

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