



# The effect of educational intervention on self-care learning in patients with asthma; the results of a randomized clinical trial

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## Abstract

**Introduction:** Asthma is one of the prevalent and costly diseases. Various studies have shown that self-care plays a major role in preventing the complications, improving the life quality, and reducing the care expenditures of asthma. Therefore, strengthening the asthma patients in caring for themselves and using planned trainings is highly necessary.

**Objectives:** The present study aimed to investigate the effect of education on self-care learning in the patients suffering from asthma.

**Patients and Methods:** The present interventional study was conducted on 80 patients referring to specialized clinics of Shiraz University of Medical Sciences who had the inclusion criteria of the study. The patients were selected through convenient sampling and randomly assigned to either the control or the intervention group. The educational intervention included five sessions of training on self-care. The study data were collected using a demographic questionnaire as well as a knowledge assessment test and the results were analyzed through the SPSS statistical software.

**Results:** The study results revealed no significant difference between the two groups regarding the demographic variables. However, comparison of the mean of changes in the two groups' knowledge scores showed a significant increase in the intervention group's knowledge score ( $P < 0.001$ ).

**Conclusion:** The findings of this study confirmed the patients' need for learning self-care methods as well as the effectiveness of planned educational programs. Therefore, using and strengthening self-care trainings are highly recommended for asthma patients in clinics.

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## Introduction

Asthma is one of the most prevalent chronic diseases around the world (1). Moreover, due to the increase in its prevalence, severity, and effects on various individual, familial, economic, and health system dimensions, the epidemiology of asthma diseases is of utmost importance (2,3). Asthma expenditures are quite considerable both regarding direct medical costs, such as inpatient services and medication costs, and indirect medical costs, including being absent from work and early death (4,5). Additionally, asthma-related mortality is increasing all around the world (4).

In general, educating the patients is a successful treatment method which results in health maintenance and improvement in

## Key point

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the society and is accompanied by a great number of advantages (6,7). Educating the patients also leads to an increase in patient satisfaction, improvement in the quality of life, assurance about care continuation, sedation of anxiety, reduction in the incidence of disease, increase in taking part in healthcare programs, and the patients' gaining autonomy in doing their daily activities. Moreover, training the patients develops health and treatment objectives,

improves health care, reduces the expenditures, decreases the medication needs, reduces the length of hospital stay, and reduces dangerous behaviors as well as the risk factors and, consequently, decreases the mortality (6). Therefore, strengthening the patients on self-care using planned trainings based on client-oriented approaches, including active cooperation of the patients, are quite necessary (3). Partridge et al conducted a study in 2008 and stated that without training the patients and involving them in self-care, performing health care will be more costly and the quality of life will be accompanied by more deficiencies (7).

Furthermore, Vickery et al studied the effect of self-care on the diseases' subsequences and showed that training the patients regarding self-care can reduce the proportion of medical visits, malignancies, and the expenditures (6). Moreover, Castro et al investigated the effect of the specialist nurse intervention on the asthma patients with the background of repeated use of healthcare services. The results revealed a lower proportion of further hospitalizations due to asthma in the intervention group compared to the control group ( $P=0.04$ ). A significant decrease was also observed in the interventions group's days off from work or school and healthcare expenditures. Therefore, follow up after asthma-related hospitalization and the nurses' or asthma specialists' referring to the emergency department can reduce further attacks and also improve other asthma subsequences (8).

Self-care refers to a method by which an individual tries to prevent diseases as well as disabilities. It is also one of the major concepts which emphasize positive healthy behaviors (9). Self-care consists of activities, such as improving health, preventing the diseases, treating the diseases and injuries, and treating the chronic diseases (10). Training the patients is one of the main roles of the nurses and is considered as an autonomous function as well as one of the standards of nursing care (11). Based on the principles of effective education, designing the training programs and strengthening the trainees should be carried out according to the needs, individual differences, and background conditions (12).

## Objectives

It is necessary to identify and assess the educational programs based on the addressees' characteristics and using scientific research methods. Therefore, the present study aims to investigate the effect of educational intervention on self-care in the patients suffering from asthma.

## Patients and Methods

### Study population

The present interventional study including pre-test and post-test aimed to investigate the effect of self-care educational program (independent variable) on the knowledge of asthma patients (dependent variable). According to the statistical advisor, using the information in similar studies, and considering the power of 80%, confidence coefficient of 95%, and 25% probability of

loss, a sample size of 40 subjects was determined for each study group. During three months and a half, a total of 80 patients referring to the specialized clinics of Shiraz University of Medical Sciences, Shiraz, Iran who had the inclusion criteria of the study were selected through convenient sampling and randomly assigned to either the control or the intervention group.

The inclusion criteria of the study were a specialists' confirmation of the patients' asthma, passage of at least one year from diagnosis of their disease, being between 19 and 64 years old, not having taken part in educational programs in other centers during the past 6 months, not simultaneously participating in other similar educational programs, having the ability to read, write, and understand Persian, not suffering from other known chronic diseases, such as diabetes and cancer which need special care programs, and completing the written informed consents for taking part in the study. On the other hand, the exclusion criteria of the study were being absent from educational classes for two or more sessions, not taking part in either the pre-test or the post-test, not being interested in continuing their cooperation in the study, being diagnosed with other chronic diseases which require hospitalization as well as specific treatments, and moving away from the research environment due to migration, death, etc. After all, 61 subjects (30 in the control and 31 in the intervention group) were enrolled into the study.

The study data were collected through two instruments. The first one was a demographic questionnaire which was prepared by the researcher according to the experts' opinions. This questionnaire included the demographic characteristics, such as age, gender, occupation, level of education, marital status, smoking, and length of disease diagnosis. The second instrument of the study was the knowledge assessment test which consisted of 30 multiple choice questions. In this test, scores of 1 and 0 were given to the correct and incorrect answers, respectively. It should be noted that both data collection instruments were self-completed (13-18).

### Reliability and validity of knowledge assessment test

The validity of the knowledge assessment test was confirmed through content analysis. In doing so, first, the primary test was developed by referring to reliable scientific resources and using the professors' opinions. It should be noted that the resources 13 to 18 were also used in preparing this test. Then, it was reviewed by 8 faculty members of Shiraz University of Medical Sciences, Shiraz, Iran and after implementing their comments, the final version of the test was approved by the professors.

Moreover, the reliability of the test was confirmed using the test-retest method. At first, the test was given to 21 individuals with the same characteristics as the research subjects. After 2 weeks, those individuals took part in the same test and its reliability was confirmed through the correlation statistical test ( $r = 0.97$ ).

In this study, both groups completed the demographic questionnaire as well as the knowledge assessment test as

the pre-test. Then, the intervention group was involved in five 60-minute educational sessions emphasizing self-care in asthma through interactive lectures, practical shows, question and answer, face-to-face training, and presenting educational pamphlets. After 2 months, both groups took part in the post-test.

### Ethical Issues

The research followed the tenets of the Declaration of Helsinki. The study was approved by the research committee of Shiraz University of Medical Sciences. Before the study, written informed consent was obtained from all patients who participated in the study. All information about individuals was coded and kept confidential (identifier: IRCT201104236261N1; <http://www.irct.ir/trial/6696>).

### Statistical analysis

The study variables were both quantitative and qualitative and the data were analyzed through descriptive (frequency of the samples' information) as well as inferential statistics (analysis of the study results). In this study, the data were entered into the SPSS statistical software and analyzed using independent sample *t* test, chi-square, Fisher's exact test and Mann-Whitney U test. A *P* value less than 0.05 was considered significant.

### Results

The study results revealed no significant difference between the two study groups regarding gender, marital status, levels of education, length of disease diagnosis, and smoking which shows the accurate random allocation of the subjects to the study groups and that the results can be more certainly accepted. It should be mentioned that none of the participants smoked in this study.

The subjects' age ranged from 20 to 63 years old and their mean age was  $42.81 \pm 12.29$  years. In addition, the mean age of the intervention and the control group subjects was  $40.41 \pm 12.84$  and  $45.30 \pm 11.37$  years, respectively; of course, the difference was not statistically significant. In this study, most of the participants of both study groups were female (76.7% in the control and 54.8% in the intervention group) and married (93.3% in the control and 77.4% in the intervention group). Moreover, most of the subjects of the control group had below diploma degrees (50%), while most of the intervention group subjects had diplomas (51.6%). Besides, the majority of the participants of both groups were homemakers (46.7% in the control and 35.5% in the intervention group). Finally, 2-5 years and more than 10 years had passed from the disease

diagnosis of the majority of the control patients (33.3% for each), while more than 10 years had passed from most of the intervention group subjects' disease diagnosis (32.3%). Table 1 shows the effect of self-care training on the knowledge scores. According to the results of Mann-Whitney U test, the mean score of knowledge has significantly increased in the intervention group ( $P < 0.001$ ), which shows that training the asthma patients on self-care has led to an increase in the knowledge about the disease.

### Discussion

The results of the present study showed that conducting the self-care educational program in a 2-month follow-up period increased the asthma patients' knowledge of self-care. This is consistent with the findings of the study by Meszaros et al which revealed education to increase the asthma patients' level of knowledge (19). In the same line, the study by Yang et al showed that education on asthma could significantly improve the adult asthma patients' knowledge as well as life quality (20). Wang et al also investigated the effect of asthma educational program on asthma general knowledge as well as asthma-related quality of life in Taiwanese patients suffering from asthma in a 6-month follow-up period. In that study, asthma knowledge scores were obtained using the Chinese version of asthma general knowledge questionnaire for adults whose reliability and validity had been confirmed. The results of the study showed that asthma general knowledge had increased in both study groups 1, 3, and 6 months after the intervention; of course, the increase was significantly higher in the intervention group compared to the control group ( $P < 0.001$ ) (21).

Recently, a new group-based program on training adult asthma patients on self-care has been developed in Ohio which includes several weeks of long-term training sessions. The study results showed that asthma self-care educational programs for adults led to a considerable improvement in knowledge, life quality, and behavioral changes in asthma (22). Cote et al also conducted a study on the effect of asthma education on the severity of asthma, quality of life, and environment control in 2000. In that study, all the important issues related to asthma were covered in the educational program and the results showed that taking part in an asthma educational program based on self-management increased the patients' asthma knowledge (23).

### Conclusion

No significant difference between the two groups regarding the demographic characteristics shows the appropriate

**Table 1.** Mean and SD of the two groups' knowledge test scores and their changes before and after the intervention

Group	Index					
	Before the intervention		After the intervention		Change	
	Mean	SD	Mean	SD	Mean	SD
Control (n= 30)	15.10	5.28	16.70	5.11	1.60	2.17
Intervention (n= 31)	16.32	4.04	26.03	4.01	9.70	3.97

random allocation of the subjects to the study groups and that the study results can be more certainly generalized to the research community. Furthermore, the findings of this study confirmed the patients' need for learning self-care methods as well as the effectiveness of planned educational programs. Therefore, using and strengthening self-care trainings are highly recommended for asthma patients in clinics.

### Limitations of the study

The present study was faced with several executive limitations and challenges. Although the clinics of Shiraz University of Medical Sciences, Shiraz, Iran have the greatest rate of referrals, concentration on face-to-face education was one of the limitations of the current study. In addition, limited physical space of the clinics, timing for the referents, and gathering them in one group were the challenges encountered in this study which were eliminated to a great extent. Finally, considering the criteria for selecting the sample size of the study, the results should be generalized to the research community with caution. Of course, it should be noted that, in spite of the executive limitations and challenges, the present study confirms the patients' need for learning self-care methods and recommends implementation and empowerment of patient training in the educational interventions.

### Suggestions for further research

1. The effect of self-care training on disease control rate in asthma patients
2. The effect of self-care training on pulmonary function tests in asthma patients
3. The effect of self-care training on hospitalization and emergency department referral rates in asthma patients

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### Authors' contribution

MHK, AH and MAGH contributed to study design, preparation of manuscript and final revision. HRT, FD and AH participated in data gathering. MM conducted data analysis and interpretation. All authors read and approved the paper.

### Conflicts of interest

The authors declare no conflict of interest.

### Ethical considerations

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

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