

Promoting Health Literacy and Perceived Self-Efficacy in People with Chronic Obstructive Pulmonary Disease

Abstract

Background: Chronic Obstructive Pulmonary Disease (COPD) is an irreversible condition and it is of great importance for the patients to practice self-care. Given the impact of inadequate health literacy on people's self-efficacy in a self-care program, the aim of this study was to improve health literacy and self-efficacy in people with COPD. **Materials and Methods:** The present quasi-experimental study was conducted on 70 patients with COPD admitted to Shahrekord educational hospitals in 2019. Using random allocation software, the samples were randomly divided into intervention and control groups. Data collection tools included three questionnaires including demographic, health literacy, and perceived self-efficacy questionnaires. A training program, with three weekly sessions of theoretical and practical trainings, was conducted for the intervention group in classes in the hospital. The time of each session was 40 min. Data were collected three times i.e., before, immediately after, and three months after the trainings. Data were analyzed by means of SPSS 21 statistical software using descriptive and inferential statistics. **Results:** Before the intervention, the mean scores of perceived self-efficacy and health literacy did not differ significantly between the two groups, but after the intervention, the scores of the members in the intervention group increased significantly ($f = 62.15, p < 0.05$). **Conclusions:** The results of the study indicated an increase in the scores of perceived self-efficacy and health literacy in people with COPD. The use of targeted educational interventions can have a positive effect on the treatment and control of the disease.

Keywords: Chronic obstructive pulmonary disease, health literacy, self efficacy

Introduction

Chronic Obstructive Pulmonary Disease (COPD) is an irreversible condition restraining airflow in the airways, and its main symptoms are shortness of breath, cough, and excessive sputum.^[1] The disease is a genetic disorder intensified under the influence of environmental factors, which leads to respiratory failure if not treated.^[2] COPD is the fourth leading cause of mortality in the world, and according to the World Health Organization, it will become the third cause of death by 2030.^[3] The total cost of treatment allocated by the United States (US) healthcare system to patients with COPD was about \$29.5 billion,^[4,5] while in Europe in 2020, the estimated cost of treating patients with COPD was about €38.6 billion and its indirect costs was \$20.4 billion.^[6,7] On the other hand, according to the statistical data collected in Iran in 2008, out of 70 million people, 7 million in the country

were suffering from respiratory diseases, which indicated a prevalence of 10% among the Iranian population.^[8] The above-mentioned statistical data indicate a significant increase in the rate of mortality from respiratory disease during the last 10 years, thus the effective control of fatality would require a combination of education and treatment strategies including environmental health plans and increasing the level of people knowledge about this disease.^[9] Health literacy is a factor that has a great impact on knowledge and awareness of patients.^[10] COPD is considered as a preventable disease, hence promoting health literacy in these patients can reduce their exposure to major risk factors and can prevent a large number of new cases as well.^[11] The Center for Disease Control and Prevention defines health literacy as an individual capacity to obtain, communicate, process, and understand basic health information and services

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to make appropriate health decisions.^[12] Health literacy represents an individual's aptitude to acquire, understand, and process health-related information required for making health decisions.^[13]

Only half of the adults, especially the sensitive and vulnerable groups, have an adequate and satisfactory level of health literacy.^[14] Inadequate health literacy has significant negative effects on patients' behavior, resulting in adverse outcomes and consequences, including poorer health status, increased hospitalization, and increased rate of mortality that may become twice as much as that occurring in other groups of people.^[15] Given the significant burden of chronic diseases, promoting the people's level of health literacy can play a decisive role in the prevention and treatment of these diseases and saving resources.^[16,17]

A low level of health literacy is more common in people with chronic diseases.^[18] A number of studies have been conducted on the effect of health literacy on the health status of people,^[19] but there is no definite conclusion on the impact of health literacy on people's health.^[20] Inadequate health literacy regarding a health issue can affect people's self-efficacy in fulfilling their self-care program. Health literacy can lead to improved self-efficacy.^[17] Self-efficacy is recognized as a solution for self-care^[21] that leads to an increase in patients' self-confidence in self-care.^[18] Self-efficacy is introduced as one of the most important determinants and principles involved in the design and implementation of educational interventions.^[22] Self-efficacy is the strongest and most influential construct involved in changing people's behavior and increasing the mastery in performing a behavior.^[23] People who show higher levels of behavioral change are those with a higher self-efficacy to perform a behavior. Nevertheless, Seyedshohadae *et al.* (2015)^[14] found no significant correlation between health literacy and self-care behaviors. However, apparently previous studies have only investigated one or two variables of the concepts of health literacy, self-efficacy, and self-care behaviors, which have resulted in contradictory results.^[24] In some studies, health literacy has been sometimes taken into account as an equivalent for individuals' knowledge of a particular topic or general literacy; considering the significance of self-efficacy in disease self-management and adopting self-care behaviors to control the symptoms of COPD, evaluation of such components is of utmost importance.^[25]

Given the importance of promoting health literacy and the significant role of self-efficacy in improving the condition of people with COPD and lack of studies in this field in Iran, the present study was conducted to promote health literacy and self-efficacy in people with COPD.

Materials and Methods

The present article is extracted from a more comprehensive study whose aspects have been reported previously.^[22]

It was conducted between April and December 2019. This two-group quasi-experimental study was conducted on 70 patients with COPD admitted to Shahrekord educational hospitals. Based on a previous study^[26] and considering a power of 80%, $\alpha = 0.05$, $d = 39.48$, and $s = 1.55$ and dropout of 10%, 35 patients in the intervention group and 35 patients in the control group (70 patients) were recruited.

Inclusion criteria were as follows: full consent of the participants, the age range between 45 and 75 years,^[8] diagnosis of COPD by a specialist, being at the stage 2 of the disease based on global initiative for chronic obstructive lung disease (GOLD) classification (the stage of the disease was determined based on the results of spirometry test), and literacy of the patient or his/her companion. In case of withdrawal of a participant from the study or intensification of symptoms due to another disease, he/she was excluded from the study. Using random allocation software, the participants were randomly divided into intervention and control groups. In this study, the required data were collected using a demographic questionnaire, a health literacy questionnaire, and a researcher-made questionnaire to assess perceived self-efficacy.

In order to assess health literacy of the patients, a standard questionnaire was used, which was completed through interviewing the patients. This questionnaire was designed based on psychometric properties reported by Montazeri *et al.*^[27] for the Iranian population. Questionnaire had multiple-choice items and was easy to be used for a general population. Health literacy questionnaire had 33 items, including the topics of access (6 items), reading skills (4 items), comprehension (7 items), evaluation (4 items), and decision-making and utilization of health information (12 items). The researcher evaluated structure validity (using exploratory factor analysis) and its reliability (via calculating the internal correlation coefficient). The final results of the exploratory factor analysis showed that the questionnaire with 33 items in five areas had the desired level of construct validity, and was able to explain 3.2% of the changes observed. In addition, Cronbach's alpha coefficient was between 0.72 and 0.89 for the whole questionnaire, indicating good internal consistency.^[28]

Six five-choice questions were designed to assess the construct of self-efficacy. The items designed to evaluate self-efficacy were scored on a 5-point Likert scale from zero to four points, with a range of completely disagree (zero point), disagree (one point), no idea (two points), agree (three points), and completely agree (four points). In order to determine face validity, the questionnaire was presented to several health and nursing education specialists to express their perspective on the difficulty of understanding the concepts, ambiguity of the items, and the cases of misunderstandings. After applying the experts' opinion on the items, content validity of the

questionnaire was calculated in two ways: Content Validity Ratio (CVR) and Content Validity Index (CVI). In order to determine CVR for the necessity or non-necessity of each question, experts were consulted. CVR values higher than 0.56 were accepted based on the Lawshe table. In order to determine CVI, the criteria of relevance, clarity, and simplicity of each question were examined and values higher than 0.79 were accepted.^[28] After confirming validity, reliability of the perceived self-efficacy questionnaire was assessed on a pilot sample of 15 patients with COPD (this group was not included in the main study) and $\alpha = 0.81$ was reached.

Through conducting interviews in the pre-test stage, the researcher-made questionnaires were completed and the results were reviewed by the interviewer who had received the necessary training to complete the questionnaires. Based on the results obtained, the trainings were designed and approved by three faculty members of Nursing and Health faculty. Three training sessions with five to six participants in each session were held for 40 min led by a member of the research team. The trainings were provided to the intervention group using lectures, group discussion, questions and answers, and PowerPoint presentations in training classes held in the hospitals under the study.^[29,30]

The patients were provided with disease-specific content including trainings for increasing the awareness on disease, symptoms and the importance of physical activity, techniques to breathe properly, using sprays and oxygen and practicing, and education about associations and organs that help patients, and how to get proper education about the disease. In the session targeted to increase self-efficacy, the participants received trainings on the activities that help increasing self-efficacy. For instance, they were taught that they do not need to change their behavior all at once and in a short period of time, or change their eating habits abruptly and eat more meals with smaller amounts, consume at least 8–10 glasses of water during the day, or have proper and regular physical activity. Rather, they were recommended to be patient and achieve the desired behavior in small steps, and make promises with themselves that in case of performing the desired behavior, give themselves a small reward and use phrases such as well done, you can, and you are healthier from now on.

First, the patients were asked to draw a table on a piece of paper, write down the barriers to each behavior in one column and the facilitators of each behavior on the other side of the column. Then, the items were reviewed one by one and the best strategies to neutralize these barriers were extracted and written.

On the other hand, they were taught that controlling emotions such as anger, pleasure, fear, and anxiety along with proper use of those emotions was one of the important criteria for mental health. People who are able to identify and control their emotions have more appropriate reactions

to events. This type of control will lead to success and positive experiences, which in turn will promote self-efficacy. The patients were asked to identify and select appropriate patterns required for the desired behaviors. For example, they were asked whether they know someone who always and regularly uses spray or consumes more meals with smaller amount during the day. During the second and third training sessions, strategies for promoting health literacy, which include the promotion of verbal and written communication, empowerment and improving support systems were used as follows.^[30] Table 1: Educational content

At the end of each session, an educational pamphlet containing a regular and comprehensive set of all the points mentioned during the training sessions was provided to the

Table 1: Educational content

Subject	Content
Promote verbal communication	Simple and clear expressions were used in the trainings and in the educational pamphlets to make it easier for people to understand them. In addition, in all the trainings, the participants were encouraged to participate in discussions, questioning, and answering.
Improve written communication	The contents of educational pamphlets and slides were designed in a way to contain simple, short, and precise sentences to make them easier to read. Moreover, since understanding the content presented in images is simpler, images were used as educational materials.
Improve communication skills	The researcher tried to create effective communication via greeting, making eye contacts, using simple language and non-medical terms, speaking calmly, repeating key points, inviting the patients to participate in the discussion, and asking them to repeat the items taught.
Improve the support system	During the training process, an effort was made to create a warm and intimate environment and the patients were asked to share the training materials with their companions in order to obtain their support.
Ability to process information	The information were presented in a way that the patients' mental resources would cope with the vast information and the researchers considered the patients' ability to read, write and learn, and ability to share information with others (in other words, the ability to use the written word).
Engagement in own health	The patients were encouraged to take responsibility of their own life, understand their own condition, also willingly take responsibility of one's own health and wish to prioritize health. In other words, they were encouraged to make health a priority in their lives as compared with other issues.
Feel safe and in control	The patients were encouraged to trust that the information they present is not misused. So, this reflects the delicate nature of health data and confirmed that security was a high priority to members.

patients. During the same period of time, the patients in the control group received routine treatments and care services. After training the intervention group, the researcher made the necessary follow-ups via telephone calls (every 15 days) with the aim of reviewing the treatments and care services provided to patients.^[31] After three months, interviews were performed and the questionnaires were completed again by a research team member who was in charge of data collection.^[32] After the completion of educational interventions and three months after the intervention, post-test questionnaires were completed immediately by the researcher; the collected data were entered into SPSS software version 21 (IBM, USA) (Statistical package for social science) and analyzed using descriptive and analytical tests including t-test, Mann–Whitney test, Chi-square test, and repeated measures analysis of variance.

Ethical considerations

This study was approved by the ethics committee of Shahrekord University of Medical Sciences (IR.SKUMS.REC.1398.041). First hospital officials were briefed about the subject of the study, its objectives, and methods of training. In addition, the research objectives were described for the patients as well, and if they wished to participate in the study, a written informed consent was obtained. The patients were assured that all the collected data would remain confidential and there was no need to write down their name on the questionnaires. After the intervention, the educational content presented for the intervention group was also provided to the control group.

Results

Based on the results of independent t-test and Chi-square test, the two groups were similar in terms of all demographic characteristics, and there was no statistically significant difference between the two groups ($p > 0.05$). The mean (SD) age of the participants was 43.51 (6.21) years. Based on the results of the independent t-test, there was no significant difference between the intervention and control groups in terms of patients' age ($p = 0.45$). Other demographic characteristics of the patients are presented in Table 2.

The results of repeated measures analysis of variance indicated that the difference between the mean scores of perceived self-efficacy and health literacy in the intervention group was significant at different times (before the intervention, immediately and three months after the intervention) ($F = 93.4$ $p < 0.05$), but this difference was not significant in the control group at different times ($p < 0.05$) [Table 3].

Discussion

The aim of this study was to improve health literacy and self-efficacy in people with COPD in Shahrekord. Concerning the level of education and length of hospital

Table 2: Descriptive indicators of qualitative demographic variables in the studied participants

Variables	Frequency percentage intervention group (<i>n</i> =35) <i>n</i> (%)	Frequency percentage Control group (<i>n</i> =35) <i>n</i> (%)
Gender		
Male	16 (45.71)	18 (54.43)
Female	18 (54.29)	17 (46.57)
Education level		
Primary school	23 (65.71)	21 (59.96)
Primary high school	2 (5.71)	3 (9.57)
High school diploma	6 (17.14)	7 (20.09)
University education	3 (11.43)	3 (9.57)
History of smoking		
Yes	29 (79.21)	29 (79.32)
No	5 (20.79)	6 (20.68)
Job status		
Housewife	17 (51.13)	13 (41.15)
Clerk	7 (21.14)	9 (26.51)
Unemployed	6 (20.02)	6 (17.62)
Retired	4 (7.71)	7 (14.72)

stay, the results of the study of Masroor *et al.*^[30] in 2011 are in line with the results of the present study. According to the initial assessment, patients' health literacy scores were at a low level, and the results of a study by Kale *et al.*^[31] showed that most of patients with COPD had inadequate health literacy to control and treat their disease.

The findings of the present study indicated that the mean scores of self-efficacy immediately and three months after the intervention were higher in the intervention group than in the control group. The patients who achieved higher self-efficacy score after the interventions were successful in performing the behaviors. Learners' positive perceptions of their ability to perform the desired behavior affected their level of stimulation, and the sense of adequacy and competence helped them to keep practicing the behavior with enthusiasm and spend more time performing the desired behaviors. In the present study, patients with lower level of self-efficacy made less effort to perform the desired behaviors because they thought they could not perform the behaviors well, so we helped them to become familiar with appropriate role models (patients with higher self-efficacy).

Therefore, this group of people also made more efforts to improve self-efficacy and better practice behaviors related to disease control. Bashirian *et al.*^[32] conducted a study entitled "effect of educational programs based on the constructs of social cognitive theory on the promotion of nutritional behaviors of pregnant women" and the results of the study showed a significant increase in the scores of self-efficacy of mothers in the case group. Cavanaugh *et al.*^[33] and Kandula *et al.*^[34] achieved results

Table 3: Determining and comparing mean scores of perceived self-efficacy and health literacy before, immediately after, and three months after the intervention in case and control groups

Variable	Time of study	Intervention group Mean (SD)	Control group Mean (SD)	<i>p</i>
Perceived self-efficacy	Before the intervention	10.54 (4.19)	10.57 (5.20)	0.213
	Immediately after the intervention	12.94 (4.19)	10.77 (5.20)	<0.001
	Three months after the intervention	15.34 (4.02)	10.92 (5.20)	<0.001
Health literacy	Before the intervention	40.86 (22.65)	41.41 (28.88)	0.1
	Immediately after the intervention	51.69 (21.82)	41.25 (28.86)	<0.213
	Three months after the intervention	65.84 (17.39)	41.81 (28.55)	<0.001
Group interaction in time	<i>p</i>	< 0.001*	0.876*	

* Based on independent *t*-test

similar to those found in the present study, and the patients investigated in their study enjoyed adequate health literacy after receiving educational interventions.

The results of the study showed that designing and implementing a training program can make a significant difference in patients' health literacy and lead to an increase in self-efficacy in the intervention group. Furthermore, the findings of a study by Seif *et al.*^[35] showed a significant correlation between health literacy and the perception of self-efficacy in patients with cardiovascular diseases; it is consistent with the results of the present study. As one of the limitations of this study, the required data were gathered via self-report data collection method. Another limitation of the study was the short follow-up time, which lasted only three months after the intervention. Therefore, it is necessary to conduct more comprehensive studies, with longer durations to follow-up interventions and assess the durability of the effects of trainings, provide theory-based and targeted training for hospital staff members, and involve patients' families in trainings.

Since the training program increased health literacy and perceived self-efficacy in the patients, it is suggested to implement this program for COPD patients as a routine training program in a targeted manner carried out by the medical staff. On the other hand, not only the patients but also their family members should be considered as effective agents involved in encouraging and supporting patients; thus, they should be provided with the necessary trainings and the patients' condition should be followed at regular intervals and the training should be repeated if necessary.

Conclusion

The results of the study indicated that the educational intervention can increase perceived self-efficacy and health literacy in people with COPD. Therefore, the use of targeted educational interventions can have a positive effect on the treatment and control of the disease.

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Conflicts of interest

Nothing to declare.

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