Effect of Add-on "Self Management and Behavior Modification" Education on Severity of COPD

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ABSTRACT

Background: Chronic Obstructive Pulmonary Disease (COPD) is a chronic and plenty disease and one of the important causes of morbidity and mortality in the world with restrict available medical treatments. The objective of this study was to assess whether psycho-educational plans (self management and behavior modification) administered in primary care have beneficial effects on symptoms of patients with COPD.

Material and Methods: The study was a prospective, unblinded, randomized controlled trial of usual care vs. usual care plus structured education on the use of 8 sessions of "self management and behavior modification" group education: a simple educational package on life style modification and assumption of special behaviors in different situations of disease. The study was conducted in two educational hospitals (Khorshid & Alzahra) in Isfahan, Iran. Participants were 42 patients with COPD randomized into control or intervention groups. The primary outcome measure was change in severity of COPD symptoms that measured with "Clinical COPD Questionnaire" (CCQ). The data were analyzed with SPSS software and statistic examination called Ancova- Repeated measure and Mancova-Repeated measure.

Results: Self management and behavior modification education were associated with significant higher decrease in mean score of CCQ in symptom, functional state and mental state domains but had no effect on change in mean score of CCQ-Total.

Conclusion: Mean score of CCQ in symptom, functional state and mental state domains was lower in the intervention group but there was no difference in mean score of CCQ-Total due to "self-management and behavior modification" plans. **(Tanaffos 2008; 7(3): 23-30)**

Key words: *Self management, Behavior modification, COPD, Clinical COPD Questionnaire*

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is one of the main causes of morbidity and mortality in

industrialized and developing countries. Its related morbidity and mortality is increasing every year (1,2). It is estimated to be the third cause of morbidity and mortality and is projected to rank fifth in 2020 as a worldwide burden of disease (3). This disease is defined by periods of acute exacerbation

resulting in aggravation of patients' health status (4,5). Acute exacerbation of disease requires medical examination and results in hospitalization of patients (6,7). Almost 50% of COPD patients discharged from the hospital will be hospitalized again during the next year (5,8). Medications are the main therapy for COPD. However, education, exercise and psychosocial support may be important treatment modalities as well (9).

Self management and behavior modification are among the main psychosocial interventions in this regard. Self management is a practical program in the form of educational charts about symptoms of disease which teach the patients some skills needed to carry out specific medical regimens specific to the disease. In other words, self management can be described as a set of skilled behaviors and refers to the various tasks that a person carries out for management of their condition. The benefits of self-management have been measured by changes in health status and the use of health services (10). Although the number of published trials on self-management in COPD is limited, there is now evidence to suggest that it can improve health status (7,11-13), reduce emergency visits (7,14) and hospitalizations (7). There is also evidence that self management can increase the knowledge (15,16) and self-efficacy (17) of COPD patients for treating their disease. In a study, self management did not change dyspnea but improved the self efficacy significantly (18). In another study, hospitalization rate decreased to 40% in those who had participated in self management programs (19). Also in a study, education and self management decreased the mean number of patients requiring a visit by a general practitioner up to 85% and the absence from work up to 69% (14). However, there are some studies refusing the positive effect of self management on health status of COPD patients (20). Behavior modification implies the appropriate use of many

disease-related skills such as inhalation techniques, self-use of a prescription as a part of an action plan when the patient has an exacerbation, lifestyle behaviors such as smoking cessation, regular exercise, diet, sleep and sexual habits (7,10). Concerning the considerable prevalence of this disease, its chronic nature and lack of an effective medical treatment, psychoeducational care has been suggested as a treatment modality for COPD patents. However, there are controversial results in this respect (14,18-20) suggesting further investigations in this regard. This study aimed to evaluate the efficacy of a short term simple psychosocial intervention (educating self management and behavior modification) in COPD patients.

MATERIALS AND METHODS

This randomized clinical trial was performed on 42 COPD patients in the age range of 40-60 years in pulmonary clinics of Khorshid and Alzahra educational hospitals in Isfahan from April 2007 to November 2007. Our under-study patients were diagnosed by a pulmonologist according to American Thoracic Society criteria. The inclusion criteria included giving a consent for participation in the study, being literate and having sufficient knowledge (at least to understand and fill out the questionnaires), having physical and mental ability to tolerate the interventions, absence of disease that limit the function and other medical conditions affecting the mortality (i.e. malignancy, etc.).

The exclusion criteria included primary diagnosis of asthma, hospitalization during the intervention, main treatment with oxygen and occurrence of serious unexpected stresses during the study.

Sampling was consecutive and patients' clinical status was measured by using the clinical COPD questionnaire (CCQ)(21,22).

CCQ includes 10 questions that evaluate patient's

health status in three domains of symptoms (S), functional state (F) and mental state (M) during the previous week. Four questions are about the symptoms during the past week (shortness of breath at rest, shortness of breath during exercise, coughing and sputum production), 4 questions are about the patient's functional state during the past week (rate of heavy physical activities, rate of moderate physical activities, rate of performing daily routine tasks at home and rate of social activities) and 2 questions are about the patient's psychosocial status during the past week (fear about catching cold and exacerbation of breathing and depression due to respiratory problems). These questions are scored from 0 to 6. Based on conducted studies, reliability of the questionnaire according to Cronbach's α coefficient was 91% and its internal validity for symptoms domain, functional state domain and mental state domain was 0.78, 0.89 and 0.80 respectively. Results demonstrate that CCQ is valid, reliable and sensitive and can differentiate COPD patients based on their disease severity. CCQ is the first clinical tool used for routine clinical management of COPD patients in general practice (21).This questionnaire has been translated to 28 languages (22). To our knowledge, efficacy of this questionnaire has not been evaluated in Iran. Four pulmonologists stated that CCQ is a valid tool for evaluation of the severity of COPD. After filling out the questionnaires, patients were divided into two groups of intervention and control each with 21 patients. Both groups were under routine pharmaceutical treatment prescribed by the pulmonologists. Intervention group participated in eight 60-90 minutes educational sessions with 1 week interval in 3-4 member groups. Intervention comprised educational sessions on basic information about the disease, drugs, side effects and proper use

of drugs, respiratory techniques to minimize dyspnea and use of self management program in different conditions i.e. satisfaction of the patient from his/her general condition, moderate exacerbation of symptoms, severe exacerbation of symptoms and appearance of danger signs. Definition of each of the above conditions according to signs and symptoms was depicted in charts and given to the patients. Behavior modification included a healthy lifestyle, smoking cessation, avoid places with air pollution, healthy sleep, nutritional and sexual habits, stress management, free time activities, traveling, simple regular exercise program at home and behavioral interventions focusing on common issues like independence, decreased self-esteem, feeling insecure, limited relation with family and friends.

During this 8-week program, patients of the intervention group were followed up by phone.

Severity of disease was evaluated by using the CCQ questionnaire immediately after 8 sessions and 3 months later. After completion of questionnaire, data were entered into the SPSS software and analyzed using ANCOVA-Repeated measure and MANCOVA- Repeated measure.

RESULTS

There were 21 patients in the intervention group and 21 in the control group out of which 69% were males. Mean (±SD) age of patients was 56.4± 4.9 yrs (range 40-60 yrs). Frequency distribution of patients' (both groups) demographic characteristics including age, sex, marital status, level of education, occupation, number of hospitalization and duration of disease are summarized in Table 1.

Table 2 demonstrates mean and SD of CCQ-Total (CCQ-T) scores and scores of symptoms, mental state and functional state domains (CCQ-S,F,M) in both groups before, immediately after and 3 months after the intervention.

Table 1. Frequency distribution of patient's demographic characteristics

Patient characteristics		Intervention group N(%)	Control group N(%)	Statistical test	p-value
Sex	Male	13(61.9)	16(76.2)	Chi2	0.317
	Female	8(38.1)	5(23.8)		
Marital status	Married	15(71.4)	18(85.8)	Fisher Exact	0.454
	Single	6(28.6)	3(14.3)		
Level of education	Primary	17(81)	17(18)	Fisher Exact	0.100
	Secondary and more	4(19)	4(19)		
Occupation	Housewife	7(33.3)	5(23.8)	Chi2	0.142
	Employee	4(19)	10(47.6)		
	Retired	10(47.7)	6(28.6)		
Number of hospitalization	1	4(19)	5(23.8)	Chi2	0.799
	2	8(38.1)	6(28.6)		
	3-7	9(42.9)	10(47.6)		
Age	Mean±SD	56.6±5.7	56.2±4.1	t-test	0.807
Duration of disease	Mean±SD	8.9±4.7	7.9±3.5	t-test	0.420

Table 2. Mean ±SD of CCQ-total scores based on domains of symptoms (S), functional state (F), mental status (M) and Total (T).

	Intervention group			Control group		
	Before X(SD)	Immediately after X(SD)	3 months after X(SD)	Before X(SD)	Immediately after X(SD)	3 months after X(SD)
CCQ-S	2.71(0.63)	2.18(0.70)	2.01(6.1)	2.46(0.62)	2.46(0.55)	2.19(0.37)
CCG-F	2.57(0.68)	2.20(0.63)	2.02(0.66)	2.44(0.72)	2.38(0.64)	2.18(0.51)
CCQ-M	2.43(0.66)	2.10(0.68)	1.90(0.77)	2.59(1.09)	2.38(1.09)	2.31(0.87)
CCQ-T	2.60(0.53)	2.17(0.59)	1.99(0.60)	2.48(0.59)	2.41(0.54)	1.99(0.60)

Variance analysis test along with ANCOVA-repeated measure and MANCOVA repeated measure were separately used for CCQ-T and CCQ-S, F, M.

A- Although the decrease in mean score of CCQ-Total in the study group was more considerable than the control group immediately and 3 months after the intervention, the difference between the 2 groups was not statistically significant (p-value=0.074).

B- Decrease in mean score of CCQ-S, F, M immediately and 3 months after the intervention was significantly higher in the study group (p-value= 0.042). As seen in Table 1, decrease in CCQ score was more significant in the mental state domain (CCQ-M) compared to CCQ-S, F. Occupation and duration of disease have a significant effect on CCQ-Total and CCQ-S, F, M (Table 3).But considering the equal distribution of these 2 variables in 2 groups of study and control (Table 1), they did not interfere with the effect of intervention.

In general, psychoeducational intervention in this

study did not have a significant effect on severity of COPD in CCQ-Total, but significantly decreased the 3 domains of CCQ-S, F, M. Table 3 demonstrates the results along with the effect of other variables (Figure 1).

Table 3. The effect of psychological intervention and related variables.

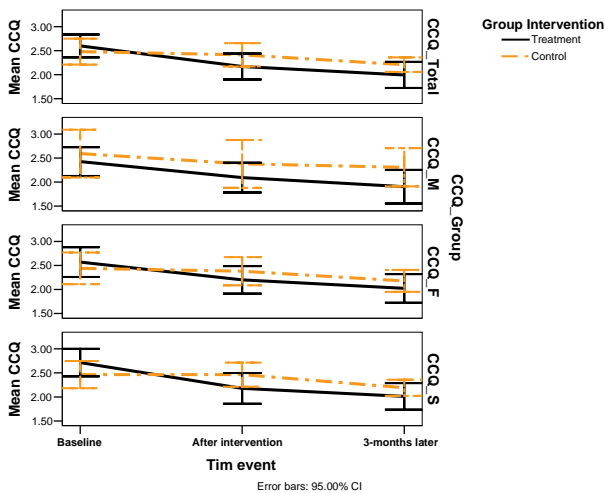| Variable	CCQ- Total		CCQ-S,F,M	
	F	p-value	F	p-value
Occupation	6.73	0.013	8.99	0.005
Duration of disease	6.01	0.019	5.14	0.029
Number of hospitalization	2.01	0.165	3.46	0.071
Psychoeducational intervention	3.38	0.074	4.44	0.042

Figure 1. The trend of changes in CCQ-total and CCQ-S,F,M in both groups.

DISCUSSION

Our study results demonstrated that although the CCQ- total score had a descending pattern before, immediately after and 3 months after the intervention in both groups (Figure 1), this decrease was not statistically significant. The amount of decrease in CCQ-total in the study group was higher than in the control group which may have clinical significance and the insignificant statistical difference in this regard may be due to the small under-study population.

McGeoch and colleagues in 2006 showed that self management methods had no effect on severity of COPD symptoms, improving health status or quality of life (20, 23). In a study by Monninkhof and colleagues in 2003, comprehensive self management programs and exercise programs did not have positive effect on patients with severe COPD (23). In contrast, in 2003 Bourbeau and colleagues in their study on 190 patients demonstrated that usual care and a continuum of self-management significantly reduced the utilization of healthcare services and emergency visits and improved the patients' quality of life (7). Van der Molen in his study showed that smoking cessation (a part of behavior modification in our study) significantly decreased the CCQ score (21). In another study, it was demonstrated that increasing the knowledge of COPD patients about the disease, smoking cessation and self-management programs in different disease conditions reduced the hospitalization rate up to 40% and decreased the number of emergency visits and emergency admissions (19). Another interesting point in our study was decrease in mean CCQ score during intervention in 3 domains of symptoms, functional and mental states and the amount of decrease in the study group was higher than in the control group. Decrease in CCQ score was more significant in the mental state domain compared to other domains (Table 1) indicating that psychosocial intervention is more effective on mental state including anxiety and depression due to the disease.

Depression is a common complication in COPD patients and its prevalence has reported to be 25-74% (24,25). Van Manen and colleagues reported the risk of depression to be 2.5 folds higher among the severe COPD patients compared to controls (24). Depression can affect quality of life (26, 27), function (28), COPD symptoms (24, 27, 29, 30) and treatment failure (15). In a study by Almagro and

colleagues in 2002, risk of mortality among COPD patients with depression was 3 times higher than in COPD patients without depression at the time of admission (31).

In McGeoch study, self-management trainings in a 1 year intervention did not change the score of depression and anxiety (20). But Nguyen et al. in their study in 2005 showed that self-management programs improved both dyspnea and depression in moderate to severe COPD patients (32). Zimmerman and colleagues in 1996 demonstrated that although self-management programs did not impact on dyspnea, increased the self-efficacy in patients (18). Gallefoss also showed that training can affect acceptance of treatment and use of proper therapeutic methods in COPD patients (33).

In a chronic disease like COPD there are correlations between severity of symptoms, quality of life, anxiety, depression, compliance to treatment, number of emergency visits, number of hospitalizations, patient's function and morbidity and mortality. Some of these correlations have been evaluated and confirmed in experimental studies i.e. the correlation between severity of disease and increased number of visits to the physician and decreased quality of life (14). Therefore, although the results of psychoeducational training have been different in various studies, considering the correlation between these variables we can conclude that such interventions in general can improve the health status and quality of life in COPD patients.

The important point in this regard is that the patients can tolerate such interventions. Watson in 1997 stated that self-management training should be practical and performable in primary care network and the patients should be able to tolerate and learn it well (34). In this study we had face to face training sessions and tried to offer patients a complete training. We also encouraged and followed up the patients by phone and even when someone was absent, we teached him/her over the phone. In this way, all patients accompanied us till the end of the course and no patient was excluded from the study.

CONCLUSION

Psychoeducational intervention as self-management and behavior modification decreases the severity of COPD in 3 domains of its symptoms and patients' functional and mental state.

Acknowledgement

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