

Awareness of Patients with Chronic Obstructive Pulmonary Disease with Dyspnea and Fatigue Self-Management Guidelines

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Abstract: Dyspnea and fatigue are the two most common symptoms experienced by patients with chronic obstructive pulmonary disease (COPD). The aim of the study is to evaluate the awareness level with dyspnea and fatigue management guidelines and patients' self-care practices among patients with COPD. Methods: A purposeful sample of 125 adult patients was selected from the respiratory disease clinic at King Abdulaziz University Hospital, Jeddah. Patients were assessed using clinical data sheet, Patient's Dyspnea and Fatigue Knowledge Questionnaire, Patients' Practices Observational Checklists, Modified Borg Scale (MBS) and Hospital Anxiety and Depression Scale (HADS). Results: The results revealed that the majority of patients (>50%) had unsatisfactory knowledge and self-care practice regarding dyspnea and fatigue management guidelines. Conclusions: Patients with COPD need to be more knowledgeable about their dyspnea and fatigue management guidelines and should share in developing the treatment strategy.

Key words: Dyspnea • Fatigue • Chronic Obstructive Pulmonary Disease

INTRODUCTION

Chronic obstructive pulmonary disease is characterized by airflow limitation that is not fully reversible. The airflow limitation is usually both progressive and associated with an abnormal inflammatory response of the lungs to noxious particles and gases. It results from airway narrowing and loss of elastic recoil that result from these pathologic processes [1]. Airflow obstruction is usually accompanied with symptoms such as chronic cough, exertion dyspnea, fatigue, expectoration and wheeze. It is a significant disease which affects the individual physically, emotionally and socially and leads to an increase in the social support needs of the patients [2]. The primary cause of COPD is tobacco smoke but other risk factors include indoor and outdoor air pollution; occupational dusts and lower respiratory tract infections during childhood. Almost 90% of COPD deaths occur in low- and

middle-income countries, where effective strategies for prevention and control are not always implemented or accessible [3]. The prevalence of COPD in the middle east and north Africa seems to be lower than that reported in industrialized countries. Under reporting and risk factors other than smoking may contribute to that report [4]. It is the fourth leading cause of death worldwide [5] and will be the third leading cause of death globally by 2020 and it will be the fifth leading cause of lost disability adjusted life years [6].

Several studies from Saudi Arabia over the past 20 years have shown a progressive increase in smoking, particularly among men of younger age groups and women [7]. In a large study of 8310 subjects, the overall prevalence of cigarette smoking among Saudi nationals in three regions of Saudi Arabia was 21.1% for males and 0.9% for females [8]. Most smokers (78%) were young to middle-aged. Additionally, one study from Riyadh showed that 13% of male medical students were active

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smokers, 5.3% were ex-smokers and 38.2% were passive smokers [9]. Moreover, two surveys in the KSA in 2002 and 2007 revealed an increase in the prevalence of water pipe smoking from 6.8 to 8.7% among students aged 13-15 years [10].

Dyspnea and fatigue are the two most common symptoms experienced by patients with COPD. Dyspnea also called breathlessness or shortness of breath, in which the patients experience labored, uncomfortable breathing and may produce secondary physiological, emotional, cognitive and behavioral responses [2].

Another accompanying important symptom to dyspnea is fatigue which is subjective, unpleasant symptom that incorporates total body feelings ranging from tiredness to exhaustion and interferes with the ability to function at normal capacity [11].

Both dyspnea and fatigue are subjective experiences that can only be measured from the patient's perceptions, because every person have different thresholds for noticing, reporting and rating the severity of these symptoms [12]. In several studies, it was found out that, there is a significant correlation between dyspnea, fatigue and physical activity and that fatigue levels increase when dyspnea intensifies and physical activity levels reduce [13].

When COPD patients start to feel shortness of breath, they worry that they are not getting enough air, leading to anxiety that makes them breath harder and faster, this worsens dyspnea. When people experience this, it can be so distressing that they start to limit their activities in order to avoid anything might cause them feel shortness of breath as they get into dyspnea cycle. The dyspnea cycle is not only frightening but can lead to feelings of sadness and worry. If these feelings become overwhelming, they can start to interfere with daily life [14].

To improve dyspnea and fatigue, several non-pharmacologic approaches have been suggested, with a focus on nutrition, training of inspiratory muscles, relaxation techniques and positioning [15]. Providing information and education is foundational to enhance the patient and family's ability to cope with the disease. Patient's education is a critical component of COPD management and fundamental to increase the patient's ability to self-manage the disease. Educational interventions that increase knowledge alone are insufficient; patients must also integrate the knowledge and tools they learn into their daily lives leading to behavior modification. Education offered in their preferred learning style is more likely to lead to successful learning and increases learner satisfaction [16].

Aim of the Study: The aim of the current study was to evaluate the awareness level with dyspnea and fatigue management guidelines and patients' self-care practices among patients with COPD.

MATERIALS AND METHODS

Subjects: A sample of 125 adult male patients with COPD stage II and III participated in the study. Exclusion criteria: Patients who had airflow limitation due to pulmonary tuberculosis, bronchial asthma, bronchiectasis or heart failure and patients with cognitive impairments.

Procedures: The study started from November 2013 to March 2014. An official approval was obtained from the directors of KAU hospital and the head of the respiratory disease clinic. A written informed consent form, approved by Research Ethical Committee of the faculty of applied medical sciences at King Abdulaziz University, was signed from all enrolled patients.

All questionnaires were distributed to patients to assess their educational needs and to obtain baseline data with response rate of 80%.

Patient's Assessment and Clinical Data Sheet: The assessment sheet was designed by the researchers to gather information related to patient's demographic characteristics. It also covered data related to duration of illness, severity of the disease, repeated hospitalization and associated signs and symptoms.

Modified Borg Scale (MBS): This tool is a subjective perception used to assess the severity of dyspnea during various activities using vertical 0 - 10 item scale with words describing degrees of perceived exertion anchored to numbers [17].

The scores given by each patient were summed up and divided by the total number of patients, giving a mean score for the scale.

Patient's Dyspnea and Fatigue Knowledge Questionnaire: This tool was developed by the researchers in Arabic language. It included controlling dyspnea and fatigue, energy conservation, breathing exercises, relaxation techniques and respiratory muscles exercises.

The total scores were 50 scores. Score one was given for each correct answer and zero for incorrect answer. For each area of knowledge, the scores of the items were summed-up and the total score was divided by the number of the items, giving a mean score for the area and

was converted into a percent score. The total patients' knowledge scores were considered satisfactory if the percent score was 70% and more and unsatisfactory if it was less than 70%.

Patients' Practices Observational Checklists: It was adopted from that of Cleary *et al.* [18]. For scoring the checklist, one score was given for done items and zero for not done items and the scores of the items were summed-up and converted into a percent. For every checklist, patients' scores were considered adequate if the percent score was 70% and more and inadequate if it was less than 70%.

Hospital Anxiety and Depression Scale (HADS): This tool is a valid and reliable tool to assess anxiety and depression state associated with dyspnea among COPD patients. It was adopted from Zigmond and Snaith [19] and was used in the current work for anxiety only. It includes 14-items questionnaire measuring anxiety and depression in two separate subscales of which, seven items measure symptoms of depression occurring in the past week, while the remainder measure symptoms of anxiety occurring in the past week. Each item is rated on a four-point scale; (0=No, not at all, 1=No, not much, 2=Yes sometimes and 3 =Yes definitely). Item scores are summed to give sub-scores for anxiety and depression. Scores can range between 0 and 21 for every subscale.

Statistical Analysis: Data statistical analysis was done using the statistical package for social sciences (SPSS) version 16. Data were presented using descriptive statistics in the form of mean, standard deviations and percentages.

RESULTS

General Characteristics of the Study Sample: The characteristics of the study sample are described in Table (1). It was shown that more than half of patients (58%) were 50 years age or older, with the whole study sample (100%) were males. Half of the study sample (50%) has basic level of education, 25% of the study sample was white collar and 74% were smoking.

Clinical Characteristics of Patients: Table (2) describes the clinical characteristics of patients. As regards the duration of illness, it was showed that more than half of the patients (57%) were diagnosed as COPD for more than one year and 70.0% of the study sample had COPD stage

Table 1: General characteristics of the study sample.

Group N = 100		
General characteristics	No	%
Age		
40 +	10	10%
50 +	58	58%
60 +	32	32%
Range	42 - 69	
Mean ± SD	53 ± 6.3	
Gender		
Male	100	100%
Education Level		
Illiterate	14	14%
Basic education	23	23%
Middle education	27	27%
Higher education	36	36%
Occupation		
White collar	25	25%
Blue collar	31	31%
Exposed to irritants	38	38%
Retired	6	6%
Smoking		
Yes	74	74%
No	26	26%

Table 2: Clinical characteristics of the studied patients.

Group N = 100		
Clinical characteristics	No	%
Duration of illness		
<one year	43	43%
>one year	57	57%
Disease Severity		
Stage II (Moderate)	70	70%
Stage III (Severe)	30	30%
Repeated Hospitalization		
No	59	59%
Once	32	32%
Twice	5	5%
Three times and more	4	4%

II (moderate) severity of the disease. Meanwhile, 59.0% of them were not hospitalized before and only 4.0% were hospitalized three times before or more.

Patients' Signs and Symptoms Associated with Dyspnea: Table (3) shows the incidence of associated dyspnea signs and symptoms. The highest percent was for the feeling of suffocation or smothering (95%).

Severity of Dyspnea and Anxiety Level: According to Modified Borg scale, the findings revealed that more than two third of the studied patients (68%) had moderate dyspnea. On the other hand, 62 % of patients had severe anxiety followed by 25% of them had moderate anxiety and 13% of them had mild anxiety (Table 4).

Table 3: Patients' signs and symptoms associated with dyspnea.

Dyspnea associated signs and symptoms	No	%
1- Difficult or labored breathing		
Yes	83	83
No	17	17
2- Feeling of suffocation or smothering		
Yes	95	95
No	5	5
3- Tightness in the chest		
Yes	54	54
No	46	46
4- Inability to get enough air		
Yes	64	64
No	36	36

Table 4: Severity of the dyspnea and anxiety level among studied patients.

Dyspnea Borg scale (Max.=10)	No	%
Non	0	0
Mild (1-3)	18	18
Moderate (4-7)	68	68
Severe (8-10)	14	14
Mean score MBS (0-10)	6±1.1	
Anxiety level		
Normal	0	0
Mild	13	13
Moderate	25	25
Severe	62	62

Table 5: Patient's level of dyspnea and fatigue knowledge.

Knowledge items (satisfactory level)	No	%
Information about COPD	0	0
Controlling dyspnea	24	24
Energy conservation	52	52
Breathing exercises	10	10
Relaxation techniques	12	12
Respiratory muscles exercises	0	0
Total satisfactory knowledge	0	0

Table 6: Level of self-care practices.

Self-care practices (satisfactory level)	No	%
Breathing exercises	10	10
Relaxation techniques	12	12
Respiratory muscles exercises	0	0
Inhaler use	11	11

Patient's Level of Dyspnea and Fatigue Knowledge:

Table (5) shows that most of the patients had unsatisfactory level of knowledge for all items except for energy conservation (52%).

Level of Self-Care Practices: It was shown that only 10-12% of patients had satisfactory level of self-care practices (Table 6).

DISCUSSION

Regarding the characteristics of the patients under study, nearly two fifth of the sample was blue collar, this may be due to the high prevalence of COPD between blue collar who are exposed to irritants at their work place which are inhaled into their lungs causing serious lung damage as most of those patients were working as solders, tanners or turners.

In addition, it was found that the majority of the studied subjects were smoking. In the same line, it was reported that COPD most often occurs in people age 40 and over with a history of smoking (either current or former smokers), although as many as one out of six people with COPD never smoked. Smoking is the most common cause of COPD as it accounts for as many as nine out of ten COPD-related deaths [20].

As regards the clinical characteristics of the studied subjects, it was found that more than half of the patients had a disease more than one year and had moderate COPD (stage II) and less than half of them were hospitalized before. This result was similar to that of Baghai-Ravary *et al.* [21] who reported that hospitalization rates in the patients with COPD are high and increase with age.

Moreover, the data in the current study revealed that near half of the study sample had dyspnea grade three. This finding goes in the same line with Wong *et al.* [15] who found that 53.3% of participants in their study reported dyspnea at Grade three level.

The findings of the present research showed that 62 % of patients had severe anxiety in accordance to Cleary *et al.* [18]. In the same line, Maurer *et al.* [22] found that anxiety is very common co-morbidity in COPD and has significant impact on patients, their families, society and the course of the disease.

In other aspect, the main goal of patient's education is to improve clinical outcomes by teaching appropriate self-management skill. Knowing as much as patient can about COPD, concerning diagnosis and associated problems and when the patient is actively involved in decision making and the development of a management plan with the health care professional, may lead to promotion of the patient health status [18]. On the contrary, the present work results revealed that none of patients had satisfactory knowledge about dyspnea and fatigue self-management meaning that those patients need to be informed more about the nature of the disease and management guidelines of both dyspnea and fatigue.

Regarding patients' level of self-practice, the findings showed that only 10-12% of patients had satisfactory level of self care practice regarding breathing exercises, relaxation techniques and inhaler use and none of them practiced respiratory muscles exercises before. This may be due to the unfamiliarity of the patients with this type of management. Coping with a chronic condition involves skills, training, learning to manage a number of symptoms and consciously assessing and making lifestyle changes. Experience has shown that those who develop a management plan with their health care team and follow it can live better with COPD [23].

Planning time to relax daily is important. Relaxation can be formal, as guided relaxation practice, or informal, as watching football or listening to Quran. Formal relaxation practice helps to enhance the metabolism, slow the heart rate, relax the muscles, slow the breathing and lower the blood pressure [24].

Meanwhile, the patient with COPD should share in developing a management plan, including: quitting smoking and preventing relapse, knowing the medication needed, using the inhalation devices and preventing and managing flare up, exercise and physical activity, dyspnea, breathing control and energy conservation, airway clearance: keeping lungs clear, home oxygen therapy and managing stress, anxiety and depression [25].

Finally, fatigue may be affected by dyspnea and is frequently told by the COPD patients¹⁵. So, improvement in dyspnea can be associated with decreased level of fatigue, as dyspnea is associated with an increased work of breathing and an increase in energy consumption and may contribute to the perception of fatigue in patients with COPD [26].

CONCLUSION

Patients with COPD need to be more knowledgeable about their dyspnea and fatigue management guidelines and should share in developing the treatment strategy.
Conflict of interest: None

REFERENCES

1. Global Initiative for Chronic Obstructive Lung Disease (GOLD). Global strategy for the diagnosis, management and prevention of chronic obstructive pulmonary disease. Available at: <http://goldcopd.com/Guidelineitem.asp?11=2&12=1&intld=989,2005>.
2. Aras, A. and H. Tel, 2009. Determination of perceived social support for patients with COPD and related factors. Turkish Thorax Journal, 10(2): 63-68.
3. World Health Organization (WHO): Chronic obstructive pulmonary disease (COPD), Fact sheet No. 315, Reviewed October 2013.
4. Tageldin, M., S. Nafti, J. Khan, C. Nejjari, M. Beji, B. Mahboub, E. Uzaslan, A. Sayiner, S. Wali, N. Rashid and A. El-Hasnaoui, 2012. Distribution of COPD-related symptoms in the Middle East and North Africa: Results of the BREATHE study. Respir Med; 106 Suppl 2: S25-32.
5. World Health Organization. Global Status report on non-communicable diseases. WHO publication, 2011. Available from: www.who.int/nmh/publications/ncd_report_2010
6. Tkacova, R., 2010. Systemic inflammation in chronic obstructive pulmonary disease: May adipose tissue play a role? review of the literature and future perspectives. Mediators of Inflammation, pp: 1-11.
7. Jarallah, J., K. Al-Rubeaan, A. Al-Nuaim, A. Al-Ruhaily and K. Kalantan, 1999. Prevalence and determinants of smoking in three regions of Saudi Arabia. Tob Control, 8: 53-56.
8. Idrees, M., M. Koniski, S. Taright, N. Shahrour, M. Polatli, A. Ben Kheder, A. Alzaabi, G. Iraqi, A. Khattab, A. Javed, N. Rashid, A. El Hasnaoui, 2012. Management of chronic obstructive pulmonary disease in the Middle East and North Africa. Respir Med., 106 Suppl 2: S33-44.
9. Smeltzer, S., B. Bare, J. Hinkle and K. Cheever, 2010. Text book of medical surgical nursing. 8th ed. Philadelphia: Saunders Co.
10. Alzeidan, R., A. Mandil, A. Fayed and H. Wahabi, 2013. The effectiveness of breath carbon monoxide analyzer in screening for environmental tobacco smoke exposure in Saudi pregnant women. Ann. Thorac Med., 8: 214-217.
11. Swain, M., 2000. Fatigue in Chronic Disease. Clinical Science, 99: 1-8.
12. Victorson, D., S. Anton, A. Hamilton, S. Yount and D. Cella, 2009. A conceptual model of the experience of dyspnea and functional limitations in Chronic Obstructive Pulmonary Disease. Value in Health, 12: 1018-25.
13. Theander, K. and M. Unosson, 2004. Fatigue in patients with chronic obstructive pulmonary disease. Journal of Advanced Nursing, 45: 172-7.

14. Talbot, F., 2012. What is Dyspnea? COPD Foundation. Available at: <http://blog.copdfoundation.org/what-is-dyspnea>.
15. Wong, C., D. Goodridge, D. Marciniuk and D. Rennie, 2010. Fatigue in patients with COPD participating in a pulmonary rehabilitation program. *International Journal of Chronic Obstructive Pulmonary Disease*, 5: 319-326.
16. Knowles, M., E. Holton and R. Swanson, 2005. *The adult learner: the definitive classic in adult education and human resource development*. 6th ed. San Diego: Elsevier Inc.
17. Borg, G., 1982. Psychophysical bases of perceived exertion. *Medicine and Science in Sports and Exercise*, 14 (5): 377-381.
18. Cleary, M. and D. Serisier, 2012. *Better Living with Chronic Obstructive Pulmonary Disease: a Patient Guide*. 2nd ed. Queensland: Queensland health and the Australian Lung Foundation.
19. Zigmond, A. and R. Snaith, 1983. The hospital anxiety and depression scale. *Acta Psychiatr Scand*, 67: 361.
20. National Heart, Lung and Blood Institute. COPD: Are You at Risk? Available at <http://www.nhlbi.nih.gov/health/educational/copd/am-i-at-risk/> [accessed 2014 Oct].
21. Baghai-Ravary, R., J. Quint, J. Goldring, J. Hurst, G. Donaldson and J. Wedzicha, 2009. Determinants and impact of fatigue in patients with chronic obstructive pulmonary disease. *Respiratory Medicine*, 103: 216-223.
22. Maurer, J., V. Rebbapragada, S. Borson, R. Goldstein, M. Kunik, A. Yohannes, N. Hanania, 2008. Anxiety and depression in COPD: Current understanding, unanswered questions and research needs. *Chest*, 134(4 Suppl): 43S-56S.
23. Ries, A., G. Bauldoff, B. Carlin, R. Casaburi, C. Emery, D. Mahler, B. Make, C. Rochester, R. Zuwallack and C. Herrerias, 2007. *Pulmonary Rehabilitation: Joint ACCP/AACVPR Evidence Based Clinical Practice Guidelines*. *Chest*; 131: 4S-42S.
24. Garcia-Aymerich, J., P. Lange, M. Benet, P. Schnohr and J. Antó, 2006. Regular physical activity reduces hospital admission and mortality in chronic obstructive pulmonary disease: A population based cohort study. *Thorax*, 61: 772-778.
25. Velloso, M. and J. Jardim, 2006. Functionality of patients with chronic obstructive pulmonary disease: Energy conservation techniques. *Journal Brazilian Pneumol*, 32(6): 580-586.
26. Breslin, E., C. van der Schans, S. Breukink, P. Meek, K. Mercer, W. Volz and S. Louie, 1998. Perception of fatigue and quality of life in patients with COPD. *Chest*, 114(4): 958-964.