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Dyspnea Experience and Dyspnea Management in Patients with Chronic Obstructive Pulmonary Disease in Bangladesh

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Purpose: This study aimed to evaluate dyspnea experience and dyspnea management intervention used by Chronic Obstructive Pulmonary Disease (COPD) patients in Bangladesh.
Methods: A descriptive cross-sectional design was used. The symptom management model developed by Dodd et al. was used to guide the study. Data were collected from 140 COPD patients by using self-report questionnaire. Descriptive statistics was used to analyze the data.
Results: The patients perceived dyspnea difficulty within the past 24 hours and within the past 7 days at moderate level. The most used dyspnea management methods included bronchodilators, leaning forward position, and keeping still. The patients perceived bronchodilators as somewhat effective method and perceived leaning forward position as quite a bit effective method in reducing dyspnea.
Conclusion: The study could guide nurses to promote dyspnea management intervention for COPD patients in Bangladesh, in order to enhance higher quality of life.

Key words: COPD, dyspnea, dyspnea experience, dyspnea management.

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Introduction

Chronic Obstructive Pulmonary Disease (COPD) is an important public health problem worldwide. It is the major cause of chronic morbidity and mortality (Global Initiative for Chronic Obstructive Lung Disease [GOLD] 2013). Approximately, 210 million people suffer from COPD and 3 million people die every year because of COPD, which will become the third leading cause of death in the world by 2030 (WHO, 2008). In Bangladesh, formal reports on the prevalence of disease are limited for assessing. One study conducted in Bangladesh reported the prevalence of COPD among patients attending at the outpatient department (OPD) was 0.7% and among the inpatient department (IPD) was about 5.9% (Ilias, et al., 2009). Factors associated with increase prevalence of COPD in Bangladesh may relate to smoking habit (Alam, et al., 2013) occupational dust and chemicals, outdoor and indoor air pollution, and environmental change (Ilias, et al., 2009).

Regarding signs and symptoms of COPD, dyspnea is the most suffering and devastating symptom. Dyspnea is a subjective experience of breathing discomfort that consists of qualitative, distinct sensations that vary in both intensity, and relations among multiple physiological, psychological, social, and environmental factors, which may stimulate secondary physiological and behavioral responses (Spector, Connolly, & Carlson, 2007). The causes of dyspnea in COPD patients included progressive airway obstruction, pulmonary hyperinflation, hypoxemia, hypercapnia, pulmonary hypertension, pulmonary embolism, respiratory infection, anxiety and depression, as well (Jantarakupt & Porock, 2005). The effects of COPD contribute to the deterioration of health status, functional abilities, and quality of life. Physically, the effects of COPD are muscle wasting, reducing fat free mass, osteopenia (low mineral density in bone), chronic infections, airway reactivity, abnormal cellular repair, and development of complications or comorbid diseases.

Dyspnea management methods used among COPD patients aimed to relieve symptoms, prevent the progression of disease, prevent and treat secondary infections or complications, prevent and treat exacerbation, improve health status, reduce mortality, and increase quality of life (Pauwels, Buist, Calverley, Jenkins, & Hurd, 2001). Both pharmacological and non-pharmacological methods can be used to reduce dyspnea. Pharmacological method consists of using bronchodilators (short and long acting), morphine, antianxiety drugs, local anesthetics, antibiotics, inhaled glucocorticosteroids, combination therapy, mucolytic agents, and oxygen. Bronchodilators such as beta agonist (albuterol), anticholinergics (oxitropium), and methylxanthines (theophylline) are used to relieve dyspnea (Jantarakupt & Porock, 2005). Non-pharmacological method consists of using breathing exercises, energy conservation, exercise, environmental adjustment, nutritional management, relaxation techniques, education and behavioral approaches (ATS, 1999).

In Bangladesh, COPD is a common clinical problem. It is difficult to manage dyspnea among these COPD patients because treatment facilities are not always available. There is only one tertiary level referral hospital for COPD patients. This hospital can serve for a limited number of patients among the increased prevalence of COPD, with health professional shortage, and inadequate supply of medicine (Alam, Hossain, Robinson, Hasan, & Kanungo, 2013). Dyspnea management is important for the COPD patients to relieve their symptoms as it can prevent complication and slow the progression of the disease. Currently, no existing study examined dyspnea experience and dyspnea management among COPD patients in Bangladesh. The present study aimed to determine dyspnea difficulty and dyspnea management used by COPD patients in Bangladesh.

Methods

A descriptive cross-sectional study was used to determine dyspnea experience and dyspnea management in COPD patients in Bangladesh. The approval was obtained from the Research Ethics Committee of the Faculty of Nursing, Prince of Songkla University, Thailand, and from the Director of NIDCH, Mohakhali, Dhaka, Bangladesh.

The data were collected at the OPD of the NIDCH between January and March, 2013. The purposive sampling method was used to recruit the patients. Potential participants were explained about details of the study and were informed that they had the right to withdraw from the study any time with no harm. Participants who decided to participate in the study were asked to sign the consent form. Total of 140 COPD patients were selected based on the following inclusion criteria: (1) age 30 years or over, (2) clinical diagnosis of COPD as defined by the doctors, (3) diagnosis of COPD > 1 year, (4) having dyspnea symptoms within 3 months, and (5) be able to communicate in Bengali language.

The questionnaire used to collect data in this study included 3 parts: 1) the demographic and health-related data form (DHRDF), 2) the dyspnea numeric rating scale (DNRS), and 3) the dyspnea intervention scale (DIS). The DHRDF consisted of age, gender, marital status, religion, educational level, occupation, family income, residential area, number of family members, family history of COPD, smoking habits, co-morbid disease, duration of being diagnosed with COPD, information regarding dyspnea management, medical payment, and use of medication. The DNRS composed of two parts. The first part consisted of 2 items to assess dyspnea difficulty within the past 24 hours and within the past 7 days. The answer was numeric scale ranging from 0 means no difficulty, 1- 3 mild difficulty, 4 - 6 moderate difficulty, 7- 10 most difficulty. The second part of the DNRS consisted of 2 items to assess frequency of dyspnea within the past 24 hours and within the past 7 days. For frequency of dyspnea within 24 hours, the answer was rating scale ranged from 1(not at all) to 4 (having

breathing difficulty > 4 times). For frequency of dyspnea within the past 7 days, the answer was rating scale ranged from 1(not at all) to 5 (having breathing difficulty everyday).

The DIS was developed to assess the frequency of using dyspnea management methods and the effectiveness of each method as perceived by the patients. The DIS composed of two parts consisting of 14 items. The first part assessed the frequency of using dyspnea management methods. The answer of this part consists of 5 responses ranging from 0 (did not use) to 4 (use almost constantly). The second part of the DIS assessed the effectiveness of each dyspnea management method. The answer of this part consisted of 5 responses ranging from 0 (not at all effective) to 4 (very much effective).

The content was validated by three experts. The reliability of the DNRS was tested by using test-retest reliability yielded coefficient of .73 for dyspnea difficulty within the past 24 hours; 1 for dyspnea difficulty within the past 7 days; and 1 for dyspnea frequency within the past 24 hours and within the past 7 days. The reliability of the DIS yielded a Cronbach's alpha coefficient of .75. Demographic data, dyspnea numeric rating scale, and dyspnea intervention scale were analyzed by using descriptive statistics.

Results

Demographic data

The majority of the patients were adult male (69.3%), Muslims (90%), and age ranged from 30 to 80 years. More than one third of the patients were illiterate (40.7%), lived in urban areas (41.1%), and earned low income (33.6%). Their occupation included: farmer/labor/ driver (27.8%), service (26.4%), housewife (25.7%), and businessman (20%). Most of the patients (95.7%) paid their medical payment by themselves.

Most of the patients (85.7%) had no family history of COPD. Majority of the patients got help from their wife (62.1%). Most of the patients (64.3%) had history of smoking; 22%

of the patients had co-morbid disease. Nearly half of the patients (44.7%) were currently stopped smoking, where as one third were non smoker (35.7%), and only 10.7% still smoked. Nearly 60% of the patients had diagnosed with COPD last from 1 to 5 years (table 1).

Table 1 *Demographic Characteristics (N=140)*

Characteristics	Frequency	Percentage
Age (Years old) (M = 55. 1, SD = 10.5, Minimum =30 Maximum = 80)		
30- 50	51	36.4
51- 70	88	61.5
71- 80	3	2.1
Gender		
Male	97	69.3
Female	43	30.7
Religion		
Muslim	126	90.0
Hindu	11	7.9
Christian	3	2.1
Educational level		
Up to Primary school	93	66.4
Secondary School	25	17.9
Higher secondary school/ University	22	15.7
Family history of COPD		
No	120	85.7
Yes	20	14.3
Having caregiver to help		
Wife	87	62,1
Husband	21	15.0
Son/ Daughter	29	20.8
Mother / Friends	3	2.1
Smoking Habit		
ex-smoker & smoker	90	64.3
non-smoker	50	35.7
Co-morbid disease		
No	109	77.9
Yes	31	22.1
Medical Payment		
Self-support	134	95.7
Others	6	4.3
Duration of diagnosis of COPD (M = 5.40, SD = 2.98)		
1-5 Years	83	59.3
6 Years or more	57	40.7

Dyspnea difficulty

The result showed that patients have dyspnea difficulty within the 24 hours and within the past 7 days at moderate level (M = 5.01, SD = 2.13, and M = 4.65, SD = 1.93 respectively), as presented in table 2.

Table 2 *Mean and Standard Deviation of Dyspnea Difficulty within the past 24 hours and within 7 days (N=140)*

Dyspnea difficulty (Range 0 – 10)	M	SD	Level
Severity of dyspnea within the past 24 hours	5.01	2.13	Moderate
Severity of dyspnea within the past 7 days	4.66	1.93	Moderate

Frequency of dyspnea

Regarding frequency of dyspnea, nearly 56% of the patients had dyspnea more than 4 times within the past 24 hours; 78% of the patients had dyspnea every day within the past 7 days (table 3).

Table 3 *Frequency and Percentage of Dyspnea Frequency within 24 hours and within 7 days (N=140)*

Dyspnea frequency	n	Percentage
within 24 hours		
Having breathing difficulty 1-2 times	12	8.6
Having breathing difficulty 3-4 times	50	35.7
Having breathing difficulty > 4 times	78	55.7
within 7 days		
Have breathing difficulty 1-2 times	2	1.4
Have breathing difficulty 3-4 times	4	2.9
Have breathing difficulty > 4 times	25	17.9
Have breathing difficulty every day	109	77.9

Dyspnea management intervention

Dyspnea management intervention used most by the patients in this study included inhaled bronchodilators, leaning forward position, and keeping still. The most frequently used methods were bronchodilators and leaning forward position (M = 2.99, SD = .86; M = 2.90, SD = 1.02, respectively). Dyspnea management intervention which used less by the patients in

this study included oxygen inhalation, practice breathing exercise, and other interventions (traditional healers/kabiraj) as presented in table 4

Table 4 *Mean and SD of the Frequency in Using Dyspnea Management Intervention (N= 140)*

Dyspnea management intervention	Mean	SD
Use of bronchodilators	2.99	.86
Lean forward position	2.90	1.02
Kept still	2.11	1.01
Transfer activity to others	1.86	.97
Moved slowly	1.67	1.30
Avoided to contact dust	.96	1.11
Try to relax by praying	1.09	1.48
Exposed to open air	.54	1.01
Change eating habit	.41	.98
Planned decrease in activity	.34	.86
Used assistive devices	.34	.87
Used oxygen therapy	.24	.66
Practice breathing exercise	.21	.76
others intervention (traditional healer/Kabiraj)	.09	.45

1 = Rarely, 2 = Occasionally, 3 = Frequently, 4 = Almost constantly

Discussion

The majorities of the patients were adult male, Muslims, diagnosed with COPD within 5 years, and had history of smoking. It is possible that smoking habit increase among male in Bangladesh (WHO, 2009). This finding indicated that people with older age and smoking were likely to be diagnosed with COPD more than younger people. Similar to another study which reported smokers were at two or three times higher risk of developing dyspnea in their life time compared to non-smokers. It is possible that smoking can damage sensory nerve and increase the risk of dyspnea (Rosi & Scano, 2004). Besides smoking, aging also affects on the lung volume. As people are older, their lung functions start to decline (Mannino & Buist, 2007).

The study found that most of the patients had a monthly income around 3000 to 5000 Taka per month which was considered poor, compared to the average per capita income of

11,480 taka (Government of the People's Republic of Bangladesh, 2011). It was possible that most patients in this study were coming from urban area. Most people living in urban area, graduated from primary school, worked in industries, having low income, were likely to smoke and develop COPD more than people in other areas (Ilias, et al., 2009). These findings are similar to another study conducted in China which reported people with low income and have lower educational level were risk for developing COPD (Yin, Zhang, Jiang, & Zhao, 2007). The majority of patients paid their treatment cost by themselves. This finding is congruent with the Health Bulletin report of the Bangladesh government which indicated 42% of health facilities paid by government and 64% paid by the private sector (Government of the People's Republic of Bangladesh, 2011).

Patients in this study reported dyspnea difficulty within the past 24 hours and within the past 7 days at moderate level. Nearly 56% of the patients have dyspnea more than 4 times within the past 24 hours and 78% of the patients have dyspnea every day within the past 7 days. These findings were similar to a previous study which assessed COPD patients in USA and reported dyspnea experience at moderate level over the past 24 hours (Christenbery, 2005). Although patients in the present study have dyspnea difficulty at moderate level, it affected much on their families and their quality of life. These patients could not work which results in losing income and requiring support from their family members. COPD also affect on the work productivity and force people to premature retirement (Fletcher et al., 2011).

The top three interventions the patients used to relieve dyspnea and perceived them as the most effective interventions included inhaled bronchodilators, the leaning forward position, and keeping still. The reason that the patients in this study used bronchodilators as the most effective intervention might be due to COPD patients in Bangladesh perceived bronchodilators as an effective and safe drug, easy to administer, and less side effect in long term use (Ilias et al., 2009). This finding was similar to another study conducted in Israel

which reported bronchodilators therapy, exercise, and inspiratory muscle training could decrease the perception of dyspnea (Wiener, Magadle, Berar- Yanay, Davidovich, & Wiener, 2000).

Most patients in this study used leaning forward position to manage dyspnea. It was possible that leaning forward position helps abdominal wall to move upwards with less transdiaphragmatic pressure, which provided more space for lung expansion and gas exchange (Jantarakupt & Porock, 2005). Most patients in this study also used keeping still to manage dyspnea. It was possible that keeping still could helped the patients to balance when doing activity and allow the patients to used oxygen less, which helps the patients to relieve dyspnea (Christenbery, 2005).

The least used methods reported by patients in this study included oxygen therapy, practice breathing exercise, and other methods (traditional healer/ kabiraj). The findings of this study were similar to the study of Christenbery, 2005, which reported top 3 dyspnea management interventions used by the patients in his study including moved slower, kept still, and oxygen. The reason why the patients in the present study used oxygen less might be associated with poor socioeconomic status.

Unlike study of Christenbery (2005) which reported 59.5% of the patients used breathing exercises to manage dyspnea, patients in the present study used breathing exercises only 7.9%. This reason for this difference finding might cause by lack of knowledge about performing breathing exercises. As Bangladesh facing with shortage of health care staff (Alam et al., 2013), no available pulmonary rehabilitation center, especially for the patients with COPD, these factors result in the patients had limited skills to perform breathing exercise effectively.

Conclusion

All COPD patients have dyspnea, so dyspnea management interventions are very important in helping patients to reduce dyspnea. Promoting the use of dyspnea management interventions which the patients can practice by themselves with no cost is more applicable in this country. This study provides new knowledge regarding dyspnea experience and dyspnea management used by COPD patients in Bangladesh, which may be useful for nurses and other healthcare professionals working in this area.

This study collected data from 140 COPD patients at the OPD of the NIDCH, Mohakhali, Dhaka, Bangladesh. The findings of this study may be limited in terms of generalization. It might not represent COPD patients around Bangladesh.

Nurses and other health care providers working in this area should consider promoting the use of effective dypsnea management interventions which COPD patients can practice by themselves with no cost, such as breathing exercise.

References

Alam, D., Hossain, M. D., Robinson, H., Hasan, M., & Kanungo, A. (2013). Health system preparedness for responding to the growing burden of non-communicable disease- A case study of Bangladesh. Retrieved from: *ni.unimelb.edu.au/-data/assets/pdf_file/0009/797508/WP_30.pdf*

Alam, D. S., Chowdhury, M. A .H., Siddiquee, A. T., Pervin, S., Ahmed, S., & Niessen, L. W. (2013). Prevalence of COPD and its socioeconomic and lifestyle determinants in Bangladesh: Preliminary results from a population based study. Retrieved from: https://www.theipcrg.org/.../Parallel+session+2a+Dewan+Alam.pdf

American Thoracic Society. (1999). Dyspnea mechanisms, assessment, and management: A consensus statement. *American Journal of Respiratory Critical Care Medicine*, 159, 321-340.

Christenbery, T. L. (2005). Dyspnea self-management strategies: Use and effectiveness as reported by patients with chronic obstructive pulmonary disease. *Heart Lung*, 34, 406-414.

Dodd, M., Janson, S., Facione, N., Faucett J., Froelicher, E. S., Rankin, S., & Taylor, D. (2001). Advancing the science of symptom management. *Journal of Advanced Nursing*, 33, 668-676.

Fletcher, J. M., Upton, J., Taylor-Fishwick, J., Buist, A. S., Jenkins, C., Hutton, J., … Walker, S. (2011). COPD uncovered: An international survey on the impact of chronic obstructive pulmonary disease [COPD] on a working age population. *BioMed Central Public Health*, 11, 1-13.

Global Initiative for Chronic Obstructive Lung Disease [GOLD] (2013). Global strategy for diagnosis, management, and prevention of chronic obstructive pulmonary disease. Retrieved from: http://www.goldcopd.org/uploads/users/files/GOLD_Report_2013_Feb20.pdf

Government of the People's Republic of Bangladesh. (2011). Ministry of health and family welfare. Management information system, directorate of general health services (DGHS). *Health Bulletin.* Dhaka, Bangladesh.

Ilias, M., Ahmed, S., Khan, M. S. R., Hiron, M. M., Rouf, M. A., Hossain, M. D., … Begum, T. (2009). Role of salmeterol in the treatment of COPD patients receiving ipratropium bromide. *Chest & Heart Journal, 33,* 1-10.

Jantarakupt, P., & Porock, D. (2005). Dyspnea management in lung cancer: Applying the evidence from chronic obstructive pulmonary disease. *Oncology nursing Forum* 2005, 32, 785- 796.

Mannino, D. M., & Buist, A. S. (2007).Global burden of COPD: Risk factors, prevalence, and future trends. *Lancet, 370,* 765–73.

Pauwels, R. A., Buist, A. S., Calverley, P. M.A., Jenkins, C. R., & Hurd, S.S. (2001). Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. NHLBI/WHO Global Initiative for Chronic Obstructive Lung Disease (GOLD) Workshop summary. *American Journal of Respiratory Critical Care Medicine, 163,* 1256-1276.

Rosi, E., & Scano, G. (2004). Cigarette smoking and dyspnea perception. *Tobacco Induced Diseases,* 2, 35-42.

Spector, N., Connolly, M. A., & Carlson, K. K. (2007). Dyspnea: Applying research to bedside practice. *American Association of Critical Care Nurse, 18,* 45 - 60.

Weiner, P., Magadle, R., Berar-Yanay, N., Davidovich, A., & Weiner, M. (2000). The cumulative effect of long-acting bronchodilators, exercise, and inspiratory muscle training on the perception of dyspnea in patients with advanced COPD. *Chest, 118,* 672–678.

World Health Organization [WHO] (2008).*Global Alliance Against Chronic Respiratory Diseases [GARD]:* General meeting report, Istanbul Turkey. Retrieved from http://www.whiar.org/docs/ Istanbul report final.

World Health Organization [WHO] (2009).*Global Adult Tobacco Survey (GATS): Bangladesh Report.* Retrieved from www.who.int/tobacco/.../global_adult_tobacco_survey_bangladesh_report

Weiner P, Magadle R, Berar-Yanay N, Davidovich A, & Weiner M. 2000. The cumulative effect of long-acting bronchodilators, exercise, and inspiratory muscle training on the perception of dyspnea in patients with advanced COPD. *Chest,* 118, 672- 678.

Yin, P., Zhang, M., Li, Y., Jiang, Y., & Zhao, W. (2011). Prevalence of COPD and its association with socioeconomic status in china: findings from china chronic disease risk factor surveillance 2007. *BioMed Central Public Health,* 11-586.