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Original Article

Assessment of Dyspnea in Patients with Chronic Obstructive Lung Diseases with Modified Borg Scale; A Descriptive Cross-Sectional Study

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ABSTRACT

Background: Chronic obstructive lung disease has been defined as the limitation of the bronchial airway that is not frequently fully recovered. It includes emphysema, chronic bronchitis and sometimes asthma. Because of the obstruction in the airway, the patient comes with the presenting complaints of dyspnea, cough, sputum weight loss and cyanosis with variation in the diameter of the wall of the chest. **Objective:** To subjectively rate dyspnea in patients with chronic obstructive lung disease considering the adult population. **Methods:** Our current study is a descriptive cross-sectional study. Data for the study was collected from Ghurki Trust Teaching Hospital and Sheikh Zayed Hospital, Lahore, Pakistan. The sampling technique employed is the non-probability sampling technique. The sample size for this study was calculated to be 89 by employing World Health Organization software. Older adult males and females with chronic obstructive lung diseases with presenting complaints of dyspnea were recruited in our study. A modified Borg scale was employed to assess the severity of dyspnea among these patients. The patients were scored for their severity from 0.5 to 10 which is followed by no breathlessness to maximal breathlessness. Written consent forms in Urdu and English were given to all the participants before the conduct of the study. The variables of this study were represented in the form of descriptive statistics, tables, graphs and percentages. **Results:** Most of the patients with chronic obstructive lung diseases reported suffering from very severe dyspnea. Results showed that 32.6% of patients reported suffering from dyspnea of very severe intensity followed by slight and moderate intensity. **Conclusion:** Our current study concludes that patients with lung diseases are found to suffer from severe dyspnea and this is one of their major complaints. The modified Borg Scale was found to be very easy to comprehend and was easily implemented in the clinical setups. It gives us a more accurate and reliable rating for the severity of dyspnea in these diseases.

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INTRODUCTION

Chronic Obstructive pulmonary disease has been observed to increase from the 11th position in 2007 to the 7th position in 2017 in the list of the topmost causes of years of fatal diseases among non-communicable diseases.[1] The distress and discomfort which is associated with dyspnea have been observed to affect the quality of life and the health status of the patient.[2] Dyspnea has been observed to have a moderate to strong relationship with the impairment of the health-related quality of life in patients with chronic obstructive lung disease and the complications and the severity of the dyspnea might also affect the rehabilitation outcomes.[3] As the intensity of the exercise training has been observed to be limited by dyspnea and abnormal ventilation, improved and better training results might potentially be achieved if the intensity of the dyspnea gets diminished. Although the capacity of the exercise and the quality of life of the patients with chronic obstructive lung disease have improved drastically by employing the rehabilitation techniques, still no breakthrough progress has occurred in improving the breathing difficulties and the mechanism of training to relieve dyspnea has not been elaborated.[4]

Our current study will focus on assessing dyspnea in Pakistani patients with chronic obstructive lung diseases which would aid the healthcare providers in creating awareness regarding dyspnea among the patients and the normal people and more work could be done on its preventive and precautionary measures. Dyspnea has been defined as the subjective experience of breathing discomfort that includes qualitatively discrete sensations.[5] It is a very common and complex symptom which has been observed to occur frequently and is being frequently assessed in clinical practice. Assessing dyspnea is relevant to the patients who are admitted to the emergency room or the hospital.[6] Because of the high prevailing rate of dyspnea in various respiratory diseases, such as lung cancer, chronic obstructive pulmonary disease, interstitial lung disease and it has been considered a substantial patient-reported outcome in clinical and research settings.[7] The factors contributing to dyspnea and its mechanisms have been investigated for a very long time. Nonetheless, the neurophysiology and psychology of dyspnea have been observed to increase considerably in the last epoch. Various cultural and psychological factors might also play a significant role in the perception of shortness of breath.[8]

Consequently, the assessment of dyspnea has been observed to improve notably while taking into account various domains.[9] But, despite various new tools for assessing dyspnea, those tools which specifically evaluate the sensory and affective domains, which have recently emerged, the visual analogue scale[10] and modified Borg scale[11] are largely being used.[12] Both of these tools have already been shown to be sensitive enough to measure dyspnea.[11] Although even if they have similar scoring scales and the tools are almost conceptually similar, the level of association between these two measures has not been studied.[13] The perception of dyspnea has always been subjective, therefore, the patient's self-assessment of dyspnea is the most preferred assessment method[14], still, the assessment by the caregiver is sometimes definitely required. This mostly occurs when the patient is performing an exercise for those who are not able to communicate their feelings and discomforts subjectively. 54% of the patients who were referred for inpatient palliative care consultation are not able to assess their level of dyspnea.[15]

To facilitate the assessment of dyspnea in these patients, the respiratory distress

observation scale has been known to be validated in terminally ill patients.[16] However, there is a lack of particular tools for non-communicative patients such as those in a coma or diagnosed with cerebral palsy.[17] Pain has always been known as a subjective symptom which might share some similarities with dyspnea. Indeed, dyspnea and pain are both associated with chronic diseases, decline in quality of life, obnoxiousness and physical sensations medicated by a communal cortical network. The assessment of patients and physicians of the intensity of pain has shown poor agreement.

The same results were found with measurements of other symptoms, particularly those which are considered more subjective.[18] Nonetheless, the agreement between the patient and caregiver for assessing the intensity of dyspnea has been poorly researched. Our current study might fill this gap. The duration of the dyspnea and its variability over time might also influence this agreement and these domains are partly related to the types of respiratory diseases. Furthermore, the feelings of emotional distress could contrarily influence this agreement either by the caregiver or by the patients depending on the disease and its prognosis. For assessing dyspnea, our current study employed the modified Borg scale. Our current study focuses on the entire idea of measuring dyspnea. It is important to document the level of dyspnea by employing the modified Borg scale provides us with a baseline on which the basis of the prognosis of the patient could be made and helps the healthcare provider to direct the treatment according to the patient's needs. Studies like ours are needed in Pakistan to create more awareness among people to work on and focus on precautionary and preventive measures. Our current study would add significant knowledge to the literature for assessing dyspnea in Pakistani chronic obstructive lung disease patients.

METHODS

Our current study is a descriptive cross-sectional study and was completed six months after its approval. The data for our current study was collected from Ghurki Teaching Hospital and Sheikh Zayed Hospital, Lahore, Pakistan after approval from its ethical committee allowing us to collect data following the ethical rules stated by the Hospital administration. For collecting the sample, the non-probability convenient sampling technique was employed. The sample size for this current study was calculated by employing World Health Organization (WHO) software utilizing the following formula considering 9.1% prevalence (P), 95% confidence interval (1-α) and 0.06 precision (d).[19]

(Z^2 1-ακ P(1-P))/d^2

The sample size came out to be 89. Patients suffering from chronic obstructive lung diseases, adult patients both males and females and patients with dyspnea due to Chronic obstructive lung disease were recruited in our study.[20] The patients who were not cooperating, patients who had any active infection, patients who had acute exacerbation and patients who had dyspnea due to any other pulmonary conditions were not included in this study.[20] Data for our current study was collected from all the patients suffering from chronic obstructive lung disease who came to the Outdoor patient department. Patients who fulfilled our inclusion criteria were then screened. Patients were assessed by employing the modified Borg scale. This scale inquires the patient to rate his or her difficulty in breathing, The scale starts at the number 0 where their breathing is causing no difficulty at all and progresses to a score of 10 where their breathing difficulty reaches maximum.[21,22] Written consent forms in Urdu and English were given to all the participants before the

conduct of the study. The questionnaire and the consent form employed were accompanied by a sheet consisting of information that explained the nature and the purpose of the study. The patient is subjectively inquired about the severity of the dyspnea (shortness of breathlessness). The participants were assured that their responses would remain confidential. The patients were scored for their severity from 0.5 to 10 which is followed by no breathlessness to maximal breathlessness. Data was entered by employing Statistical Package for Social Sciences version 23 and the same software was employed for the analysis of the data. The variables of the study were represented in the form of descriptive statistics in the form of tables, graphs and percentages.

RESULTS

In this study about 66 male and 23 female patients were recruited in this study. The frequency of variation in the severity of dyspnea. Most of the patients suffering from chronic obstructive lung diseases were reported to have very severe intensity dyspnea as the results showed 32.6% of people experienced very severe dyspnea followed by slight and moderate. Table II shows us the comparison of how occupation correlates with dyspnea thus the results of our study conclude that the labour community having chronic obstructive lung disease experiences very severe dyspnea which is followed by factory workers along with farmers. Table III represents the frequency of occupation of diseased subjects and shows that a community of businessmen experiencing chronic obstructive lung diseases frequently presents with dyspnea along with office workers and farmers. Results showed that 34.8% of females experience very severe dyspnea while 31.8% of males experience very severe dyspnea.

Table I: Descriptive Statistics of Gender

Level of Severity	Frequency	Percentage
Very very slight	5	5.6%
Very slight	4	4.5%
Slight	14	15.7%
Moderate	13	14.6%
Somewhat severe	9	10.1%
Severe	12	13.5%
Very severe	29	32.6%
Very very severe	3	3.4%
Total	**89**	**100.0**

DISCUSSION

The results of our current study show us that the patients suffering from Chronic obstructive lung diseases were found to suffer from dyspnea and most of them were presented with severe dyspnea. A modified Borg Scale was employed to document their severity. The modified Borg Scale is very easy to comprehend and was easily implemented in the clinical setups. It gave us accurate ratings and reliable results. Andrew L Ries and co-workers conducted a study to determine the

Table II: Frequency of Occupation with Diseased Subjects

Occupation	Frequency	Percentage
Factory workers	10	11.2%
Office workers	14	15.7%
Labour	6	6.7%
Businessman	19	21.3%
Farmer	9	10.1%
Others	31	34.8%
Total	**89**	**100.0%**

Table III: Cross-tabulation of Occupation with Dyspnea

Occupation	Very very slight	Very slight	Slight	Moderate	Somewhat severe	Severe	Very severe	Very very severe	Total
Factory workers	1	0	2	3	0	0	4	0	10
	10%	0%	20.0%	30.0%	0%	0%	40.0%	0%	100%
Office workers	1	1	2	2	3	2	2	1	14
	7.1%	7.1%	14.3%	14.3%	21.4%	14.3%	14.3%	7.1%	100%
Labour	0	0	1	0	0	1	3	1	6
	0%	0%	16.7%	0%	0%	16.7%	50.0%	16.7%	100%
Businessman	2	0	5	4	0	3	5	0	19
	10.5%	0%	26.3%	21.1%	0%	15.8%	26.3%	0%	100%
Farmer	0	1	1	1	1	1	3	1	9
	0%	11.1%	11.1%	11.1%	11.1%	11.1%	33.3%	11.1%	100%
Others	1	2	3	3	5	5	12	0	31
	3.2%	6.5%	9.7%	9.7%	16.1%	16.1%	38.7%	0%	100%
Total	5	4	14	13	9	12	29	3	89
	5.6%	4.5%	15.7%	14.6%	10.1%	13.5%	32.6%	3.4%	100%

impact of chronic obstructive pulmonary diseases on quality of life and the role of dyspnea in their lives. Their article describes several very well-validated questionnaires and scales for assessing dyspnea that might be effective for assessing the intensity and impact that dyspnea might have placed on a patient's health-related quality of life. Additionally, they also described the incorporation of pulmonary rehabilitation and specifically pharmacotherapies as well as how these interventions might positively influence and modify the distress and severity of dyspnea. They concluded that an effective assessment and therapeutic management of dyspnea for patients suffering from chronic obstructive lung diseases are very good opportunities for improving patients' overall health-related quality of life.[20] Our current study completely agrees with their conclusion.

Syed Hafeez ul Hassan and co-workers conducted a study to determine the usefulness of a modified Borg scale for dyspnea in chronic obstructive pulmonary diseases and asthma in a rural population of Karachi, Pakistan. Their objective was to assess the modified Borg scale for the subjective rating of dyspnea of patients with chronic obstructive lung diseases and asthma. Their results concluded that the modified Borg scale is a valid and reliable tool for the perception of dyspnea and can be used for assessing patients with shortness of breath subjectively.[23] Our current study employed this tool and agrees with the conclusion that this tool is reliable. Duygu Ilgin and co-workers conducted a study to check and

determine the effects of gender on the use of modified Borg and visual analogue scales for evaluating dyspnea in chronic obstructive pulmonary diseases. The results of their study showed that gender affects the perception of dyspnea. Our study agrees with this because in our results we also observe that women tend to report higher levels of severity of dyspnea as compared to men. They suggested that the modified Borg scale and visual analogue scale must be employed for men while the modified Borg scale might be more convenient for females for evaluating dyspnea in severe chronic obstructive lung diseases.[24] Our study recommends that Pakistani researchers conduct a study focusing on which tool should be employed for men and which for men. The scale employed in our study was the modified Borg scale. It is a scale that rates the symptom subjectively but the patient should have been examined by the sound of their lungs produced due to dyspnea. The Patients must have been encouraged to talk about the severity of dyspnea which might have justified the score they have reported on the scale.

This current study recommends that patients must also be objectively evaluated along with subjective ratings by employing this scale. Patients were observed that they were exaggerating their severity when inquired about their condition. Some patients were observed to have been suffering from severe dyspnea and they were not able to rate their severity, so we needed to examine the sound of their lungs with the use of a stethoscope. Our current study recommends future researchers to conduct future studies focusing on the missing points in our study. Our study also recommends the examiners conduct long history sessions with the patients to justify their rating of the scale employed. Rural areas must also have been targeted. Work could also have been done on a larger sample size for more generalizable results, especially in developed countries like Pakistan. Our current study recommends future researchers conduct studies focusing on determining the risk factors associated with dyspnea and studies focusing more on the association between the occupation and the occurrence of dyspnea. More studies are required focusing on determining the risk factors and determining the possible precautionary and preventive measures for dyspnea in Chronic obstructive lung disease patients.

CONCLUSION

The current study concludes that patients with chronic obstructive lung diseases are found to suffer from severe dyspnea and this is one of their major complaints. A modified Borg scale was employed to assess the severity of dyspnea in these patients. The modified Borg scale was found to be very easy to comprehend and was easily implemented in the clinical setups. It gave us a more accurate and reliable rating for the severity of dyspnea in patients with chronic obstructive lung diseases.

DECLARATIONS

Consent to participate: Written consent had been taken from patients. All methods were performed following the relevant guidelines and regulations.

Availability of data and materials: Data will be available on request. The corresponding author will submit all dataset files.

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Authors' contributions: All authors read and approved the final manuscript.

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