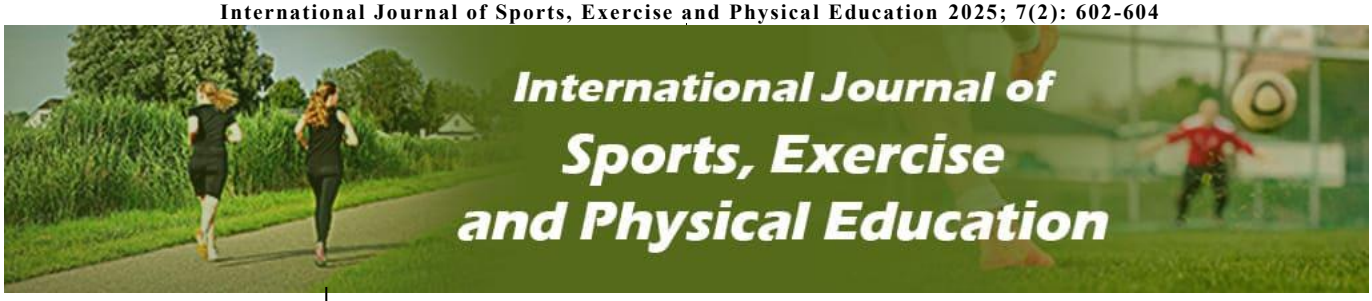

ISSN Print: 2664-7281
ISSN Online: 2664-729X
Impact Factor: RJIF 8.15
IJSEPE 2025; 7(2): 602-604
https://www.sportsjournals.net
Received: 15-10-2025
Accepted: 18-11-2025

Pranesh A
Department of Physiotherapy, College of Physiotherapy, Sri Ramakrishna Institute of Paramedical Science, Coimbatore, Tamil Nadu, India

R Amutha
Department of Physiotherapy (Cardio-Respiratory), College of Physiotherapy, Sri Ramakrishna Institute of Paramedical Science, Coimbatore, Tamil Nadu, India

Corresponding Author:
Pranesh A
Department of Physiotherapy, College of Physiotherapy, Sri Ramakrishna Institute of Paramedical Science, Coimbatore, Tamil Nadu, India

Evaluating the correlation of dyspnea in modified medical research scale & baseline dyspnea index using six minute walk test among COPD subjects

Pranesh A and R Amutha

DOI: https://www.doi.org/10.33545/26647281.2025.v7.i2h.281

Abstract
The study aimed to evaluate the correlation of dyspnea using the Modified Medical Research Council (MMRC) scale and the Baseline Dyspnea Index (BDI) through the Six-Minute Walk Test (6MWT) among COPD patients. Twenty male subjects aged 35–55 years with moderate to severe COPD were included. Participants underwent pre- and post-assessments following two weeks of Buteyko breathing exercises. Statistical analysis showed significant improvement in dyspnea levels on both MMRC and BDI scales. However, a weak correlation was observed between MMRC and BDI, indicating they measure different aspects of dyspnea. The study concludes that both scales are effective but not interchangeable for evaluating dyspnea in COPD patients.

Keywords: COPD, Dyspnea, MMRC Scale, BDI Scale, Six-Minute Walk Test, Buteyko Breathing Technique

Introduction
Chronic Obstructive Pulmonary Disease (COPD) is a progressive respiratory disorder characterized by persistent airflow limitation and chronic inflammation of the airways, leading to symptoms such as dyspnea, cough, and fatigue. It is one of the leading causes of morbidity and mortality worldwide, primarily associated with smoking and environmental exposure. Assessing dyspnea accurately is essential for evaluating disease severity and functional capacity in COPD patients. The Modified Medical Research Council (MMRC) Scale and Baseline Dyspnea Index (BDI) are widely used tools to quantify breathlessness and its impact on daily activities. The Six-Minute Walk Test (6MWT) provides an objective measure of functional performance. This study aimed to evaluate the correlation between MMRC and BDI scores using the 6MWT among COPD subjects and to determine the effect of Buteyko breathing exercises on dyspnea and functional capacity.

Materials Required
MMRC (Modified Medical Research Council) Scale
BDI (Baseline Dyspnea Index) Scale
Stethoscope
Sphygmomanometer
Pulse Oximeter
Stopwatch
Cones/Markers
Chairs
Measuring Tape
Data Recording Sheet

Study Setting
Sri Ramakrishna Multi specialty Hospital

Study Design
Quasi-experimental study

Sample Size
34 subjects (14 patients were excluded for various reasons and remaining 20 were assigned in group).

Sampling Method
Purposive sampling

Study Duration
6 months

Treatment Duration
20 minutes

Selection Criteria
Inclusion Criteria
Age group: 35–55 years
Male ambulatory COPD patients
Smokers with a confirmed diagnosis of COPD
Patients diagnosed with moderate or severe COPD (Stage II & III as per GOLD classification)
Hemodynamically stable individuals
Subjects willing to participate

Exclusion Criteria
- Patients diagnosed with mild COPD (Stage I – GOLD classification)
- Female COPD patients
- Non-smokers
- Patients with acute exacerbation of COPD
- Presence of other respiratory disorders (e.g., asthma, bronchiectasis)
- Ischemic heart disease or other cardiac conditions
- Neuromuscular or musculoskeletal disorders affecting mobility
- Patients on long-term oxygen therapy
- Unstable vital signs or recent hospitalization
- Peripheral vascular disease

Outcome Measures
- **Modified Medical Research Council (MMRC) Scale** – to assess the degree of breathlessness and its impact on daily activities.
- **Baseline Dyspnea Index (BDI)** – to measure functional impairment, magnitude of task, and effort related to dyspnea.
- **Six-Minute Walk Test (6MWT)** – to evaluate functional capacity and endurance by measuring the distance covered in six minutes.

Measurement Tool
- **Modified Medical Research Council (MMRC) Scale** – to quantify the severity of dyspnea based on activity limitation.
- **Baseline Dyspnea Index (BDI)** – to evaluate dyspnea through three components: functional impairment, magnitude of task, and magnitude of effort.
- **Six-Minute Walk Test (6MWT)** – to measure the functional exercise capacity and endurance of COPD patients.

Procedure: The subjects were selected randomly and assigned into a group. The study population includes only those met with the inclusion criteria.

34 subjects were selected for the study, Out of 14 subjects were excluded for various reasons, remaining 20 were assigned for the study.
The patients were assessed with modified medical research scale , baseline dyspnea index scale for dyspnea using six minute walk test.
Pre-test evaluation was done on the first day, then the patient was trained with buteyko breathing method for two weeks , after two weeks , post test evaluation was done.

Treatment Techniques
Buteyko breathing exercise
The buteyko method is primarily a system of breathing training that teaches patients to control their tendencies to over breathe or hyperventilate. It is based on the the theories of late Ukranian physician dr. Konstantin Buteyko who believed that carbon dioxide deficiency was a major cause of many chronic diseases , he claimed that the buteyko method which aims to raise carbon dioxide could be beneficial in treating many diseases.
The buteyko method made its way to Australia , Europe and the United States in the 1990's . In these countries the buteyko method became the best known treatment for asthma and was considered to be helpful for individuals with chronic obstructive pulmonary disease.

Result
Post-test MMRC scores showed mostly minimal improvement, while BDI scores showed varied levels of improvement among subjects. Correlation analysis indicated a positive relationship before the intervention and a weaker, negative relationship after, suggesting that the two scales assess dyspnea differently in COPD patients.

Comparison Of Values

Values	Scales	Mean difference	"ρ" spearman ' s value
Pre-Test	MMRC & BDI	45	0.74
Post-test	MMRC & BDI	103	-0.38

Discussion
This study evaluated the correlation between MMRC and BDI scales among COPD patients. Literature suggests that MMRC and BDI assess dyspnea differently, with BDI showing larger individual variations. In our study, post-test MMRC scores showed mostly minimal improvement, while BDI scores showed varied improvement across subjects. Spearman's correlation indicated a moderate positive correlation pre-test ($p = 0.73$) and a weak negative correlation post-test ($p = -0.38$), suggesting that the two scales measure dyspnea differently. Thus, MMRC and BDI provide complementary information for assessing dyspnea intensity in COPD patients.

Conclusion
Based on the statistical analysis, On experimenting the pre-test and post-test values, the Modified medical research council scale and Baseline dyspnea index had a weaker co-relationship between them. Hence, accepting the Null hypothesis and rejecting the alternate hypothesis.
Thus, we conclude that there is no significant correlation between the MMRC and BDI dyspnea scales.

References

1. Chaitow L, Bradley D, Gilbert C. Recognizing and treating breathing disorders. 2nd ed. Chapter 8.2: Buteyko breathing method.
2. World Health Organisation (WHO). Chronic obstructive pulmonary disease.
3. Reddy KS, Shah B, Varghese C, Ramadoss A. Responding to the threat of chronic diseases in India. Lancet. 2005;366:1746–51.
4. Salvi S, Agarwal A. India needs a national COPD prevention and control program. J Assoc Physicians India. 2012;60(Suppl):5–7.
5. Koul PA. Chronic obstructive pulmonary disease: Indian guideline and the road ahead. Lung India. 2013 Sep;30(3):175–7.
6. Brody JS, Spira A. Chronic obstructive pulmonary disease, inflammation and lung cancer. Am Thorac Soc. 2006:535–8.
7. Saetta M. Airway inflammation in COPD. Am J Respir Crit Care Med. 1999;160:S17–20.
8. Saetta M, Stefano A, Maestrelli P, Ferrarresso A, Drigo R, Poteno A, Ciaccia A, Fabbri LM. Activated T lymphocytes and macrophages in bronchial mucosa of subjects with chronic bronchitis. Am Rev Respir Dis. 1993;147:301–6.
9. Laniado R. Smoking and chronic obstructive pulmonary disease (COPD): Parallel epidemics of the 21st century. 2009 Jan;6910:209–24.
10. Enright PL. The six-minute walk test. Respir Care. 2003 Aug;48(8):783–5.
11. Holland AE, Spruit MA, Troosters T, Puhan MA, Pepin V, Carlin BW, Pitta F, *et al*. Field walking tests in chronic respiratory disease. Eur Respir J. 2014 Dec;44(6):1428–46.
12. Han MK, Muellerova H, Curran-Everett D, Dransfield MT, Wasko GR, Regan EA, *et al*. GOLD 2011 disease severity classification in COPDGene. Lancet Respir Med. 2013;1(1):43–50.
13. Matos Casano HA, Anjum F. Six-minute walk test. StatPearls Publishing; June 19, 2022.
14. Sharma R, Kumar N, Sharma N, Praveen S, Patra A. Study to compare the effect of Buteyko breathing technique and pursed-lip breathing in COPD. Physiotherapy and Occupational Therapy Journal. 2019 Jun;12(2).