

Multimodal Physiotherapy for Chronic Bronchitis with Prior Pulmonary Tuberculosis: A Case Report

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Abstract

Background: Chronic bronchitis is characterized by chronic cough and sputum production and is not synonymous with chronic obstructive pulmonary disease (COPD). Respiratory physiotherapy may address respiratory symptoms and secretion management.

Objective: To describe clinical findings and short-term changes after multimodal physiotherapy in an older adult with chronic bronchitis and prior treated pulmonary tuberculosis.

Methods: This single case report involved an 82-year-old man treated at Balai Besar Kesehatan Paru Masyarakat Makassar. The 2025 episode comprised 12 reported sessions from 24 November to 5 December and included pursed lip breathing, deep breathing, huffing, chest mobility exercise, microwave diathermy, and manual therapy. Paired pre and post data were available for Modified Borg score, peripheral oxygen saturation, and respiratory rate. Spirometry dated 21 July 2025 was treated as contemporaneous clinical information.

Results: Modified Borg score decreased from 0.5 to 0, resting SpO₂ increased from 98% to 100%, and respiratory rate changed from 20 to 22 breaths/min. Spirometry showed FVC 0.90 L (34.40% predicted), FEV₁ 0.83 L (42.84% predicted), and FEV₁/FVC 91.69%. The preserved ratio with reduced FVC indicated a possible restrictive or nonspecific pattern.

Conclusion: Small short-term changes in dyspnea score and resting SpO₂ were observed in this single case. The findings are descriptive and cannot establish treatment effectiveness, individual component effects, or generalizability.

Keywords

Chronic Bronchitis; Physical Therapy Modalities; Pulmonary Rehabilitation; Dyspnea; Case Reports

Introduction

Chronic bronchitis is a clinical syndrome characterized by chronic cough and sputum production for at least 3 months in each of 2 consecutive years after other causes of chronic productive cough have been considered. The syndrome may occur in patients with COPD, but chronic bronchitis alone does not establish a diagnosis of COPD. Contemporary definitions of COPD require evidence of persistent airflow obstruction, and spirometry is central to diagnostic confirmation.^{1,2}

Chronic respiratory symptoms, including cough, sputum production, and dyspnea, may interfere with daily activity and can be accompanied by altered breathing patterns and reduced exercise tolerance. Respiratory physiotherapy is incorporated into pulmonary rehabilitation and symptom management when clinically indicated, particularly when breathing pattern abnormalities, secretion retention, or musculoskeletal contributors are present.³

Breathing retraining and airway clearance techniques have been investigated predominantly in COPD and other chronic respiratory populations. Available evidence suggests that selected outcomes such as dyspnea, pulmonary function, or exercise capacity may change with breathing exercises, whereas the effects of airway clearance techniques are generally modest and context dependent.^{4,5} These findings support individualized intervention while requiring cautious interpretation when evidence is extrapolated to a single patient with a different clinical profile.

Pulmonary function interpretation in the present case also requires caution. A reduced forced vital capacity (FVC) with a preserved FEV₁/FVC ratio does not independently confirm restrictive ventilatory impairment. ERS and ATS guidance emphasizes that spirometry patterns should be interpreted within the clinical context and that lung volume measurement is required to confirm restriction.⁶

The clinical value of this case lies in the combination of chronic respiratory symptoms, prior treated pulmonary tuberculosis, reduced thoracic expansion, and upper trapezius musculoskeletal findings followed by a multimodal physiotherapy program. A previous manuscript incorrectly dated the spirometry as 27 May 2021. Author confirmation established that the correct examination date was 21 July 2025, whereas 2021 referred only to the patient's earlier history of care at the facility. This correction permits the spirometry to be presented as contemporaneous clinical information from the same year as the physiotherapy episode.

Accordingly, this case report aims to describe the clinical presentation, physiotherapy management, and short term changes in available clinical parameters during the 2025 treatment episode. The report does not aim to establish treatment efficacy or causal effects of individual treatment components.

Methods

This was a single case report prepared in accordance with the CARE guideline.⁷ The report describes one outpatient physiotherapy episode in an older adult with a medical diagnosis of chronic bronchitis. No control condition, randomization, or experimental comparison was used; therefore, the design supports descriptive reporting only.

The patient was an 82-year-old man, identified in the source record as Tn. S, a retired teacher receiving outpatient care at Balai Besar Kesehatan Paru Masyarakat Makassar. His height was 158 cm, body mass was 52 kg, and body mass index was 20.8 kg/m². He had pulmonary tuberculosis diagnosed in 1980 and reported completing 6 months of antituberculosis treatment, after which he was considered cured. He had also smoked actively from 1970 to 1980. Hypertension was recorded as a comorbidity, although its control status during the 2025 episode was not available in the reviewed documentation. Intervention selection was reported to consider the patient's clinical condition and safety.

The patient had a history of receiving care at the facility beginning in 2021. Spirometry relevant to this report was performed on 21 July 2025. The outpatient physiotherapy episode occurred from 24 November to 5 December 2025 and was reported to comprise 12 sessions. The source documentation did not provide the individual dates of all sessions, actual weekly frequency, or a reconstructable total session duration. Author confirmation established that all intervention components were delivered at every session and that the overall sequence did not change between sessions.

The available assessment included dyspnea, thoracic expansion, spirometry, upper trapezius tenderness and spasm, and the London Chest Activity of Daily Living (LCADL) questionnaire. The Modified Borg Scale was used as a 0 to 10 measure of perceived dyspnea.⁸ Thoracic expansion was measured with a tape measure at the axillary, nipple, and xiphoid levels, with 2 cm recorded at each level at baseline. Spirometry performed on 21 July 2025 showed FVC of 0.90 L, FEV₁ of 0.83 L, and FEV₁/FVC of 91.69%. An LCADL value of 20% was available from the clinical record and was reported by the authors as reflecting mild functional limitation. The raw total score, domain scores, exact administration date, and post intervention value were not available. Because the LCADL was originally developed and validated in severe COPD populations, interpretation outside that context should be cautious.^{9,10} Upper trapezius tenderness and spasm were assessed clinically without a standardized quantitative scale. Resting peripheral oxygen saturation and respiratory rate were available before and after intervention.

The multimodal program included pursed lip breathing, deep breathing exercise, huffing, chest mobility exercise, microwave diathermy (MWD), and manual therapy. All components were reported to have been delivered at each session. Pursed lip breathing and deep breathing were performed in a comfortable and stable position, including supine positioning when appropriate. The patient was instructed to perform slow, controlled inspiration and, during pursed lip breathing, slow expiration through narrowed lips. The recorded dose for breathing exercise was 8 counts for 2 repetitions.

Huffing was used as a forced expiratory technique to mobilize secretions, after which the patient was directed to expectorate when secretions reached the proximal airways. The recorded dose was 5 to 8 counts. Chest mobility exercise targeted the middle and lower thoracic regions. For the middle thoracic region, breathing was coordinated with bilateral arm movement and alternating right and left trunk rotation. For the lower thoracic region, the patient was positioned supine with both knees flexed and performed coordinated breathing with right and left trunk and lower limb rotation.

MWD was applied to the upper trapezius at 40 W for 10 minutes. Before application, the patient's general condition and treatment area were checked to identify contraindications or conditions that could compromise safety. Manual muscle release and hold relax stretching were applied to the upper trapezius for approximately 5 to 8 minutes, with hold relax stretching performed for 3 repetitions. Breathing exercises, huffing, and chest mobility exercise were each reported to last approximately 5 minutes. Provider qualifications, detailed MWD applicator positioning, and several technical procedural parameters were not available in the source documentation. The intervention description was organized according to the TIDieR reporting principles, while unavailable details were not reconstructed.¹¹

Baseline assessment was performed before the 2025 program, and post intervention assessment was conducted after the reported treatment period. No post intervention measurements were available for thoracic expansion, LCADL, or spirometry. Upper trapezius tenderness and spasm were evaluated clinically, but no quantitative pre and post values were documented. No objective sputum measurement was performed, and sputum elimination during treatment was recorded only as a clinical observation. No medium or long term follow up was available.

Analysis was descriptive. Available paired pre and post values from the same treatment episode were compared without inferential statistical testing. No *p* values, confidence intervals, or effect estimates were calculated because the source record did not provide data appropriate for such analyses.

Written consent for participation and publication of this case report was obtained directly from the patient and retained according to institutional procedures and policies. According to the applicable institutional policy, this single case report did not require formal ethical approval. No separate ethical approval, exemption, or waiver number was issued.

Results

At presentation for the 2025 physiotherapy episode, the patient reported productive cough with difficulty expectorating and dyspnea mainly during moderate to heavy activity, including stair climbing and walking uphill. Inspection described a barrel shaped chest and shoulder protraction. Palpation identified bilateral upper trapezius tenderness and spasm.

Spirometry performed on 21 July 2025 showed FVC of 0.90 L (34.40% predicted), FEV₁ of 0.83 L (42.84% predicted), and FEV₁/FVC of 91.69%. The preserved ratio did not support an obstructive spirometric pattern on the basis of the reported values. In the absence of total lung capacity measurement, the low FVC was described as a possible restrictive or nonspecific pattern rather than confirmed restriction.⁶

At the 2025 baseline assessment, thoracic expansion was 2 cm at the axillary, nipple, and xiphoid levels. LCADL was reported as 20%, although raw and domain scores were unavailable. No post intervention thoracic expansion or LCADL measurement was documented. The paired outcomes available from the source record are summarized in Table 1.

Table 1. Pre and post intervention values for outcomes with paired data available in the source record.

Outcome	Pre intervention	Post intervention	Descriptive change
Modified Borg dyspnea score	0.5	0	Decrease of 0.5 points
Resting peripheral oxygen saturation	98%	100%	Increase of 2 percentage points
Respiratory rate	20 breaths/min	22 breaths/min	Increase of 2 breaths/min

Clinical findings without paired post intervention measurements are summarized in Table 2.

Table 2. Clinical findings without paired post intervention measurements. LCADL, London Chest Activity of Daily Living; FVC, forced vital capacity; FEV₁, forced expiratory volume in 1 second.

Parameter	Available finding	Timing	Post intervention value
Thoracic expansion, axillary level	2 cm	2025 baseline	Not available
Thoracic expansion, nipple level	2 cm	2025 baseline	Not available
Thoracic expansion, xiphoid level	2 cm	2025 baseline	Not available
LCADL	20% as reported	2025 episode	Not available
Spirometry, FVC	0.90 L (34.40% predicted)	21 July 2025	Not available
Spirometry, FEV ₁	0.83 L (42.84% predicted)	21 July 2025	Not available
Spirometry, FEV ₁ /FVC	91.69%	21 July 2025	Not available
Upper trapezius tenderness and spasm	Present bilaterally	2025 baseline	Not quantified
Sputum	Difficulty expectorating reported	2025 presentation	Not quantitatively measured

Sputum elimination during airway clearance was documented as a clinical observation only. No quantitative assessment of sputum volume, frequency, color, or consistency was available. No clinical follow up after completion of the program on 5 December 2025 was documented.

Discussion

The principal finding was a decrease in Modified Borg dyspnea score from 0.5 to 0 and an increase in resting peripheral oxygen saturation from 98% to 100%, while respiratory rate changed from 20 to 22 breaths/min during the reported multimodal physiotherapy episode. These observations require cautious interpretation because the absolute changes were small, only one patient was described, and no comparator was available. The change in peripheral oxygen saturation cannot establish improved alveolar gas exchange because arterial blood gas analysis, diffusion testing, or another direct measure of gas transfer was not available.

The confirmed diagnosis during the 2025 episode was chronic bronchitis, and no medically established diagnosis of COPD was available in the clinical data. Chronic bronchitis should therefore not be presented as synonymous with COPD.^{1,2} Spirometry obtained on 21 July 2025 showed reduced FVC with a preserved FEV₁/FVC ratio. This pattern does not support airflow obstruction on the basis of the reported ratio and should be interpreted as possible restriction or a nonspecific pattern because total lung capacity was not measured.⁶

The observed change in perceived dyspnea followed a program combining breathing retraining, airway clearance, thoracic mobility exercise, MWD, and manual therapy. Breathing exercises have been investigated in COPD populations and may influence dyspnea or selected pulmonary and exercise outcomes, while airway clearance techniques may provide modest benefits in selected patients with secretion related problems.^{4,5} These findings provide a rationale for individualized management but do not establish that any component caused the observed changes in this patient.

Sputum elimination should be interpreted as a clinical observation because no objective sputum quantity or standardized characterization was recorded. Similarly, upper trapezius tenderness and spasm were identified clinically at baseline, but no quantitative post intervention measure was available. Changes in these findings therefore cannot be quantified or attributed to MWD, manual therapy, or another individual component. The same limitation applies to thoracic expansion and LCADL because no paired post intervention values were documented.

An important strength of this revision is the correction of the spirometry date. The 21 July 2025 examination is now clearly separated from the patient's earlier history of care beginning in 2021, resolving the erroneous presentation of the spirometry as a 2021 historical finding. The report also provides a more complete intervention description and explicitly distinguishes measured outcomes from observations and unavailable outcomes. Important limitations remain. The individual dates of all 12 sessions, actual weekly frequency, and reconstructable total session duration were not available. Provider qualifications and some technical intervention parameters were also unavailable. In addition, several clinically relevant outcomes lacked post intervention measurements, and no medium or long term follow up was documented. These limitations restrict reproducibility, causal attribution, and interpretation of durability.

Future reports should prospectively document treatment schedules, provider characteristics, intervention procedures, safety parameters, contemporaneous outcome measurements, and follow up.¹¹ When a restrictive ventilatory disorder is suspected, lung volume measurement should be considered when clinically indicated to distinguish confirmed restriction from a nonspecific spirometric pattern.⁶ Comparative studies with predefined outcomes would be required before the effectiveness of this multimodal program can be evaluated.

Conclusion

In this single case, a multimodal physiotherapy program was followed by a decrease in Modified Borg dyspnea score from 0.5 to 0 and an increase in resting peripheral oxygen saturation from 98% to 100%, while respiratory rate changed from 20 to 22 breaths/min. These observations describe short term changes during one treatment episode and should not be interpreted as proof of treatment effectiveness. Spirometry performed on 21 July 2025 showed reduced FVC with a preserved FEV₁/FVC ratio, consistent with a possible restrictive or nonspecific pattern rather than confirmed restriction or documented airflow obstruction. Because several intervention components were delivered together and several outcomes lacked post intervention measurements, the contribution of individual techniques and the durability of the observed changes remain uncertain. The case supports careful individualized respiratory physiotherapy and highlights the importance of complete intervention reporting, contemporaneous outcome measurement, and follow up in future case reports and comparative studies.

Patient Perspective

A direct patient statement regarding treatment goals, experience of the intervention, or perceived change was not available in the source documentation.

Author Contribution

Shaskirana Humairah: Conceptualization, Formal Analysis, Investigation, Resources, Data Curation, Writing Original Draft, Visualization.

Salki Sadmita: Conceptualization, Methodology, Validation, Writing Review and Editing, Supervision.

Alfi Syahar M: Conceptualization, Validation, Writing Review and Editing, Supervision.

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Conflict of Interest Statement

The authors declare that they have no competing interests or conflicts of interest related to the publication of this case report.

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Ethics Statement

Written informed consent for participation and publication of this case report was obtained from the patient. Ethical approval was not required for this single case report in accordance with the applicable institutional policy.

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