ISSN: 2347-6567

International Journal of Allied Medical Sciences and Clinical Research (IJAMSCR)

IJAMSCR |Vol. 14 | Issue 4| Oct - Dec 2026

www.ijamscr.com

DOI : https://doi.org/10.61096/ijamscr.v14.iss4.2026.1723-1730

Effectiveness of Buteyko Breathing Technique on Dyspnea and Asthma Control in Patients with Asthma

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Published on:

21-10-2026

Published by:

Futuristic Publications

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Abstract

Background: Asthma is a chronic inflammatory respiratory condition characterized by variable respiratory symptoms and airflow limitation. Dyspnoea is one of the important symptoms and may negatively affect activity and quality of life. Breathing retraining, including the Buteyko breathing technique, is used as a non-pharmacological approach in asthma management.

Methods: A quasi-experimental study was conducted among 40 subjects with asthma. Participants were randomly allocated by simple random method into Group A (n=20), which received Buteyko breathing technique with medical management, and Group B (n=20), which received conventional therapy including diaphragmatic breathing with medical management. The intervention lasted four weeks, 30 minutes per session, three days per week, for a total of 12 sessions. Dyspnoea and asthma control were assessed using the Modified Borg Scale and Asthma Control Questionnaire (ACQ). Data were analysed using SPSS version 24. Paired t-test and independent t-test were used with $p<0.05$ considered statistically significant. Results: Group A showed a reduction in ACQ score from 2.06 ± 0.750 to 1.30 ± 0.554 and Modified Borg score from 4.60 ± 0.940 to 1.85 ± 0.745. Group B showed a reduction in ACQ score from 2.13 ± 0.784 to 1.89 ± 0.745 and Modified Borg score from 4.65 ± 0.933 to 3.80 ± 0.894. Between group post-test comparisons were significant for ACQ (t=-2.86, p=.001) and Modified Borg Scale (t=-7.49, p=.001).

Conclusion: Between-group post-test comparisons showed statistically significant differences; however, the Buteyko breathing technique group demonstrated greater improvement in asthma control and dyspnoea than conventional breathing therapy.

Keywords: Asthma, Buteyko breathing technique, dyspnoea, Modified Borg Scale, Asthma Control Questionnaire, breathing exercise.

Introduction

Asthma is a chronic inflammatory respiratory condition characterized by intermittent or variable symptoms such as dyspnoea, cough, wheezing and chest tightness. It affects individuals across all age groups and remains a major global health problem. In India, asthma contributes substantially to respiratory morbidity and disability. Clinical presentation varies between individuals and over time [1-2].

Airway inflammation and variable airway narrowing are central features of asthma. The pathophysiology involves bronchial hyperresponsiveness, airway smooth-muscle contraction, mucous

hypersecretion, mucosal oedema and airway remodelling. Allergens, respiratory infections, tobacco smoke, environmental exposures, exercise, cold air and other factors may contribute to airway inflammation and bronchoconstriction. These changes increase airway resistance and make expiration and normal ventilation more difficult [3-5].

Dyspnoea is among the most distressing symptoms. It is a subjective sensation of difficult or uncomfortable breathing influenced by physiological and psychological factors. In asthma, airway narrowing, increased resistance, premature airway closure and hyperinflation may increase the work of breathing. Patients may therefore experience breathlessness during daily activities or exercise, and the symptom may contribute to avoidance of activity and reduced functional participation [6-9].

Asthma can also have a considerable effect on quality of life. Quality of life reflects the effect of a disease on physical, emotional and social functioning. Poor asthma control may lead to activity restriction, disturbed sleep, recurrent symptoms and increased dependence on medication or healthcare services. Assessment of asthma control and quality of life therefore provides information that complements clinical measures and helps to evaluate the patient's response to treatment [10-13]

Breathing exercises are used as supportive non-pharmacological interventions in patients with respiratory disorders and in individuals with dysfunctional or hyperventilation-related breathing patterns. The Buteyko breathing technique was developed by Dr. Konstantin Buteyko and is based on breathing retraining. The technique emphasizes reduced or controlled breathing, nasal breathing, relaxation and breath-holding manoeuvres such as the control pause and maximum pause. The approach was proposed as a method of reducing excessive ventilation and improving breathing control [14-16].

Previous literature included in the present project has reported that breathing retraining may improve asthma control, quality of life and symptom perception, although effects on pulmonary function have not always been consistent. Studies of the Buteyko breathing technique have investigated its potential role as an adjunct to conventional asthma management, including effects on asthma symptoms, medication use, asthma control and quality of life. These findings provide a rationale for evaluating Buteyko breathing as a physiotherapy-based supportive intervention [17-19].

Therefore, the present study aimed to evaluates the effectiveness of the Buteyko breathing technique on dyspnoea and asthma-related quality of life/control in subjects with asthma using the Modified Borg Scale and Asthma Control Questionnaire. By comparing Buteyko breathing with conventional breathing therapy, the study examines whether the addition of structured Buteyko breathing provides greater improvement over a four-week intervention period.

Methodology

The study was approved by the institute ethics committee, IEC- RIPT/DT/21/4510.

Study Design: A two-group randomized controlled pre-test and post-test experimental study

Study Duration: Total duration six months;

Treatment duration: Four weeks. Each session lasted 30 minutes, three days per week, for 12 sessions.

Sampling Method: Simple random method (Lottery method).

Sample Size: 40 subjects with asthma; Group A (n=20) experimental group and Group B (n=20) control group.

Study Setting: Revathi Medical Centre.

Inclusion Criteria: Male and female subjects; age 25–45 years; moderate asthma (FEV1/FVC <65%) diagnosed by a pulmonologist; dyspnoea with Modified Borg Scale 4–8; medically stable subjects.

Exclusion Criteria: Musculoskeletal diseases limiting exercise; psychiatric or cognitive disorder; cardiac arrhythmias; thoracic and spinal scoliosis; substantial chest wall deformity; and heart conditions including acute myocardial infarction, cardiomyopathy and ischaemic heart disease.

Independent Variable: Buteyko Breathing Technique.

Dependent Variables: Dyspnoea and quality of life/asthma control.

Outcome Measures: Modified Borg Scale for dyspnoea and Asthma Control Questionnaire for asthma control.

Procedure

Forty eligible subjects were selected and allocated into two groups using the lottery method. Group A received Buteyko breathing technique in addition to medical management. Participants were instructed in controlled nasal breathing, relaxation, breath-holding and control-pause/maximal-pause procedures, with an activity diary and home instructions. Group B received conventional therapy with medical management and diaphragmatic breathing exercise. Pre-test assessment was performed using the Modified Borg Scale and ACQ, followed by four weeks of intervention. Post-test assessment was performed after completion of the intervention period.

Statistical Analysis

Data were tabulated and analysed using SPSS version 24. "Normality was assessed using the Shapiro–Wilk test. Data were considered approximately normally distributed when $p > 0.05$." Parametric tests were therefore used. "Paired t-tests were used to compare pre-test and post-test values within each group, while independent-samples t-tests were used for between-group comparisons."

Results

Table 1. Comparison of Asthma Control Questionnaire score between Group A and Group B in pre-test and post-test

Test	Group A Mean	SD	Group B Mean	SD	t	df	p
Pre-test	2.06	.750	2.13	.784	-0.268	38	.790
Post-test	1.30	.554	1.89	.745	-2.86	38	.001

The pre-test comparison was not significant (p=.790). The post-test comparison showed a statistically significant difference between groups (p=.001).

Graph I

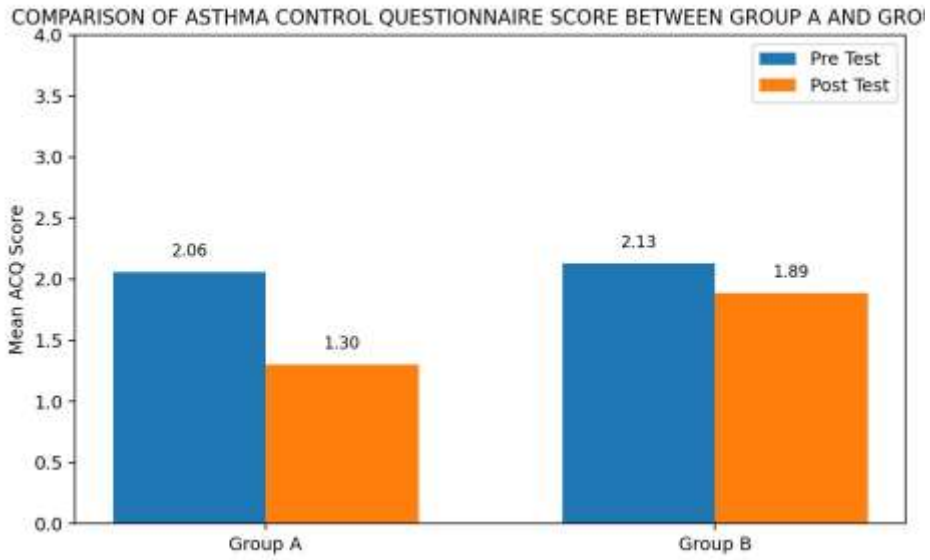


Table 2. Comparison of Modified Borg Scale score between Group A and Group B in pre-test and post-test

Test	Group A Mean	SD	Group B Mean	SD	t	df	p
Pre-test	4.60	.940	4.65	.933	-0.169	38	.867
Post-test	1.85	.745	3.80	.894	-7.49	38	.001

The pre-test comparison was not significant (p=.867). The post-test comparison showed a statistically significant difference between groups (p=.001).

Graph II

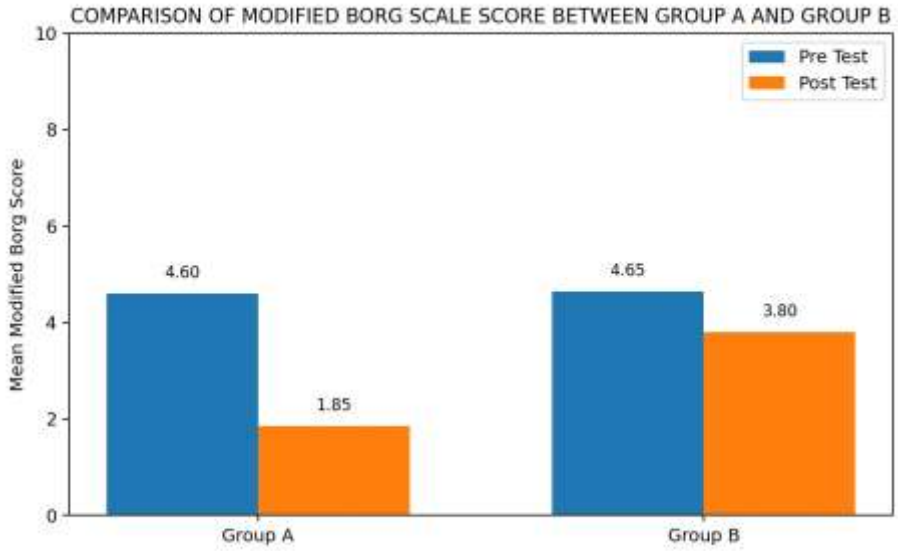


Table 3. Comparison of Asthma Control Questionnaire score within Group A and Group B

Group	Pre-test Mean	SD	Post-test Mean	SD	t	p
Group A	2.06	.750	1.30	.554	16.11	.001
Group B	2.13	.784	1.89	.745	10.96	.001

A statistically significant pre-test to post-test difference was observed within both groups (p=.001).

Graph III

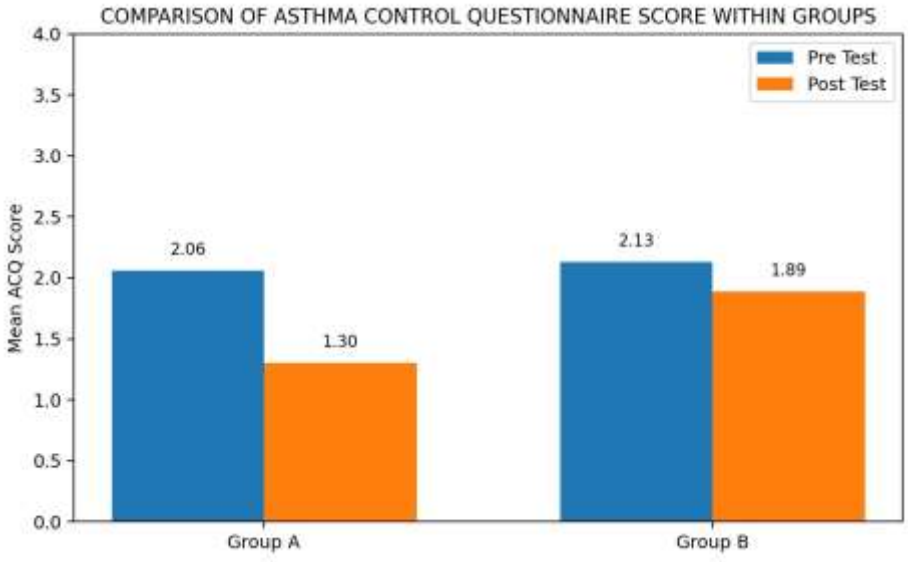
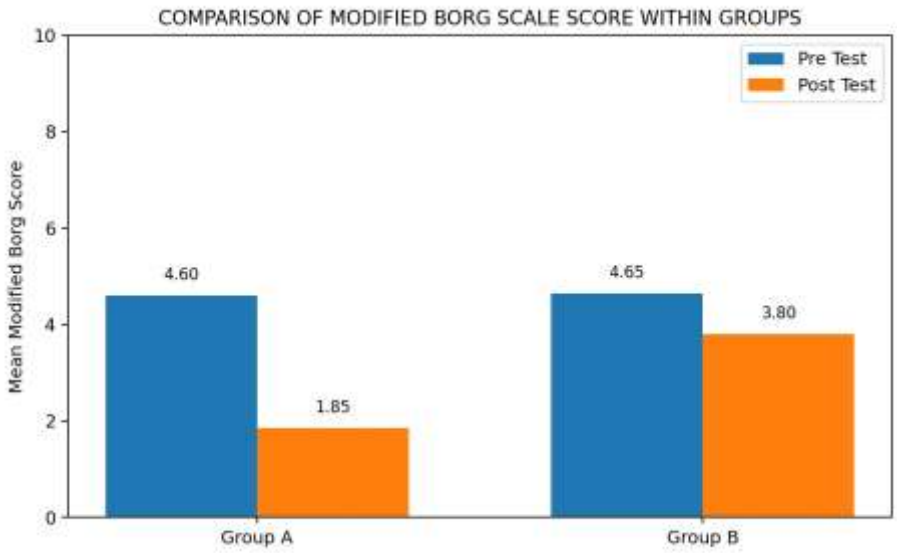


Table 4. Comparison of Modified Borg Scale score within Group A and Group B

Group	Pre-test Mean	SD	Post-test Mean	SD	t	p
Group A	4.60	.940	1.85	.745	17.16	.001
Group B	4.65	.933	3.80	.894	10.37	.001

A statistically significant pre-test to post-test difference was observed within both groups (p=.001). Graph IV



Discussion

The present study compared Buteyko breathing technique with conventional breathing therapy in subjects with asthma. Both groups demonstrated statistically significant improvements in ACQ and Modified Borg scores after four weeks. However, the magnitude of improvement was greater in Group A, which received Buteyko breathing technique with medical management. The lower post-test ACQ score in Group A (1.30 ± .554) compared with Group B (1.89 ± .745) indicates greater improvement in asthma control. Similarly, the Modified Borg score decreased to 1.85 ± .745 in Group A compared with 3.80 ± .894 in Group B, suggesting a greater reduction in perceived dyspnoea. The findings are consistent with the literature included in the project, where breathing retraining and Buteyko breathing have been investigated as supportive approaches for asthma control and quality of life. The Buteyko approach emphasizes controlled nasal breathing, reduced ventilation, relaxation and breath-holding manoeuvres. These components may help patients develop greater awareness and control of their breathing pattern and may reduce the perception of breathing difficulty. The present results therefore support the use of Buteyko breathing technique as a physiotherapy-based adjunct to conventional medical management for reducing dyspnoea and improving asthma control over the four-week intervention period.

Conclusion

This study evaluated the effect of Buteyko breathing technique on dyspnoea and asthma control/quality of life in subjects with asthma. Both Buteyko breathing and conventional breathing therapy produced significant improvements in the measured outcomes. However, the Buteyko breathing group showed significantly greater improvement in both Modified Borg Scale and Asthma Control Questionnaire scores compared with the conventional therapy group. Within the limitations of this study, Buteyko breathing technique may therefore be considered an effective supportive intervention for subjects with asthma.

Limitations and Recommendations

Limitations:

1. The study was limited to the middle-age group.
2. The intervention duration was relatively short.
3. Regular follow-up was not performed.
4. The sample size was small.

Recommendations:

1. Future studies may include smoking status.
2. Longer intervention and follow-up periods may be considered.
3. Studies with larger sample sizes are recommended

4. Additional outcome measures such as PEFR, FEV1 and FEV1/FVC may be included.

Acknowledgments

The author expresses sincere gratitude to the guide, faculty members, participants, Revathi Medical Centre, and the institution for their support and cooperation during the completion of this study.

Informed Consent

Written informed consent was obtained from the participants. Participation was voluntary, and participants were informed about the purpose and procedures of the study, their right to withdraw, and confidentiality of their information.

Conflict of Interest

The author declares no conflict of interest.

Author Contribution

Fathima Lubabah Firos.C: contributed to the study conception, data collection, intervention, data analysis and manuscript preparation.

Dr. Santhanalakshmi A: supervised the study and provided academic guidance.

Dr. P. Bright Alwin Victor: provided overall supervision and institutional guidance.

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