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Effect of the Buteyko Breathing Technique on Quality of Life Among Adults With Asthma: A Quasi-Experimental Study

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ABSTRACT

Background: *Asthma is a chronic respiratory disease that can reduce physical function, psychological well-being, social participation, and overall quality of life. In addition to pharmacological therapy, non-pharmacological interventions such as breathing exercises may support asthma self-management. The Buteyko breathing technique is a simple breathing retraining method that may help improve breathing control and quality of life among people with asthma.* ***Objective:*** *This study aimed to examine the effect of the Buteyko breathing technique on quality of life among adults with asthma in Desa Suling Wetan, Kecamatan Cermee, Kabupaten Bondowoso.* ***Methods:*** *This study used a quantitative quasi-experimental design with a pretest–posttest control group approach. A total of 20 adults with asthma were selected using purposive sampling and divided into an intervention group and a control group, with 10 respondents in each group. The intervention group received the Buteyko breathing technique, while the control group did not receive the intervention. Quality of life was measured using a questionnaire, and data were analysed using the Mann–Whitney U test.* ***Results****: The mean quality of life score was higher in the intervention group after receiving the Buteyko breathing technique than in the control group, with mean scores of 63.10 and 52.60, respectively. The intervention group also had a higher mean rank than the control group, with mean ranks of 13.35 and 7.65, respectively. The Mann–Whitney U test showed a significant difference in quality of life between the two groups (Z = -2.159; p = 0.031).* ***Conclusion****: The Buteyko breathing technique had a significant effect on improving quality of life among adults with asthma. This technique may be considered a simple, low-cost, and non-invasive complementary nursing intervention to support asthma self-management in community settings.*

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A. Introduction

Asthma is a chronic respiratory disease characterised by airway inflammation, variable airflow limitation, and recurrent symptoms such as wheezing, shortness of breath, chest tightness, and cough (GINA, 2026; WHO, 2026). Asthma remains a major noncommunicable disease because it affects both children and adults, contributes to recurrent healthcare use, and may lead to serious complications when symptoms are poorly controlled (Papi et al., 2018; WHO, 2026). Globally, asthma continues to impose a substantial public health burden, with

recent estimates showing that hundreds of millions of people are affected worldwide and asthma-related morbidity remains high, particularly in low- and middle-income countries (Wang et al., 2023; Yuan et al., 2025). Although asthma cannot be cured, appropriate pharmacological treatment, trigger avoidance, patient education, and self-management can help control symptoms and enable people with asthma to live more active lives (Cloutier et al., 2020; GINA, 2026).

The impact of asthma is not limited to respiratory symptoms but also affects patients' physical, psychological, social, and functional well-being (Kharaba et al., 2022; Papi et al., 2018). Adults with asthma may experience sleep disturbance, fatigue, reduced physical activity, emotional distress, fear of exacerbation, reduced work productivity, and limitations in social participation (Kharaba et al., 2022; WHO, 2026). These problems can reduce asthma-related quality of life and may influence the patient's ability to manage symptoms effectively (Juniper et al., 1992, 1999). Quality of life has therefore become an important patient-reported outcome in asthma care because it reflects the patient's perceived health status beyond physiological indicators alone (Apfelbacher et al., 2012; Juniper et al., 1999). Improving quality of life is particularly important in community settings, where patients may continue to experience symptoms despite routine medication and may need practical self-management strategies that are easy to perform at home (Badan Kebijakan Pembangunan Kesehatan, 2023; GINA, 2026).

Pharmacological therapy remains the cornerstone of asthma management, especially inhaled anti-inflammatory therapy and bronchodilator treatment according to symptom control and exacerbation risk (Cloutier et al., 2020; GINA, 2026). However, non-pharmacological interventions are also recommended as supportive strategies because asthma control is influenced by breathing patterns, physical activity, environmental triggers, treatment adherence, and patient self-management behaviour (GINA, 2026; Harper & Trayer, 2022). Breathing exercises have been widely studied as complementary interventions for adults with asthma, particularly among individuals who experience dysfunctional breathing or hyperventilation-related symptoms (Santino et al., 2020; Thomas et al., 2003). A Cochrane review reported that breathing exercises may provide positive effects on quality of life, hyperventilation symptoms, and lung function in adults with mild to moderate asthma, although the certainty of evidence varies across outcomes (Santino et al., 2020). These findings suggest that breathing exercises may be useful as adjunctive interventions, but they should complement rather than replace standard asthma treatment (GINA, 2026; Santino et al., 2020).

One breathing intervention that has received attention in asthma management is the Buteyko breathing technique (Bruton & Lewith, 2005; Burgess et al., 2011). The Buteyko breathing technique is a structured breathing retraining method that emphasises nasal breathing, reduced breathing volume, relaxation, breath control, and control pause exercises (Bruton & Lewith, 2005; Cooper et al., 2003). This technique is based on the assumption that some people with asthma may develop overbreathing or hyperventilation patterns that contribute to respiratory discomfort and poor symptom control (Bruton & Lewith, 2005; Thomas et al., 2003). Through controlled and reduced breathing, the Buteyko technique aims to improve breathing efficiency, reduce unnecessary respiratory effort, and increase patient awareness of breathing patterns during daily activities (Bowler et al., 1998; Opat et al., 2000).

Several studies have examined the effect of the Buteyko breathing technique on asthma outcomes, although results vary across studies (Burgess et al., 2011; Santino et al., 2020). Earlier randomised controlled trials reported that Buteyko breathing may reduce reliever medication use and improve asthma-related outcomes in selected groups of patients (Bowler et al., 1998; Cooper et al., 2003; Opat et al., 2000). A clinical trial comparing Buteyko and pranayama breathing techniques also reported improvements in quality of life among patients with asthma (Prem et al., 2013). More recent evidence has suggested that Buteyko breathing may improve asthma control and reduce medication use when practised regularly at home over a structured intervention period (Vagedes et al., 2024). Nevertheless, systematic reviews have also emphasised that the evidence base remains heterogeneous because previous studies

differ in intervention protocols, duration, sample size, outcome measures, and methodological quality (Burge et al., 2024; Burgess et al., 2011; Santino et al., 2020).

In Indonesia, asthma remains a relevant community health problem, and patients may experience recurrent symptoms that affect daily functioning and quality of life (Isfandari et al., 2025). Community-based asthma management is important because patients often live with long-term symptoms and need simple strategies to support self-care outside hospital settings (GINA, 2026; Nisa, 2023). Preliminary data in the study setting showed that asthma cases were found among residents of Desa Suling Wetan, and many clients relied mainly on routine pharmacological treatment without optimally using complementary breathing techniques. This situation indicates the need for feasible, low-cost, non-invasive nursing interventions that can be taught to clients with asthma and practised independently in the community (Harper & Trayer, 2022; Santino et al., 2020).

The Buteyko breathing technique may be relevant for nursing practice because it is simple, inexpensive, non-invasive, and can be incorporated into health education for adults with asthma (Bruton & Lewith, 2005; Burgess et al., 2011). Nurses have an important role in teaching breathing exercises, monitoring patient responses, encouraging treatment adherence, and supporting self-management behaviours among people with chronic respiratory disease (Cloutier et al., 2020; GINA, 2026). If the Buteyko technique can improve quality of life, it may provide an additional community nursing strategy to help adults with asthma manage symptoms, reduce breathing discomfort, and improve daily functioning (Prem et al., 2013; Vagedes et al., 2024). Therefore, this study aimed to examine the effect of the Buteyko breathing technique on quality of life among adults with asthma in Desa Suling Wetan, Kecamatan Cermee, Kabupaten Bondowoso.

B. Methods

This study used a quantitative quasi-experimental design with a pretest–posttest control group approach to examine the effect of the Buteyko breathing technique on quality of life among adults with asthma. The study was conducted in Desa Suling Wetan, Kecamatan Cermee, Kabupaten Bondowoso, Indonesia. The study population consisted of adults with asthma living in Desa Suling Wetan, with a total population of 22 people. A total of 20 respondents were included in this study and divided into two groups, consisting of 10 respondents in the intervention group and 10 respondents in the control group.

Participants were selected using purposive sampling according to predetermined eligibility criteria. The inclusion criteria were adults with asthma living in Desa Suling Wetan, having a history of asthma for more than one year, aged 20–60 years, not experiencing an acute asthma attack during data collection, willing to participate, and willing to provide informed consent. Respondents in the intervention group were also required to follow the scheduled Buteyko breathing exercise programme and not perform other breathing techniques during the study period. The exclusion criteria were respondents who were absent during data collection, experiencing an acute asthma attack, not cooperative during the study process, or not residing in the study area.

The intervention provided in this study was the Buteyko breathing technique, which consisted of control pause measurement, correct body posture, concentration, shoulder relaxation, monitoring nasal airflow, shallow breathing, reassessment of control pause and pulse rate, rest periods, and breathing exercise blocks. The technique was demonstrated and guided by the researcher, and respondents in the intervention group were instructed to practise it according to the procedure. The control group did not receive the Buteyko breathing technique during the study period. Data were collected using a demographic questionnaire, a Buteyko breathing technique checklist, and a quality of life questionnaire covering physical, psychological, and social domains.

Data were analysed using descriptive and inferential statistics. Descriptive analysis was used to present respondent characteristics as frequency and percentage distributions, while quality of life scores were presented using mean, median, and minimum–maximum values. The Mann–Whitney U test was used to analyse differences in quality of life between the intervention and control groups, with a p-value of less than 0.05 considered statistically significant. This study was approved by the Health Research Ethics Committee of the Faculty of Health, Universitas Nurul Jadid, Indonesia, with ethical approval number NJ-T06/008/KT/KEPK/06.2025., and all respondents provided written informed consent before data collection.

C. Results

A total of 20 adults with asthma participated in this study, consisting of 10 respondents in the control group and 10 respondents in the intervention group. Most respondents were aged 20–30 years, accounting for 8 respondents (40.0%). Based on occupation, the largest proportion of respondents were unemployed, with 7 respondents (35.0%). Most respondents had elementary school education, with 11 respondents (55.0%), and the majority were male, accounting for 13 respondents (65.0%).

Table 1: Characteristics of Respondents

Characteristics	Category	n	%
Age	20–30 years	8	40.0
	31–40 years	3	15.0
	41–50 years	3	15.0
	>50 years	6	30.0
Occupation	Unemployed	7	35.0
	Farm labourer	6	30.0
	Farmer	5	25.0
	Private employee	2	10.0
Education	No formal education	2	10.0
	Elementary school	11	55.0
	Junior high school	4	20.0
	Senior high school	3	15.0
Sex	Male	13	65.0
	Female	7	35.0

The quality of life score in the control group showed a mean score of 52.60, with a median of 55 and a minimum–maximum range of 32–66. Meanwhile, the intervention group after receiving the Buteyko breathing technique showed a higher mean quality of life score of 63.10, with a median of 66.50 and a minimum–maximum range of 43–71. The Mann–Whitney U test showed that the mean rank of quality of life was higher in the intervention group than in the control group, with mean ranks of 13.35 and 7.65, respectively. The statistical analysis showed a significant difference in quality of life between the two groups, with Z = -2.159 and p = 0.031, indicating that the Buteyko breathing technique had a significant effect on improving quality of life among adults with asthma.

Table 2: Quality of Life Scores and Mann–Whitney U Test Between Groups

Group	n	Mean	Median	Min–Max	Mean Rank	Z	p-value
Control group	10	52.60	55.00	32–66	7.65		
Intervention group after Buteyko breathing technique	10	63.10	66.50	43–71	13.35	-2.159	0.031

Overall, the results showed that adults with asthma who received the Buteyko breathing technique had better quality of life scores than those in the control group. The significant difference between groups suggests that the Buteyko breathing technique may be an effective complementary nursing intervention to improve quality of life among adults with asthma in community settings.

D. Discussion

This study found that adults with asthma who received the Buteyko breathing technique had higher quality of life scores than those in the control group. The intervention group showed a mean quality of life score of 63.10, while the control group showed a mean score of 52.60. The Mann–Whitney U test also showed a significant difference between groups, with a p-value of 0.031. These findings indicate that the Buteyko breathing technique may contribute to improving quality of life among adults with asthma.

The improvement in quality of life after the Buteyko breathing technique may be related to better breathing control and reduced respiratory discomfort. The Buteyko technique emphasises nasal breathing, shallow breathing, relaxation, control pause, and awareness of breathing patterns. These components may help people with asthma reduce overbreathing, improve breathing efficiency, and manage symptoms more effectively during daily activities. Previous studies have suggested that breathing retraining may improve asthma-related quality of life, particularly when it is performed regularly and combined with standard asthma management (Bruton & Lewith, 2005; Burgess et al., 2011; Santino et al., 2020).

Asthma can negatively affect quality of life because recurrent symptoms may limit physical activity, disturb sleep, reduce social participation, and increase psychological distress. In this study, the control group had a lower quality of life score, suggesting that adults with asthma who did not receive breathing exercise support may continue to experience functional limitations related to their condition. This finding is consistent with previous evidence showing that asthma-related quality of life is influenced not only by symptom severity but also by patients' ability to manage breathlessness, anxiety, and daily activity restrictions (Juniper et al., 1992; Juniper et al., 1999; Kharaba et al., 2022). Therefore, interventions that help patients control breathing patterns may provide benefits beyond physiological symptom control.

The significant difference between the intervention and control groups supports the role of non-pharmacological interventions as complementary strategies in asthma care. Pharmacological treatment remains the main foundation of asthma management, but breathing exercises may support self-management by helping patients recognise and regulate their breathing patterns. The Buteyko technique is particularly relevant because it is simple, inexpensive, non-invasive, and can be practised independently after proper instruction. This makes it suitable for community-based nursing practice, especially in settings where patients have limited access to structured pulmonary rehabilitation or advanced asthma education programmes.

The findings of this study are in line with previous trials and reviews reporting positive effects of breathing exercises on asthma outcomes. Cooper et al. found that breathing exercises, including Buteyko breathing, could reduce reliever medication use among people with asthma. Prem et al. also reported that Buteyko breathing was associated with improvement in quality of life among patients with asthma. A Cochrane review further concluded that breathing exercises may improve quality of life in adults with asthma, although the certainty of evidence varies across studies (Santino et al., 2020). These findings support the present study by showing that breathing exercises may have meaningful benefits for patient-reported outcomes.

The mechanism by which Buteyko breathing may improve quality of life can be understood through its effect on breathing behaviour and symptom perception. People with asthma may experience dysfunctional breathing or hyperventilation patterns that worsen dyspnoea and increase anxiety. By encouraging slower nasal breathing and reduced breathing volume, the Buteyko technique may help patients feel more in control of their breathing. This sense of control may reduce fear of breathlessness, improve confidence in managing symptoms, and support better participation in daily activities.

From a nursing perspective, the findings highlight the importance of teaching simple self-management techniques to adults with asthma. Nurses can play a key role in educating patients about breathing control, identifying triggers, encouraging medication adherence, and supporting lifestyle modification. The Buteyko breathing technique may be included as part of asthma health education, provided that patients are also reminded to continue prescribed pharmacological therapy. This approach may help strengthen patient independence and improve quality of life in community settings.

Although this study found a significant effect of the Buteyko breathing technique, the findings should be interpreted carefully. The sample size was small, and the study was conducted in one community setting, which may limit the generalisability of the findings. In addition, quality of life was measured using a questionnaire, which may be influenced by respondents' understanding, subjective perception, and emotional condition at the time of assessment. Future studies with larger samples, longer intervention periods, and stronger experimental designs are needed to confirm the effectiveness of the Buteyko breathing technique on asthma-related quality of life.

Implication and limitation

The findings of this study have practical implications for community and nursing care for adults with asthma. The Buteyko breathing technique may be considered a simple, low-cost, non-invasive complementary intervention to support asthma self-management and improve quality of life. Nurses can integrate this technique into health education programmes by teaching patients correct breathing patterns, nasal breathing, relaxation, control pause, and regular breathing practice at home. However, this study has several limitations, including the small sample size, single community setting, purposive sampling technique, and short intervention period, which may limit the generalisability of the findings. In addition, quality of life was measured using a questionnaire, which may be influenced by respondents' subjective perceptions and understanding of the questions. Future studies should involve larger samples, multicentre settings, longer follow-up periods, and stronger experimental designs to confirm the effectiveness of the Buteyko breathing technique on asthma-related quality of life.

Relevance for Practice

This study highlights the relevance of the Buteyko breathing technique as a practical complementary nursing intervention for adults with asthma in community settings. Nurses can teach this technique as part of asthma self-management education to help patients practise nasal breathing, shallow breathing, relaxation, and breath control independently at home. The technique is simple, low-cost, non-invasive, and feasible to apply in primary care and community nursing services. Integrating Buteyko breathing exercises into routine asthma education may help improve patients' ability to manage respiratory discomfort, support daily functioning, and enhance asthma-related quality of life.

E. Conclusion

This study found that the Buteyko breathing technique had a significant effect on improving quality of life among adults with asthma in Desa Suling Wetan, Kecamatan Cermee, Kabupaten Bondowoso. Respondents who received the Buteyko breathing technique showed higher quality of life scores than those in the control group. These findings indicate that the Buteyko breathing technique may be used as a simple, low-cost, non-invasive complementary nursing intervention to support asthma self-management and improve asthma-related quality of life. Nurses may consider integrating this technique into community-based asthma education while continuing to emphasise adherence to standard pharmacological treatment.

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Author Contribution

Damon Wicaksi contributed to conceptualization, study supervision, methodology refinement, data interpretation, critical revision of the manuscript, and correspondence management. Arif Eko Trilianto contributed to methodology development, intervention planning, data interpretation, and critical review of the manuscript. Siska Puspitasari contributed to data collection, data analysis, literature review, and preparation of the original manuscript draft. All authors read and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

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Declaration of Conflicting Interest

The authors declare no conflict of interest.

Declaration of Use of AI in Scientific Writing

The authors declare that generative AI and AI-assisted technologies were used to support language editing and grammatical refinement of the manuscript.

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