

Buteyko Breathing Technique versus Pranayama Technique on Asthma Control among Asthmatic Patients

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Abstract:

Context: Asthma is a persistent respiratory condition that affects individuals across all age groups. Buteyko breathing technique and pranayama technique offer numerous advantages by enhancing breath awareness, promoting nostril breathing, and reducing over breathing. **Aim:** This research aimed to compare between the effect of Buteyko Breathing technique and Pranayama technique on asthma control among asthmatic Patients. **Design:** A quasi-experimental research design (pre/post-test) was utilized to study a purposive sample of 60 adult patients with history of bronchial asthma. **Setting:** This study conducted in chest department at Benha University Hospital, Qualubya Governorate, Egypt. **Tools:** Four assessment tools were utilized, **I:** Structured Interview Questionnaire, **II:** Bronchial asthma severity scale, **III:** Bronchial asthma control scale and **IV:** St. George's Respiratory Questionnaire. **Results:** Showed a highly statistically significant difference in bronchial asthma severity between the patients in the Pranayama and Buteyko groups, post program implementation with a p-value of 0.000. There was a highly statistically significant difference between mean score among studied patients of Buteyko and Pranayama groups in terms of controlling bronchial asthma after program implementation, specifically in relation to daytime asthma symptoms, with a statistically significant P-value of 0.000. **Conclusion:** Both Buteyko Breathing technique and Pranayama Breathing technique were effective in reducing asthma severity and controlling asthma symptoms but when compared, Buteyko Breathing technique was with the higher results. **Recommendations:** Application of Buteyko Breathing technique beside traditional therapies in order to effectively alleviate asthma symptoms in a safe and economical manner.

Keywords: Buteyko Breathing Technique, Pranayama Technique, Asthma Control, Asthmatic Patients.

Introduction:

Asthma, a chronic inflammatory airway disease, poses a significant public health concern in numerous countries, affecting individuals of all ages. While it may manifest as a mild condition that does not hinder daily activities, it can also be debilitating, disrupting both routine and essential tasks (Hasoon & Abdulwahhab, 2024).

The management of asthma involves both pharmacological and physical therapy. Pharmacological treatment entails the use of bronchodilators and inhaled corticosteroids, while physical therapy aims to alleviate chronic symptoms, prevent exacerbations,

maintain normal pulmonary function, reduce hospitalization rates and prevent the decline of lung function (Swathi et al., 2021).

Combining breathing techniques with pharmacological treatment has demonstrated superior outcomes in reducing asthma symptoms and enhancing pulmonary function. Respiratory exercises are essential in medical care as they improve asthma management and are commonly used because of their cost-effectiveness, simplicity, and safety (Faleh & Sadeq, 2022).

Buteyko breathing system was formulated by Dr. Konstantin Buteyko, In the middle of

the 20th century, as an alternative form of medical treatment. Dr. Buteyko identified hyperventilation as a significant factor in the physiology of asthma, causing destabilization. The Buteyko Breathing method stands out as a distinctive form of therapy that involves controlling and holding one's breath through breathing exercises. (Mohamed, et al., 2019).

Additionally, this method highlights the importance of utilizing the diaphragm for respiration while discouraging the engagement of auxiliary muscles. Breathing through the nose is strongly encouraged throughout the practice. By utilizing the Buteyko method, the negative effects of steroids can be avoided, leading to an improved quality of life for patients. Moreover, this approach is cost-efficient and may result in higher patient compliance compared to steroid treatments.

Pranayama exercise technique, as mentioned by Jassam & Hassan (2021), is a non-pharmacological therapy that has shown potential in increasing Peak expiratory flow (PEF) and improving asthma control. Pranayama refers to a specific breathing technique practiced in Yoga, which encompasses various methods. These methods can be categorized into slow and soft rhythms or fast and forceful rhythms, each impacting the depth of breathing differently.

Nadi Shuddhi pranayama, for instance, falls under the slow and soft rhythm category. This particular pranayama technique has been found to enhance respiratory stamina, relax chest muscles, expand lung capacity, boost energy levels, induce overall calmness and improve lung functions. Notably, studies have also demonstrated the effectiveness of breathing techniques like Buteyko breathing and pranayama practices like Nadi Shuddhi in treating bronchial asthma (Swathi et al., 2021).

Respiratory nurse specialists play a pivotal role in the care of patients with asthma. They are responsible for providing comprehensive preventive and curative measures, conducting initial and follow-up assessments, advocating for patients, and ensuring a holistic approach to management (Rixsi & Alikulova, 2022). Additionally, nurses have the responsibility of developing intricate, evidence-based research, providing training and support to staff in the clinical practice field (Khalelova, 2020).

Research indicates that educating patients about this condition and emphasizing the importance of adherence to treatment are crucial for favorable outcomes (Hashemi et al., 2022). Therefore, Hassan et al. (2022) recommended that nurses educate asthmatic patients on the proper use of inhalers and breathing exercises such as the Buteyko and Pranayama techniques to enhance asthma control and severity. Consequently, this study was done to evaluate the effect of Buteyko breathing technique versus pranayama technique on asthma control among asthmatic patients.

Significance of the study:

Asthma is a widespread condition that impacts a considerable portion of the global population. It is positioned as the 16th most common cause of years lived with disability and the 28th most common cause of burden of disease. Currently, around 300 million individuals have asthma globally and it is projected that an additional 100 million may be affected by 2025. The prevalence of asthma varies between 1% and 18% in different countries and its occurrence has been on the rise worldwide. Notably, there are notable differences in asthma rates between sexes, with higher rates observed in adult women compared to men. While asthma prevalence is higher in high-income countries, the majority of asthma-related deaths occur in low- to middle-income countries (GINA, 2022).

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According to the latest data from the **World Health Organization (WHO)** published in 2020, asthma-related deaths in Egypt accounted for 7,104 cases, which is approximately 1.32% of total deaths. The age-adjusted death rate for asthma in Egypt is 10.51 per 100,000 population, ranking Egypt 59th in the world. Benha University Hospital statistics proposed that around 100 asthma patients were admitted to the chest disease department in the past year (**Benha University Hospital Statistical Office, 2023**). Additionally, approximately 30.4% of asthma patients were estimated to use complementary alternative therapies, with herbal medicine and pranayama breathing exercises being the most commonly utilized. Furthermore, the Buteyko breathing technique has shown promising results as a potential treatment for asthma (**Mohamed et al., 2018**).

Therefore, the findings of the current research can provide valuable evidence-based data on the effectiveness of these complementary alternative breathing techniques in controlling asthma among asthmatic patients and alert nurses and health care providers to encourage patients to use these techniques to minimize asthma severity and improve general health.

Aim of the study:

This research aimed to evaluate the effect of Buteyko Breathing technique and Pranayama technique on asthma control among asthmatic Patients.

Research hypotheses:

This research hypothesized that:

H1: There could be a statistical significant reduction in asthma severity among patients who practicing Buteyko technique compared to Pranayama Breathing Techniques.

H2:- There could be a significant improvement in asthma control among

studied patients using Buteyko breathing technique compared to those using pranayama breathing technique.

Conceptual Definitions:

Buteyko Breathing Technique: Is a breathing exercise that can be utilized by asthma patients to decrease hyperventilation, enhance symptoms and improve their quality of life. **Hassan, et al., (2021)**.

Pranayama Breathing Technique: It is a yoga breathing method that controls inhalation and exhalation by either removing or extending the pause between the two. **Swathi, et al., (2021)**.

Subjects & Method:

Research Design:

A quasi-experimental research design utilizing two-group (pre /post-test) approach was utilized to fulfill the aim of this study. In a quasi-experimental design, researchers assess the causal effect of an intervention on a particular population without random assignment (**Handley et al., 2018**).

However, quasi-experimental designs offer less control than experimental designs in at least one of three aspects. They involve manipulating treatment variables, manipulating the setting, or selecting subjects. In clinical nursing studies, subjects are frequently chosen based on convenience rather than through random selection (**Foreman & Mateo, 2019**). Consequently, nursing researchers are increasingly opting for quasi-experimental studies.

Setting:

The study was carried out in chest department at Benha University Hospital, Qualubya Governorate, Egypt. It is located on the 3rd floor, including four rooms, each accommodating three beds. Each room includes six beds. Available equipment is an

ECG machine, monitor, pulse oximeter, oxygen flow meter, nebulizer and a physician's office and nursing station.

Subjects:

A purposive sample of 60 adult patients with history of bronchial asthma, representing both genders, their age ranged from 21 to 60 years old.

Exclusion criteria:

- Patients with history of emphysema, heart disease, epilepsy, kidney disease and neuromuscular disease.
- Mentally retarded, psychological disorder, pregnant women.
- Patients participated in any other complementary therapy for bronchial asthma management.
- Severe bronchial asthma cases on nasal cannula or on continuous oxygen mask.

The following equation was used to estimate the sample:

$$n = \frac{Z^2 P (1 - P)}{d^2}$$

Where n indicates the sample size,
Z = Z statistics indicating the level of confidence,
P indicates the expected prevalence or proportion,
d indicates the precision for the expected prevalence of 4.7% (**Bray et al., 2020**). A sample size of 60 is required, allowing for a margin of error or absolute precision of ±5% when estimating prevalence at a 95% confidence level. This calculation considers a potential loss or attrition rate of 5%. With this sample size, the anticipated 95% confidence interval ranges from 0.3% to 9.7%. The sample size calculation was performed using the SP calculator, following the methodology described by **Naing et al. (2022)**.

Patients were divided into two equal groups, with 30 individuals in each group. The Buteyko group received routine traditional

medical treatment along with the Buteyko breathing technique for 3 months. On the other hand, the Pranayama group received routine traditional medical treatment along with the Pranayama breathing technique for 3 months. Pretest measurements were taken for both groups to evaluate their initial compatibility.

Tools of data collection:

Four tools were used to achieve the aim of the research based on current up to date review of literature to collect data pertinent to the research.

1. Structured Interview Questionnaire:

It was adopted from **Shhood et al. (2023)**. It was divided into two parts:

Section 1 focuses on patient personal data, including seven questions related to age, gender, marital status, educational background, occupation, smoking and place of residence.

Section 2 focuses on the medical background of patients, encompassing their past and current medical history. This section comprises a series of eight inquiries, covering aspects including the duration of asthma, the existence of comorbid diseases, family medical history and any prior hospitalizations related to asthma. Additionally, it delves into the present symptoms, the regular controller medication employed, the quick-relief medications utilized and any other supplementary medications being used.

2. Bronchial asthma severity scale

GINA, (2007) designed this scale to assess the patients' bronchial asthma severity. It is a four-point scale categorized into five dimensions describing criteria of bronchial asthma severity which were {Day time symptoms, nocturnal awakening, short acting beta 2-agonist use, interference with normal activity and forced expiratory volume in one second (FEV1)}.

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Scoring system

The bronchial asthma severity assessment scale was scored against a four-point scale as follows: "severe" response scored four scores, the "moderate" response scored three score, the "mild" response scored two scores, and the "intermittent" response scored one score. The total score of bronchial asthma severity ranged from 20 scores which considered the most severe to 5 scores which considered the least severity. The overall score was transformed into a percentage and subsequently classified in the following manner:

- More severe level (75% or more) = 15 to 20 scores.
- Moderate severity level (50-less than 75) =10 to14 scores.
- Mild severity level (less than 50%) = less than 14 scores.

3. Bronchial asthma control scale:

It was adopted from **GINA, (2014)**. It is a three-point scale consisting of four questions, including day and night symptoms, reliever use and activity limitation. It considered most important for assessing asthma control.

Scoring system:

Bronchial asthma control scale was scored as follow: "uncontrolled" scored as three scores, "partially controlled" scored as two scores and "controlled" scored as one score. The total scoring system as follow:

Well controlled	1 score	It was assigned for patient who had none of these criteria (day time and night symptoms, use of inhalers, and no activity limitation).
Partially controlled	2 scores	It was assigned for patient who had 1 or 2 of the pervious criteria
Uncontrolled	3 scores	It was assigned for patient who had 3 or 4 of the previous criteria.

4. St. George's Respiratory Questionnaire (SGRQ)

This tool was adopted by the researchers from **Jones et al., (2010)**. It was designed to measure and quantify overall physical health of individuals with asthma and COPD, as well as its effect on general health. It correlates well with established measures to symptoms, disability (activity limitation) and effect on psychosocial status.

Total	Symptoms	(662.5)	Activity	(1209.1)	Impacts	(2117.8)
Total scoring (3989.4)						

Scoring system:

Three component scores were derived from the SGRQ, taking into account their individual weights.

- a) **Symptoms:** This element focuses on the impact of respiratory symptoms, including how often they occur and how intense they are covered in (questions 1, 2, 3, 4, 6, 7, 8, 9).
- b) **Activity limitation:** it is concerned with activities that cause or are limited by breathlessness covered in (question 5 & 11).
- c) **Psychosocial impacts:** it covers a range of aspects concerned with social functioning and psychological disturbances resulting from airway diseases covered in (questions 10, 12, 13, 14, 15, 16, 17).

The total score is assessed by calculating the total score, which reflects the impact of the disease. Each patient's score is presented as a percentage of the overall impairment, with 100 representing the most severe health status and 0 indicating the best possible health status.

Sum of maximum possible weights for each component and total scoring:

Score= 100x summed weights from positive items in that component.

Educational program:

After an extensive literature review, the researcher developed educational booklet based on **Shhood et al. (2023)**. It consisted of two parts:

- a- **The theoretical part** included the definition, triggers, manifestations, bronchial asthma complications and general guidelines to control bronchial asthma. Importance and steps of Buteyko & Pranayama breathing techniques.
- b- **Practical part** included implementation of Buteyko & Pranayama breathing techniques.

Contents validity:

Five professors in Medical-Surgical Nursing at the Faculty of Nursing, Benha University, evaluated the tools ' content and face validity and provided valuable feedback, leading to necessary adjustments.

Tools reliability:

Asthma severity sheet's reliability was assessed using Cronbach's alpha coefficient, yielding a substantial score of 0.830. As for assessing asthma control sheet, its reliability was determined to be 0.860, while for St.GRQ, it was found to be 0.898. These findings demonstrate that this instrument is highly reliable.

Pilot research:

A pilot study was conducted with 10% of the research participants (6 patients). The patients involved in the pilot study were included in the final group of studied patients. This pilot study took place two weeks prior to the start of the main research.

Ethical and Administrative Considerations:

Approval was obtained from the Scientific Research Ethics Committee at Benha University's Faculty of Nursing before initiating the research. Permission to carry out the study was obtained by submitting an

official letter from the Dean of Benha University's Faculty of Nursing to the Director of Benha University Hospital and head of chest department at Benha University Hospital, clarifying the study's aim and expected outcomes.

Prior to gathering data, the researchers provided the participating patients with a thorough explanation of the research goals. Verbal and written consent was requested from patients to validate their voluntary involvement. The researchers guaranteed the absolute confidentiality and anonymity of all data collected. Patients were informed that they had the freedom to choose whether to take part in the study and maintained the right to withdraw at any time.

Field work:

The formal authorization was given by the Director of Benha University Hospital. The data collection period lasted for six months, starting in September 2023 and ending in February 2024.

Assessment and preparatory Phase:

During this phase, patients were divided into two equal groups (Buteyko and pranayama groups) who met the inclusion criteria. Each group included 30 patients. Every patient underwent a structured interview using a questionnaire to evaluate their baseline needs.

Planning Phase: the educational booklet was devised, reviewed and adjusted following the patients' individual needs.

Implementation phase:

Spanning three months, involved the researchers delivering the educational sessions to patients immediately after data collection. The educational sessions were implemented through five sessions, each lasting one hour and accommodating five patients.

Session one was designed to familiarize the patients with the program sessions, clarify its objectives, and explore the definition, triggers, and manifestations of bronchial asthma (both groups).

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Session two was constructed to discuss bronchial asthma complications and general guidelines to control bronchial asthma (both groups).

Session three educates the patients about the importance of Pranayama breathing technique and its steps (group 1).

Session four included explaining of Buteyko breathing technique, its importance and its steps (group 2).

Session five focuses on the practical aspects, specifically the implementation of Buteyko or Pranayama breathing techniques, tailored to the needs of each patient group.

Evaluation Phase:

Comparison between Buteyko and pranayama groups' findings was done three months later the implementation of Buteyko and Pranayama breathing techniques to evaluate the effect of both techniques on asthma severity, asthma control and general health outcomes.

Statistical analysis of the data:

The collected data were systematically organized and analyzed using the IBM computer with Statistical Package for Social Science (SPSS), version 25. Descriptive statistics such as mean and standard deviation were utilized for numeric data, while qualitative data were represented in frequency and percentage. Chi-square tests were employed to investigate associations between qualitative variables. Pearson correlation coefficients were utilized to examine relationships among numerical variables.

The independent t-test was used to compare two sample means from unrelated groups to determine if the samples are different from each other. Statistical significance was set at $p \leq 0.05$, with a p-value of 0.001 considered highly significant.

Results:

Table 1 shows that: 60% and 66% of patients in the study were between the ages of 40-60 years, with mean ages of 41.52 ± 5.21 and 42.13 ± 6.11 years in the Pranayama group and Buteyko group, respectively. In addition, 60% of the Pranayama group and 53.3% of the Buteyko group were females. Furthermore, 86.7% and 80% of patients in both groups were married, respectively. Moreover, 73.3% and 46.7% of patients in both groups had secondary education. 56.7% of the Pranayama group and 50% of the Buteyko group lived in rural areas. Additionally, 66.7% and 40% of the Pranayama group and Buteyko group were employed, while another 40% of the Buteyko group were unemployed. Importantly, there were no statistically significant differences between patients of Pranayama and Buteyko groups regarding their personal data.

Figure 1 displays that, 76.7% of pranayama group and 63.3% of Buteyko group were nonsmokers.

Table 2 illustrates that, 46.7% and 56.7% of patients in both pranayama and Buteyko groups had been suffering from asthma for more than 10 years. Additionally, 50% and 56.7% of both groups had comorbid diseases, with rates ranging between 66.7% & 58.8% for diabetes and 33.3% & 41.2% for diabetes with hypertension in both groups, respectively. Furthermore, 90% and 83.3% of both groups had a family history of asthma. In the pranayama group, 50% had no previous hospitalization, while 43.3% of the Buteyko group had been hospitalized between 1 to 3 times. Moreover, 63.3% and 70% of both groups exhibited all symptoms of asthma. Additionally, 50% of both groups used Corticosteroids and long-acting beta2 adrenergic medications as regular controller medication, while 66.7% and 73.3% of both groups used short-acting beta 2 adrenergic

medications as quick-relief medication. Furthermore, 63.3% and 56.7% used expectorants and antibiotics as additional medications. It was also noted that there were no statistically significant differences between patients in the Pranayama and Buteyko groups regarding their medical history.

Table 3 shows a highly statistically significant difference in bronchial asthma severity between patients in Pranayama and Buteyko groups, post program implementation with a p-value of .000

Figure (2) illustrates that, in the pranayama group, 50% of asthma patients were of moderate severity and 33.3% were severe before the program implementation. In contrast, in the Buteyko group, 70% were of moderate severity and 13.3% were severe. After the program implementation, the severity of asthma in the pranayama group changed to 86% moderate severity and 0% severe asthma. Similarly, in the Buteyko group, the severity changed to 100% mild severity and 0% severe asthma.

Table 4 reveals that, there was a highly statistically significant difference between mean score among studied patients of Buteyko and Pranayama groups in terms of controlling bronchial asthma after the program implementation, specifically in relation to daytime asthma symptoms, with a statistically significant P-value of .000.

Figure (3) shows that, the level of asthma control in the pranayama group was 73.3% partially controlled and 19% uncontrolled before program implementation. On the other hand, the Buteyko group had 70% partially controlled and 20% uncontrolled. After program implementation, the degree of asthma control changed to 60% partially controlled and 26.7% controlled in the pranayama group, while the Buteyko group showed 63.3% well controlled and 6.7% uncontrolled.

According to table 5, it is evident that, there were highly statistically significant differences in mean scores among the patients in the Paranayama and Buteyko groups in terms of their overall level of bronchial asthma control following the implementation of the program. The p-value was found to be .000

Figure 4 illustrates that, prior to the program implementation, 86.7% of patients in the pranayama group and 83.3% of patients in the Buteyko group had poor respiratory status. However, after the program implementation, these percentages changed to good respiratory status represented by 23.3% for the pranayama group and 70% for the Buteyko group, indicating a significant improvement in respiratory status.

Table 6 displays that, a statistically significant positive correlation existed between the severity of asthma and the degree of asthma control among the patients in the pranayama group after the program was implemented at $P = .005$. Similarly, there was a highly statistically significant positive correlation between the severity of asthma and the degree of asthma control among the patients in the Buteyko group after the program was implemented at $P = .000$.

Based on Table 7, it is evident that there was no statistically significant correlation between the severity of asthma and St. George's Respiratory status among the patients in both groups prior to the implementation of the program. However, after the program was implemented, there was a highly statistically significant negative correlation between the severity of asthma and St. George's Respiratory status among the patients in the Buteyko group. The p-value was 0.000.

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Table (1): Percentage distribution of studied patients (Paranayama and Buteyko groups) regarding their personal data (n=60)

Patients' personal data	Paranayama breathing technique group (n=30)		Buteyko breathing technique group (n=30)		X ²	p-value
	No	%	No	%		
Age					.287	.592 ^{ns}
31-<40 years	12	40.0	10	33.3		
40-60 years	18	60.0	20	66.7		
Mean ±SD	41.52±5.21		42.13±6.11			
Gender					1.071	.301 ^{ns}
male	12	40.0	16	53.3		
female	18	60.0	14	46.7		
Marital status					.480	.488 ^{ns}
married	26	86.7	24	80.0		
Unmarried	4	13.3	6	20.0		
Qualification					4.444	.108 ^{ns}
Basic education	3	10.0	6	20.0		
Secondary education	22	73.3	14	46.7		
High education	5	16.7	10	33.3		
Residence					.268	.605 ^{ns}
rural	17	56.7	15	50.0		
urban	13	43.3	15	50.0		
Occupation					4.800	.091 ^{ns}
Employee	20	66.7	12	40.0		
Housewife	2	6.7	6	20.0		
Not working	8	26.7	12	40.0		

ns not statistical significance

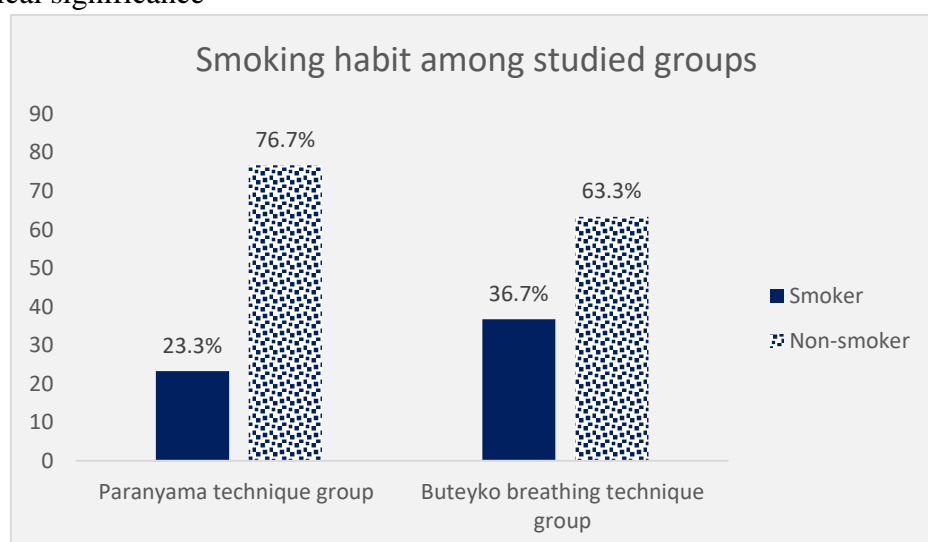


Figure (1): Percentage distribution of studied patients (both groups) regarding their smoking habits (n=60)

Table (2): Percentage distribution of studied patients (both groups) regarding their medical history (n=60)

Patients' medical history	Paranayama breathing technique group (n=30)		Buteyko breathing technique group (n=30)		X ²	p-value
	No	%	No	%		
Duration of Asthma						
less than 5 years	10	33.3	9	30.0	.743	.690 ^{ns}
5-10 years	6	20.0	4	13.3		
more than 10 years	14	46.7	17	56.7		
Presence of Comorbid Diseases						
no	15	50.0	13	43.3	.268	.605 ^{ns}
yes	15	50.0	17	56.7		
If yes	n=15		n=17			
Diabetes	10	66.7	10	58.8	.209	.647 ^{ns}
Diabetes with hypertension	5	33.3	7	41.2		
Family history of Asthma						
no	3	10.0	5	16.7	.577	.448 ^{ns}
yes	27	90.0	25	83.3		
Previous hospitalization						
no	15	50.0	10	33.3	1.725	.422 ^{ns}
1-3 times	10	33.3	13	43.3		
More than 3 times	5	16.7	7	23.3		
Current Manifestations						
All symptoms (dyspnea, coughing, hyperventilation, sputum)	19	63.3	21	70.0	1.463	.481 ^{ns}
Combination of 2 symptoms	5	16.7	2	6.7		
Other symptoms	6	20.0	7	23.3		
Used regular Controller Medication						
Corticosteroids	12	40.0	9	30.0	.894	.639 ^{ns}
Long acting beta2 adrenergic	3	10.0	6	20.0		
Corticosteroids & long acting beta2 adrenergic	15	50.0	15	50.0		
Used quick-relief Medications						
Short-acting beta 2 adrenergic	20	66.7	22	73.3	1.429	.490 ^{ns}
Anti-cholinergic	3	10.0	3	10.0		
Both	7	23.3	5	16.7		
Any additional Medications						
Expectorant	6	20.0	5	16.7	.429	.807 ^{ns}
Antibiotics	5	16.7	8	26.7		
Both	19	63.3	17	56.7		

ns not statistical significance

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Table (3): Mean score among studied patients of both groups regarding bronchial asthma severity pre and post program implementation (n=60)

Bronchial Asthma Severity	Pre program				T	p-value	Post program				T	p-value
	Paranayama breathing technique group (n=30)		Buteyko breathing technique group (n=30)				Paranayama breathing technique group (n=30)		Buteyko breathing technique group (n=30)			
	Mean	±SD	Mean	±SD			Mean	±SD	Mean	±SD		
Day time symptoms	2.86	.89	2.93	.94	.280	.781	2.36	.76	1.36	.49	6.029	.000**
Nocturnal awakening	2.43	1.43	2.40	1.45	.090	.929	2.23	.67	1.33	.47	5.931	.000**
Short acting beta 2-agonist use	2.40	1.03	2.40	1.03	.000	1.000	2.76	.43	1.70	.46	9.211	.000**
Interference with normal activity	2.66	.88	2.66	1.02	.000	1.000	2.73	.44	2.23	.43	4.400	.000**
FEV1	2.53	1.40	2.16	1.20	1.083	.283	2.66	.47	1.40	.49	10.033	.000**
Total	12.90	2.02	12.56	1.90	.657	.514	12.76	1.47	8.03	.49	16.647	.000**

**highly statistically significance p<.001

*independent t test was used

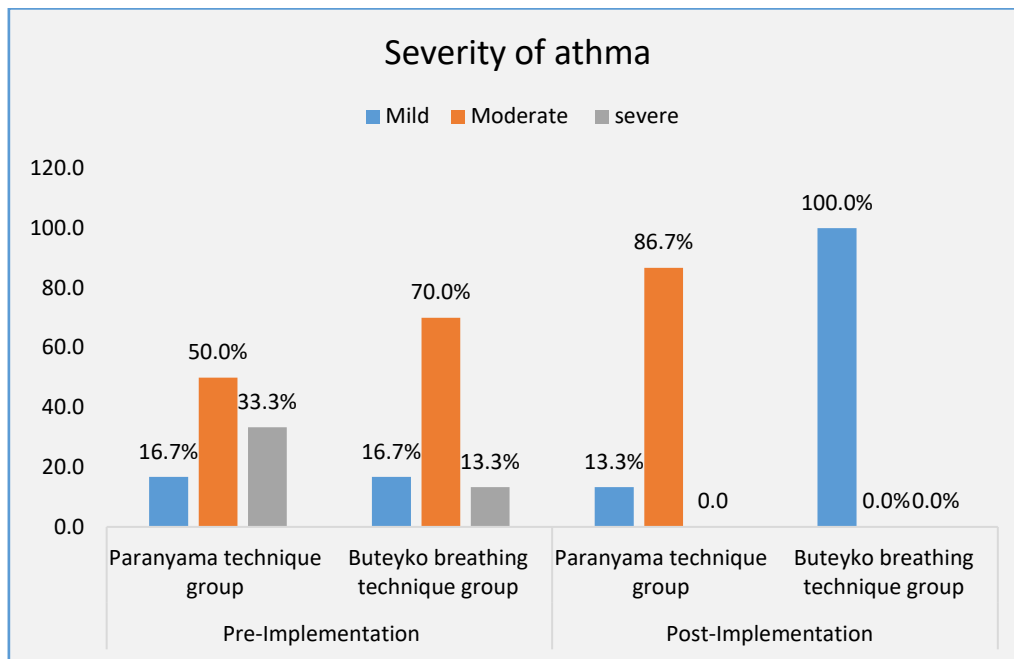


Figure (2): Percentage distribution among studied patients of both groups regarding severity of asthma pre and post program implementation (n=60)

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Table (4): Mean score among studied patients of both groups regarding degree of bronchial asthma control pre and post program implementation (n=60)

		Pre program				X2	p-value	Post program				X2	p-value
		Paranayama breathing technique group (n=30)		Buteyko breathing technique group (n=30)				Paranayama breathing technique group (n=30)		Buteyko breathing technique group (n=30)			
		No	%	No	%			No	%	No	%		
Daytime asthma symptoms	uncontrolled	7	23.3	0	0.0	13.02	.654ns	11	36.7	0	0.0	22.00	.000**
	partially controlled	23	76.7	24	80.0			19	63.3	19	63.3		
	well controlled	0	0.0	6	20.0			0	0.0	11	36.7		
Any night waking due to asthma?	uncontrolled	0	0.0	0	0.0	.08	.766 ns	10	33.3	0	0.0	12.13	.002*
	partially controlled	22	73.3	23	76.7			13	43.3	21	70.0		
	well controlled	8	26.7	7	23.3			7	23.3	9	30.0		
Reliever needed for symptoms	uncontrolled	13	43.3	18	60.0	1.66	.196 ns	12	40.0	5	16.7	12.00	.002*
	partially controlled	17	56.7	12	40.0			18	60.0	16	53.3		
	well controlled	0	0.0	0	0.0			0	0.0	9	30.0		
Any activity limitation due to asthma?	uncontrolled	3	10.0	5	16.7	.57	.448 ns	14	46.7	1	3.3	15.02	.000**
	partially controlled	27	90.0	25	83.3			16	53.3	29	96.7		
	well controlled	0	0.0	0	0.0			0	0.0	0	0.0		

* statistically significance p<.05

**highly statistically significance p<.001

ns not statistical significance

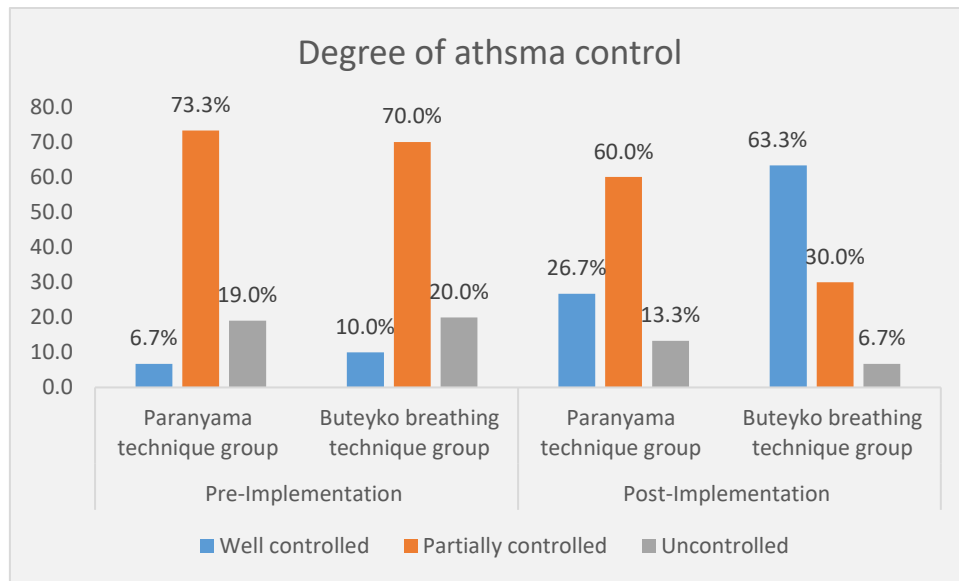


Figure (3): Percentage distribution of studied patients of both groups regarding degree of asthma control pre and post program implementation (n=60)

Table (5): Mean score among studied patients of both groups regarding their total degree of bronchial asthma control pre and post program implementation (n=60)

Degree of Bronchial Asthma Control		Paranyama breathing technique group (n=30)		T	p-value	Buteyko breathing technique group (n=30)		T	p-value
		Mean	±SD			Mean	±SD		
Total symptoms	Pre	20.30	4.17	.538	.593 ns	18.46	2.34	5.779	.000**
	Post	20.83	3.47			14.16	3.33		
Total activity	Pre	9.93	4.13	.218	.828 ns	12.70	4.14	8.066	.000**
	Post	9.73	2.83			4.76	3.44		
Total impact	Pre	13.73	4.06	.899	.372 ns	16.13	5.53	6.153	.000**
	Post	14.80	5.06			8.93	3.22		
Total	Pre	43.96	7.81	.794	.430 ns	47.30	10.85	8.883	.000**
	Post	45.36	5.66			27.86	5.08		

**highly statistically significance p<.001 ns not statistical significance *independent t test was used

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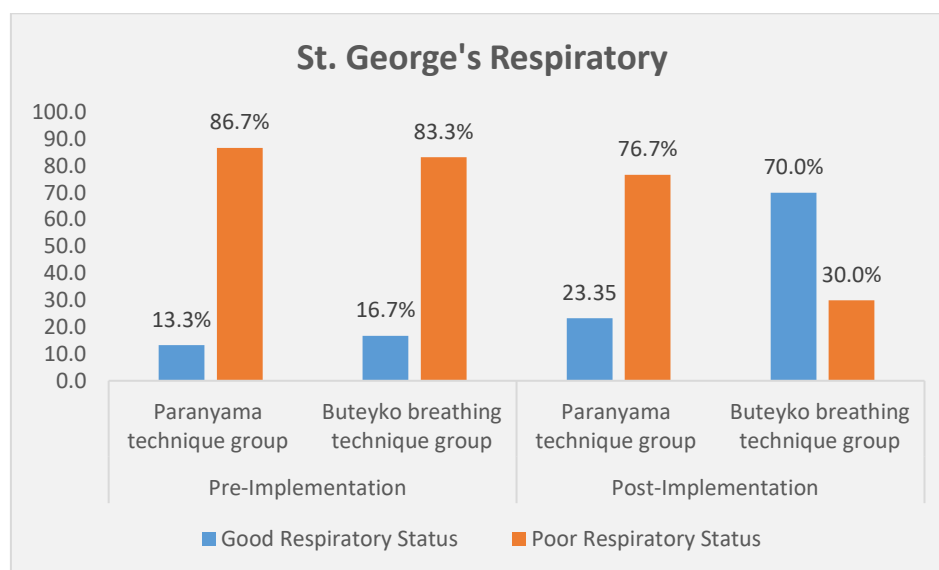


Figure (4): Percentage distribution of studied patients of both groups regarding total St. George's respiratory status pre and post program implementation (n=60)

Table (6): Correlation between severity of asthma and degree of asthma control among studied patients of both groups pre and post program implementation (n=60)

Degree of asthma control	Severity of asthma							
	Pre-program				Post program			
	Paranyama breathing technique group (n=30)		Buteyko Breathing technique group (n=30)		Paranyama breathing technique group (n=30)		Buteyko breathing technique group (n=30)	
	r	p-value	r	p-value	r	p-value	r	p-value
	.084	.660	.242	.198	.500	.005*	.626	.000**

**highly statistically significance p<.001

* statistically significance p<.05

Table (7): Correlation between severity of asthma and total St. George's Respiratory status among studied patients of both groups pre and post program implementation (n=60)

St. George's Respiratory control	Severity of asthma							
	Pre-program				Post program			
	Paranyama breathing technique group (n=30)		Buteyko Breathing technique group (n=30)		Paranyama breathing technique group (n=30)		Buteyko breathing technique group (n=30)	
	r	p-value	r	p-value	r	p-value	r	p-value
	-.032	.865	-.103	.588	-.123	.518	-.783	.000**

**highly statistically significance p<.001

Discussion:

Bronchial asthma is a prevalent and potentially severe chronic condition that places a significant burden on patients, their families, and the community. Buteyko breathing technique is a complementary approach utilized to manage hyperventilation, which has the potential to enhance asthma symptoms, quality of life and decrease the use of bronchodilators in adult asthma patients. **Hassan, et al., (2021).**

Pranayama is a form of breathing technique within the practice of Yoga. Various methods exist for practicing pranayama, some involving slow and gentle rhythms while others involve fast and forceful rhythms that deepen breathing, relax chest muscles, expand the lungs, boost energy levels, induce overall relaxation and improve lung function. **Swathi, et al., (2021).**

The findings are discussed in three parts: the initial part covers personal data, including personal characteristics and medical history of the patients in the Buteyko and pranayama groups. The second part examines the severity of bronchial asthma in both groups before and after the program was implemented. The final part focuses on the control of bronchial asthma in the Buteyko and pranayama groups before and after the implementation of the program.

The results of the present research indicated that the initial personal characteristics were comparable in both groups post-randomization, with no statistically significant variances. This suggests uniformity and equivalence between the two groups.

In terms of age, approximately two-thirds of the patients studied fell within the 40-60 age range in the Pranayama and Buteyko groups, with mean ages of 41.52 ± 5.21 and

42.13 ± 6.11 years, respectively. This observation could be linked to the higher prevalence of asthma in middle-aged and elderly individuals compared to younger age groups. This discovery aligns with the research conducted by **Zhang and Huang (2021)** on "Characteristics of older adult hospitalized patients with bronchial asthma: a retrospective research," which revealed that nearly three-quarters of the studied patients were under 65 years old.

Similarly, **Mohamed et al. (2019)** investigated "The effect of Buteyko breathing technique among patients with bronchial asthma" and found that over half of the research participants were over fifty years old, with a mean age of 48.9 ± 14.3 years. In contrast, **Abd El Hakeem et al. (2022)** in their research titled "Effect of implementing respiratory guidelines on asthmatic patients" noted that only one-third of the research and control groups were over 50 years old.

Pertaining to gender; about two thirds of Pranayama group and more than half of Buteyko group were females. This gender disparity may be attributed to sex hormones, which place females at a higher risk for bronchial asthma compared to males. There is strong evidence suggesting that sex hormones play a significant role in determining various biological sex differences, including genetic, pulmonary and immunological factors.

This observation aligns with the findings of **Vagedes et al. (2024)**, who reported in their research on "Effect of Buteyko breathing technique on clinical and functional parameters in adult patients with asthma" that nearly two thirds of their research participants were females.

Similarly, **Yung et al. (2019)** highlighted in their research on "Sex hormone, gender, and asthma in allergy asthma immunology"

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and found that females exhibit a higher prevalence of asthma compared to males, particularly after puberty, due to the influence of sex hormones on asthma development.

Furthermore, **Negash et al. (2020)** discovered in their research on "Determinants of Acute Asthma attack among Adult Asthmatic Patients visiting hospitals in Tigray, Ethiopia" that just below two-thirds of their patients were adult females with bronchial asthma. Additionally, **Alghamdi et al. (2022)** found in their investigation on "Association between asthmatic patients' asthma control test score and the number of exacerbations per year in King Abdul-Aziz Medical City, Riyadh" that less than three quarters of their subjects were females.

This was in contrary to **Eissa, et al., (2020)** on their research about "Outcome of an educational program on bronchial asthma self – management" and **Toppila –Salmi et al., (2021)** on their research about "risk factors for severe adult – onset asthma" who found that, more than half of the studied patients were males.

Moreover, **David & Patil, (2022)** illustrated on their research entitled "Immediate effect of Buteyko breathing technique versus stacked breathing technique in asthma patients" that male gender represented the largest proportion. Also, **Abd El Hakeem et al., (2022)** found on their research about "Effect of implementing respiratory guidelines on asthmatic patients" that more than one third of research group and more than half of control group were males.

In term of marital status, the current research findings indicate that the majority of individuals in both groups were married, possibly due to cultural influences within the community under research. This aligns with **Almasry et al., (2021)** whose research

entitled "Effect of Different Nursing Educational Methods about Correct Uses of Inhaler Devices on Clinical Improvement for Asthmatic Patients" where the majority of studied patients were married.

However, this contrasts with the findings of **Solet et al., (2019)** in their research entitled "A cross Sectional Survey to estimate Prevalence and Associated Factors of Asthma on Reunion Island, Indian Ocean" who suggested that marital status could affect the prevalence of suspected bronchial asthma with single, divorced, and widowed adults showing higher rates. This discrepancy may be linked to the increased risk of asthma due to exposure to stressful life events.

Concerning qualification, about three quarters of Pranayama group and nearly half Buteyko group had secondary education. This outcome may be attributed to the predominantly rural background of the studied patients. This align with **Akbar et al., (2020)** who stated on their research entitled "The Effect of Combination Pranayama Yoga and Endurance Training Exercise on Peak Expiratory Flow (PEF) in Adult Asthmatic Patients" that nearly half of patients in research group were middle educated and in the control group, half of them were elementary education.

This was in contrary to **Ilmarinen et al., (2022)** whose research entitled "level of education and asthma control in adult onset-asthma" who suggested a link between lower education levels and uncontrolled bronchial asthma. On contrary, **Abd El Hakeem et al.,(2022)** mentioned that more than half of research and control groups were illiterate .

Regarding area of residence, more than half of Pranayama group and half of Buteyko group lived in rural areas. This could be attributed to agriculture environment of

Benha Governorate. The prevalence of rural residency among the population may account for the highest exposure to asthma triggers such as pollen and dust due to increasing plants in these areas. This aligns with **Mohamed et al. (2019)** who indicated that nearly three quarters of research group and more than two thirds of control group were from rural areas.

This was in contrary with **Eissa et al.,(2020)** who stated that more than two thirds of their sample were urban population. Moreover, **Ibrahim et al., (2019)** whose research entitled “Effect of Self-Management Program on Knowledge, Practice, and Self Efficacy” and reported that more than half of studied patients lived in urban areas. Also, **Mesones et al., (2020)** whose research entitled “Rural and urban asthma; are they different?” indicated that only individuals in urban population showed a higher prevalence of symptoms in contact with allergens.

Concerning occupation, about two thirds of Pranayama group and less than half of Buteyko group were employees. It could be attributed to their educational background. This was in in the same line with **Okab et al., (2022)** who showed on their research about “Impact of pharmacist education program to improve inhalation technique in asthmatic patients” that less than half of them were employed. Also, **Mohamed et al., (2019)** indicated that more than one third had a manual work.

This was in contrary to **El Saka et al., (2019)** who studied “Effect of an educational program regarding self-care management behaviors for patients with bronchial asthma” and found that, more than half of their sample was not working. Also, **Abouelala, et al., (2017)** found on their research about “Effect of “Buteyko breathing technique on quality of

life among asthmatic patients” that more than half of the subjects were unemployed.

Regarding smoking, more than three quarters of Pranayama group and nearly two thirds of Buteyko group were nonsmokers. This may be related to more than half of both studied groups were females which uncommon for females to be smokers in our Egyptian community. This result was in the same line with **Hasoon & Abdulwahhab (2024)** whose research about “Effectiveness of Buteyko Technique, Pursed-Lip Breathing, and Inhaler Technique Program on Asthma Control for Patients with Asthma” and indicated that three quarters of patients were nonsmokers.

This also consistent with **Jyoti et al., (2020)** who found on their research about “Compliance & Practices Related to Inhalation Therapy (MDI/DPI) Among Asthma Patients” that most of the participants were non-smokers. Also, **Huidrom, et al., (2016)** reported on their research about “Effectiveness of Buteyko breathing technique on respiratory physiological parameters among patients with bronchial asthma” that more than half of subjects were non-smokers. Moreover, **Bayomi et al., (2018)** who found in their research about “Effect of nursing intervention program on nurses’ knowledge, practices and patients’ outcome with bronchial asthma” that, more than three quarters of their sample were nonsmokers.

On the other hand, it was incompatible to **Tiotiu et al., (2021)** who found in their research to assess the “Impact of tobacco smoking on adult asthma outcomes” that, more than half of patients were smokers and concluded that cigarette smoking is linked to exacerbating asthma symptoms.

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In the current research, it was observed that nearly half of Pranayama group and more than half of Buteyko group suffered from asthma for more than 10 years. This finding could be attributed to the chronic nature of the disease with increasing age; there is a possibility of changes in immune responses due to aging affecting both innate and adaptive systems at the same time.

This was contradicted with **Elsaid et al., (2023)** whose research entitled “Comparison of the effects of Buteyko and diaphragmatic breathing technique on improving pulmonary functions and asthma control among patients with bronchial asthma” indicated that less than half had Bronchial Asthma since 2 to 5 years, similarly, **Mohamed et al., (2019)** found that two fifth of their studied patients had bronchial asthma for less than three years.

Concerning presence of comorbid diseases, half of Pranayama group and more than half of Buteyko group suffered from comorbid diseases as diabetes and hypertension. This prevalence of comorbidities may be attributed to the association between asthma and chronic diseases. This result was in the same line with **Rogala et al., (2019)** in their research about “The relationship between asthma and diabetes” and concluded that the effect of asthma on diabetes does not seem to be significant except for patients with severe asthma.

This aligns with **El said et al., (2023)** who found that less than half in group I suffered from DM, while in group II, they suffered from hypertension.

On contrary, **Luthra et al., (2019)** in their research about “Evaluation of association of allergic rhinitis with bronchial asthma” reported that, more than three quarters of

participants had allergic rhinitis with bronchial asthma.

Regarding family history, majority of both groups had family history of asthma. This may be attributed with genetics and environment which appears to interact in asthma etiology. This result comes in the same line with **Bahattachajee et al., (2018)** who studied “Prevalence and risk factors of asthma and allergy- related diseases among adolescent” and mentioned that, family history is one of the risk factors for asthma at a very early age and susceptibility to environmental triggers. Moreover, **Trivedi & Denton, (2019)** who studied “Asthma in children and adults- what are the differences and what they can tell us about asthma” and mentioned that multiple genes are thought to contribute to bronchial asthma.

Regarding previous hospitalization, half of Pranayama group had no previous hospitalization whereas; nearly half of Buteyko group had previous hospitalization between 1 to 3 times. This may due to severity of asthma was moderate among half of Pranayama and about three quarters of Buteyko group preprogram implementation.

These results were in the same line with **Pereira et al., (2023)** whose research entitled “Asthma hospitalizations: A call for a national strategy to fight health inequities” and mentioned that, There is evidence that individuals with asthma residing in deprived areas may experience compromised asthma outcomes throughout the entire spectrum of patient care, resulting in increased hospitalizations and a greater risk of asthma-related deaths.

These results were incompatible with **Chhiba et al., (2020)** who studied “Prevalence and characterization of asthma in hospitalized and non-hospitalized patients

with COVID19” and concluded that despite a substantial prevalence of bronchial asthma in their cohort research, it wasn’t associated with an increased risk for hospitalization.

Regarding current manifestation of asthma, it was observed that about two thirds of Pranayama group and less than three quarters of Buteyko group had all symptoms of asthma (coughing, dyspnea, hyperventilation and sputum). These results were congruent with **He et al., (2019)** whose research entitled “Frequency of signs and symptoms in persons with asthma” and found that, combination of wheezing, breathlessness, chest tightness and cough was reported in more than two thirds of patients.

On contrary, **Solet et al., (2019)** indicated that, the prevalence of symptoms indicating asthma were relatively low. This could be attributed to the hot climate in India where Solet's research was held, in contrast to our research location where there is a higher risk of exposure to pollen, pollution, and seasonal changes.

Regarding regular controller medications ,it is was clear from findings that, half of both groups take corticosteroids and long acting beta2 adrenergic as regular controller medications of asthma. Also, two thirds of pranayama group and about three quarters of Buteyko group, use short-acting beta 2 adrenergic as quick-relief medications for asthma. This was in the same line with **Abouelala et al., (2017)** who studied “effect of Buteyko breathing technique on quality of life among asthmatic patients at Mansoura university hospital” and found that, less than two thirds of the Buteyko group and majority of control group used short-acting beta 2 adrenergic (SABA) as quick-relief medication.

This was disagreed with **Canonica et al., (2021)** who studied “Manifesto on the overuse of SABA in the management of asthma: new approaches& new strategies” and concluded that the risks of overusing short-acting beta 2 adrenergic (SABA) including an increase in asthma related deaths. Also, **GINA, (2022)** suggested in their most recent report to reduce the utilization of short-acting beta 2 adrenergic due to its association with tachycardia.

Concerning use of any additional medications, it was found that, about two thirds of Pranayama group and more than half of Buteyko group used expectorants and antibiotics as additional medications. This was contradicted with **Kurukulaaratchy et al., (2021)** in their research about “A role of mucolytic and expectorants in aiding inhaled therapies in asthma” and reported that, any supporting evidence base for use of mucolytic and expectorants in patients with asthma is limited.

Pertaining to severity of bronchial asthma symptoms, there was high statistically significant differences among studied patients of Buteyko and Pranayama groups regarding bronchial asthma severity post program implementation at $P= .000$. Severity of asthma was moderate as represented by half and about three quarters of Pranayama and Buteyko groups preprogram implementation which changed to be moderate severity among majority of Pranayama group and mild severity among all Buteyko group post program implementation. This improvement can be attributed to the comprehensive coverage of different disease aspects and its management through both theoretical and practical sessions offered. This finding supports the first research hypothesis.

This result was in the same line with **Jinsabin (2018)**, on his research entitled

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“Effectiveness of Buteyko breathing technique and active cycle of breathing technique in the management of dyspnea among asthmatic patients” and revealed that, Buteyko breathing technique was seen to be efficient in reduction of dyspnea and enhancing the rhythm of breathing as opposed to the active breathing cycle.

Regarding bronchial asthma control, there were highly statistically significant variances in mean scores among the patients in the Pranayama and Buteyko groups in terms of their overall level of bronchial asthma control following the implementation of the program. The p-value was found to be .000. It was noticed that degree of asthma control was partially controlled in about three quarters & uncontrolled among about one fifth of Pranayama and Buteyko group preprogram implementation which changed to be well controlled among nearly one third and two thirds of both groups, respectively post program implementation. This improvement could be attributed to the program's efficacy, with the implementation of the Buteyko technique proving successful in controlling asthma symptoms. This finding supports the second research hypothesis.

This was in the same line with **Mohamed et al (2019)** who concluded that, practicing Buteyko Breathing exercise had a beneficial impact on alleviating asthma symptoms, reducing their severity, and enhancing asthma control among asthmatic patients. This also aligns with **Grznar, et al., (2022)** who studied “Influences of Breathing Exercises and Breathing Exercise Combined with Aerobic Exercise on Changes in Basic Spirometry Parameters in Patients with Bronchial Asthma” and highlighted that adding exercises to pharmacological treatment would improve asthma symptoms.

Moreover, **Hasoon & Abdulwahhab (2024)** indicated that there were highly statistically significant differences (p -value > 0.001) between the pre and post-test for controlling asthma in patients. Moreover, **O'Neill & Dogra ,(2020)** conducted a research to evaluate “The effect of aerobic exercise in improving asthma control and quality of life in adult asthmatic patients” and noted an improvement in ACQ scores after 6 weeks of the intervention (p -value = 0.02).

Regarding total St. George's respiratory status, it was found that majority of patients had poor respiratory status in Pranayama and Buteyko groups preprogram implementation which changed to be good respiratory status among more than one fifth of Pranayama group & nearly three quarters of Buteyko group post program implementation. This finding illustrates the positive effects of the Buteyko breathing technique on alleviating asthma symptoms.

This aligns with **Sharma et al., (2019)** in their research to “Compare the effect of Buteyko breathing technique and pursed lip in patient with COPD” and concluded that, over a 4-week period, COPD patients experienced notable enhancements in dyspnea and pulmonary function test results when practicing Buteyko breathing exercises as opposed to pursed lip breathing.

The results of the current research revealed that there was a statistically significant positive correlation between severity of asthma and degree of asthma control among studied patients of Pranayama group post program implementation at $P = .005$. Whereas, there was highly statistically significant positive correlation between severity of asthma and degree of asthma control among studied patients of Buteyko groups post program implementation at $P = .000$. These results show the effectiveness of

Buteyko breathing technique in reducing asthma severity and controlling asthma symptoms compared with Pranayama breathing technique post program implementation.

This was agreed with **Swathi et.al. (2021)** who studied “Effectiveness of Buteyko breathing technique versus Nadi Shuddhi Pranayama to improve pulmonary function in subjects with Bronchial Asthma” and demonstrated better trends of improvement in the Buteyko group on pulmonary functions for patients with bronchial asthma than in Pranayama group. While, both groups undergoing breathing training displayed notable enhancements in pulmonary functions from baseline values, the Buteyko method demonstrated statistically significant improvements in comparison to Pranayama method.

Moreover, the current research reveals that, there was no statistically significant correlation between severity of asthma and St. George's Respiratory status among studied patients of both groups preprogram implementation. Whereas, there was highly statistically significant negative correlation between severity of asthma and St. George's Respiratory status among studied patients of Buteyko group post program implementation at $P = .000$. These results indicate the efficacy of the Buteyko breathing method in enhancing the respiratory condition of patients following the implementation of the program, as opposed to the Pranayama breathing technique.

This was in the same line with **Nelsen et al., (2017)** who mentioned in their research entitled " Evaluation of the psychometric properties of the St George's Respiratory Questionnaire in patients with severe asthma” that, demonstrated that the SGRQ has acceptable psychometric properties in

patients with severe asthma, and appears to be a good instrument for identifying response to therapy in patients with severe asthma.

Conclusion:

Based on the findings of the current study, it can be concluded that both the Buteyko breathing technique and Pranayama breathing technique were successful in decreasing asthma severity and controlling asthma symptoms among asthmatic patients. But, upon comparison, the Buteyko breathing technique emerged as the superior method, thus confirming the research's hypotheses.

Recommendations:

- Further research studies are needed to focus on researching new approaches to alleviate asthma symptoms and minimize the reliance on asthma medications as possible.
- Replication of the current research on a larger probability sample to achieve generalization of the results.
- Conducting training programs for nurses caring for patients with asthma about Buteyko breathing technique to be implemented in patient care.
- Incorporation of Buteyko breathing technique into the treatment regimen for patients with asthma, in addition to traditional therapies, as a safe and cost-effective approach in alleviating asthma symptoms.
- Patients with asthma admitted to the chest department should receive a handout on the Buteyko breathing technique for their reference and use.

References:

Abd El Hakeem B., El Melegy O., Hantera M. & Allam Z., (2022). Effect of Implementing Respiratory Guidelines on Asthmatic Patients. Thesis for master degree

Buteyko Breathing Technique versus Pranayama Technique on Asthma Control among Asthmatic Patients

in medical surgical nursing, critical care nursing specialty, Egypt.

Abouelala F.M., Sherif W.I., Elshamy K.F. & Shalabi N.M. (2017).Effect of Buteyko Breathing Technique on Quality of life among Asthmatic Patients at Mansoura university hospital ,doctoral thesis in medical surgical nursing, Egypt.
Doi:10.21608/MNJ2017.176516

Akbar N., Kusnanto K., Amin M., Sajidin M., Kurniawati N. & Bakhtiar A., (2020). The Effect of Combination Pranayama Yoga and Endurance Training Exercise on Peak Expiratory Flow (PEF) in Adult Asthmatic Patients. *Journal Keperawatan Padjadjaran* ISSN 2338-5324 (print) ISSN 2442-7276 (online) Volume 8 Issue 2 August 2020. <http://jpk.fkep.unpad.ac.id> DOI : 10.24198/jpk

Al Masry M., Mostafa N., Abd Elaziz S. & Abo Zaid H., (2021). Effect of Different Nursing Educational Methods about Correct use of Inhaler Devices on Clinical Improvement for Asthmatic Patients. *Assuit scientific nursing journal*, 25(9),67-77

Alghamdi M., Aljaafri Z.A., Alhadiq K.H., Alamro S.A., Alfaryan S.M., Al Swaidan O. & Mohamud M.(2022). Assosiation between Asthmatic Patients' Asthma control test Score and the Number of Exacerbations per year in king Abdulaziz Medical Ccity, Riyadh, cuteus,14(4),24001.

Bayomi R., Taha N., Zaton H. & El shora A. (2018). Effect of Nursing Intervention Program on Nurse's Knowledge, Practices and Patients Outcomes with Bronchial Asthma. *The journal of nursing care*, (7),1-5.

Benha University Hospital Statistical Office, (2023): Number of asthma patients admitted to chest department at Benha University Hospital.
Bhattachajee S., Haldar P., Gobal Maity S., Debnath S., Moitra S., Saha S., Mitra R., Annesi-Maesano I., Garcia-Aymerich J. & Moitra S.(2018). Prevalence and risk Factors of Asthma and Allergy- related Diseases

among Adolescent (performance research): rationale and methods. *ERJ Open Res*, 4(2), 27-34.

Bray F., Ferlay J., Soejomataram, I., Siegel R. L., Torre L. A. & Jemal A. (2020). Global Cancer Sstatistics 2018: GLOBOCAN estimates of Incidence and Mortality Worldwide for 36 cancers in 185 countries. *CA Cancer Journal of Clinicains*, 70(4), 313. <https://doi.org/10.3322/caac.21609>.

Canonica G., Paggiaro P., Blasi F., Musarra A., Richeldi L., Rossi A. & Papi A.(2021). Manifesto on the overuse of SABA in the management of Asthma: New approaches& New Strategies. *Therapeutic advances in Respiratory Disease*, 15,1-6.

Chhiba K.D., Patel G.B. Vu T., Chen M.M. Gue A., Kudalty E., et al.,(2020). Prevalence and Characterization of Asthma in Hospitalized and None Hospitalized Patients with COVID19. *Allergy Clin Immunol*, 146(2),307-14

David J. & Patil H., (2022). Immediate Effect of Buteyko Breathing Technique versus Stacked Breathing Technique in Asthma Patients. *International journal of health science and research*. 12(6).158:167.

Eissa H., Farahat T., Hegazy N. & Barakat A. (2020). Outcome of an Educational Program on Bronchial Asthma Self – Management. *The Egyptian journal of hospital medicine*, 81(3),1699-703.

El Saka D., Shahin E. & Abdel Kader H. (2019). Effect of an Educational Program regarding Self-Care Management Behaviors for Patients with Bronchial Asthma. *Port said scientific journal of nursing*, 6(2), 1-22.

El said R., Zahran W. & Hafez D.(2023). Comparison of the Effects of Buteyko and Diaphragmatic Breathing Technique on Improving Pulmonary Functions and Asthma Control among Patients with Bronchial Asthma. *EJNHS | ISSN 2682-2563 Egyptian*

Journal of Nursing & Health Sciences, 2023
EJNHS Vol.4, No.2

Faleh J.N. & Sadeq A. (2022). Preoperative Incentive Spirometer to Prevent Postoperative Pulmonary Complications following Open Heart Surgeries: A Randomized Single Blinded Multi-Centric Clinical Trial. *J Contemp Med Sci* 2022; 8(4):270-7.

Foreman, M. & Mateo M. (2019). Research for advanced Practice Nurses: From evidence to practice, 2nd ed, Springer publishing company, New York. P.p. 137.
<https://www.medigraphic.com/pdfs/uro/ur-2019/ur196e>.

Global Initiative for Asthma (GINA) (2007). Global Strategy for Asthma Management and Prevention. P.17, Available at: <https://ginasthma.org/wpcontent/uploads/2019/01/2007-GINA.pdf>. Accessed on 12-9-2023

Global Initiative for Asthma (GINA) (2022). Global Strategy for Asthma Management and Prevention. GINA report , Available at <http://www.ginaasthma.org>. Accessed on 15-9-2023

Global Initiative for Asthma (GINA) (2014). Asthma, Global Strategy for Asthma Management and Prevention. Guidelines for the diagnosis and management of asthma, summary,33 Available at <http://www.nhlbi.gov/guidelines/asthma/asthgdln.htm>. Accessed on 14-9-2023

Grznar L., Suchan D., Labudova J., Odraska L., & Matus I., (2022). Influences of Breathing Exercises and Breathing Exercise Combined with Aerobic Exercise on Changes in Basic Spirometry Parameters in Patients with Bronchial Asthma. *MDPI journal, applied science.* 12(14): 1-11.
<https://doi.org/10.3390/app12147352>. 12

Handley, M. A., Lyles, C. R., McCulloch, C., & Cattamanchi, A. (2018). Selecting and Improving quasi-experimental Designs in Effectiveness and Implementation Research. *Annu Rev Public Health,* 39, 5–25.

<https://doi.org/10.1146/annurev-publhealth-040617-014128>.

Hashmi M., Tariq, M. & Cataletto, M., (2022). Asthma. *Statpearls in National Library of Medicine, Treasure Island (FL): Stat pearls publishing,* e book. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK430901/> Accessed on 20/4/2024.

Hasoon Z. & Abdulwahhab M.,(2024). Effectiveness of Buteyko Technique, Pursed-Lip Breathing, and Inhaler Technique Program on Asthma Control for Patients with Asthma *Bahrain Medical Bulletin, Vol. 46, No. 1, March 2024.*

Hassan, E., Abusaad, F. & Mohammed, B. (2022).Buteyko Breathing Technique: Effect of the Buteyko Breathing Technique on Asthma Severity and Control. *National library of Medicine,* 16(1), 45-50.

He Z., Feng J.,Xia J.,Wu Q.,Yang H.& Ma Q.(2019).Frequency of Signs and Symptoms in Persons with Asthma, *Respiratory Care,*65(2) Doi:10.4187/respcare.06714.

Huidrom K., Shiroor G. & Ray S., (2016). Effectiveness of Buteyko Bbreathing Technique on rRespiratory Physiological Parameters among Patients with Bronchial Asthma. *International journal of recent scientific research.* 7(5):11328-11331.

Ibrahim F.H., Ahmed S.S., Ahmed A.O. (2019). Patients with Bronchial Asthma: Effect of Self-Management Program on Knowledge, Practice, and Self Efficacy. *Egyptian J Health Care* 2019; 10(1):60519.

Ilmarinen P., Stridsman C., Bashir M.,Tuomisto L.E., et al.,(2022). Level of Education and Asthma Control in Adult Onset Asthma. *J Asthma,* 59(4), 840-9.

Jassam A.K. & Hassan H.S. (2021). The Effectiveness of a Self-Care Instructional Program on the Health-Related Quality Of Life for Patients with Permanent Pacemaker In Baghdad Teaching Hospital. *J Cardiovas Dis Res* 2021; 12(3):1056-74.

Buteyko Breathing Technique versus Pranayama Technique on Asthma Control among Asthmatic Patients

- Jinsabin M, (2018).** A Comparative Research on Effectiveness of Buteyko Breathing Technique and Active Cycle of Breathing Technique in the Management of Dyspnea among Asthma Patients, Master thesis, Master of physiotherapy.
- Jones P., Quirk F. & Baveystock C., (2010).** The St George's respiratory Questionnaire. *Respiratory medicine*, 85(2), 25-31.
- Jyoti K, Aggarwal D, Kaur P, et al. (2020).** Compliance & Practices Related to Inhalation Therapy (MDI/DPI) Among Asthma Patients. *Int J Med Surg Nurs* 2020; 3(1):25-31.
- Khalelova, A. (2020).** The Role of Nurses in the Self- Management of Patients with Bronchial Asthma. Master thesis, social services, health and sports, degree program in advanced nursing practice.
- Kurukulaaratchy R.J., Rupani H., Fong W.& Kyyaly A., (2021).** A role of Mucolytic and Expectorants in Aiding Inhaled Therapies in Asthma, *J Inflamm Res*, 8(14), 5183-5
- Luthra M., Bist S., Mishra S., Bharti B., Aggarwal V.& Monga U.(2019).** Evaluation of Association of Allergic Rhinitis with Bronchial Asthma .Available at <https://www.uptodate.com/contents/complementary-alternative-and-integrative-therapies-for-asthma>. Accessed on 5-9-2023
- Mesones CH., Rosales G., Carmona M., Cortes L., Diez S., Donghai M. & Gall X. (2020).** Rural and Urban Asthma: Are they Different? *European respiratory journal*, 56(64), 1310-5.
- Mohamed E., El metwaly A. & Ibrahim A., (2018).** Buteyko Breathing Technique: A golden Cure for Asthma. *American Journal of nursing research*, 6(6), 616-24. Available online at <http://pubs.sciepub.com/ajnr/6/6/32> Published by Science and Education Publishing DOI: 10.12691/ajnr-6-6-32.
- Mohamed Y., Mohamed L. & Elderiny S. (2019).** The Effect of Buteyko Breathing Technique among Patients with Bronchial Asthma: Comparative Research. *International Journal of Midwifery and Nursing Practice* 2019; 2(2): 01-10 DOI: 10.13140/RG.2.2.35603.20007
- Naing L., Nordin R.B., Abdul Rahman H., Naing, Y. T. (2022).** Sample Size Calculation for Prevalence Studies Using Scale x and Scale R calculators. *BMC Medical Research Methodology*, 22(1), 1-8. <https://doi.org/10.1186/s12874-022-01694-7>. Accessed on 2-9-2023
- Negash M., Tsegabrhan H. & Meles T., (2020).** Determinants of Acute Asthma among Adult Asthmatic Patients Visiting Hospitals of Tigray, Ethiopia, case control research, *Asthma res and pract*, 6(1). Available at <https://doi.org/10.1186/s40733-020-00054-w> Accessed on 1-10-2023
- Nelsen, L., Vernon, M., Ortega, H., Cockle, S., Yancey, S., Brusselle, G., Albers, F, Jones, P. (2017).** Evaluation of the psychometric properties of the St George's Respiratory Questionnaire in patients with severe asthma, *National library of medicine*, DOI: 10.1016/j.rmed.2017.04.015.
- O'Neill C. & Dogra S. (2020).** Reducing Anxiety and Anxiety Sensitivity with High-Intensity Interval Training in Adults with Asthma. *J Physical Activity Health* 2020; 17(8):835-9.
- Okab A.K., Hadi A.M., Khasal Q.A., et al., (2022).** Impact of Pharmacist Education Program to Improve Inhalation Technique in Asthmatic Patients at Thi-Qar governorate. *Azerbaijan Med J* 2022; 62(7):1737-55.
- Pereiraa A.M., Vieiraa R.J., Sousa-Pintoa B., Cordeirod C.R., Loureirod F., Regateirof G.H., TabordaBaratai J.K., Bousquetl M.N., Fonsecaa J. (2023).** Asthma Hospitalizations: A call for a National Strategy to Fight Health Inequities. Available at: <https://estudogeral.uc.pt/bitstream/10316/11332/1/1/Asthma%20hospitalizations%20A%20call%20for%20a%20national%20strategy%20to%20>

20fight%20health%20inequities.pdf. Accessed on 20/5/2024.

Rixsi, D. & Alikulova Y., (2022). The Role of Nurses in the Application of Control Diary to Patients with Bronchial Asthma. 4(2), 16-9.

Rogala B., Bozek A. & Gluck J.(2019).Is there a Relationship between Asthma and Diabetes? *J Asthma*, 57(12), 1332-8.

Rogers J. & Revesz A., (2019). Experimental and quasi experimental designs, research gate p133-43 retrived from <https://www.researchgate.net/publication/334250281-experimental-and-quasi-experimental-design>. Accessed on 20-9-2023

Sharma R., Kumar N., Sharma N., Praveen Sh. & Patra A.(2019).The Research to Compare the Effect of Buteyko Breathing Technique and Pursed Lip Breathing in COPD. *Physiotherapy and occupational therapy journal*, 12(2), 103-13.

Shhood S.R., Mahmoud M.H., Ali M. M. (2023). Effectiveness of Implementing Buteyko Breathing Technique on Clinical Outcomes among Patients with Bronchial Asthma. Doctorate thesis, medical Surgical Nursing, Faculty of Nursing. Benha University.

Solet J., Semjen C., Mariotti E., Start Y., Gallay A. Jahaly N. & Filluel L.,(2019).A cross sectional Survey to Estimate Prevalence and Associated Factors of Asthma on Reunion Island, Indian ocean *BMC public health*, 19(1), 663-9

Swathi G., Kumar T., Raghunadh N., Margrett C. (2021). Effectiveness of Buteyko Breathing Technique versus Nadi shuddhi Pranayama to Improve Pulmonary Function in Subjects with Bronchial Asthma. *International Journal of Science and Healthcare Research* Vol.6; Issue: 4; Oct.-Dec. 2021 DOI: <https://doi.org/10.52403/ijshr.20211019>

Tiotiu A., Loan L., Wirth N. (2021). The Impact of Tobacco Smoking on Adult Asthma Outcomes. *International journal of environmental research and public health*, 18(3)992-9

Toppila Salmi S., Lemmeetyinen R., Chanione S. & Karjalainen J. et al., (2021).Risk Factors for Severe Adult – Onset Asthma. *BMC, Pulmonary Medicine*. A multi Factor Approach, 21, p. 214. Retrived at: 10.1186/s12890-021-01578-4

Trivedi M. & Denton E., (2019).Asthma in Children and Adults- What are the Differences and What can they tell us about Asthma? *Front pediatric*, 7, p256. Doi:10.3389/fped.2019.00256.PMID:31294006 ;PMCID:PMC6603154.

Vagedes K., Kuderer S., Ehmann R., Kohl M., Wildhaber J., Rudolf A., Jörres & Vagedes J. (2024). Effect of Buteyko Breathing Technique on Clinical and Functional Parameters in Adult Patients with Asthma: a Randomized, Controlled Research. *European Journal of Medical Research* (2024) 29:42 <https://doi.org/10.1186/s40001-023-01634-1> Accessed on 15-5-2024

World Health Organization (WHO)(2020). Asthma, Prevalence, Mortality Rate of Asthma in Egypt Available at <https://www.who.int/newsroom/q-a-detail/asth>. Accessed on 15-10-2023

Yung J., Fuseini H. & Newcomb D.(2019). Sex Hormone, Gender and Asthma, an Allergy *Asthma Immunology*, 120(5), 488-94

Zhang U. & Huang L. (2021). Characteristics of Older adult Hospitalized Patients with Bronchial Asthma: a retrospective research”, *Allergy, Asthma & Clinical Immunology* available at: <https://aacijournal.biomedcentral.com/articles/10.1186/s13223-021-00628-0>. Accessed on 20/5/2024.

تقنية بوتيكو التنفسية مقارنة بتقنية البراناياما في التحكم بالازمات التنفسية بين مرضى الربو

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يعد الربو مشكلة صحية عالمية خطيرة ولا يزال هناك نقص في الوعي فيما يتعلق بتقنية بوتيكو التنفسية وتقنية براناياما التنفسية لتحقيق المزيد من السيطرة عليها. لذا هدفت الدراسة إلى المقارنة بين تأثير تقنية بيوتيكو التنفسية وتقنية البراناياما في التحكم بالازمات التنفسية بين مرضى الربو. تم استخدام تصميم بحث شبه تجريبي (اختبار قبلي/بعدي) على عينة عرضية مكونة من 60 مريضاً بالغاً يعانون من الربو الشعبي، وتم قبولهم في قسم الصدر في مستشفى جامعة بنها، محافظة القليوبية، مصر. وأظهرت النتائج فرقاً ذو دلالة إحصائية عالية في شدة الربو بين المرضى في مجموعتي باراناياما وبوتيكو، بعد تنفيذ البرنامج. كان هناك فرق ذو دلالة إحصائية عالية بين متوسط الدرجات بين المرضى الذين تمت دراستهم في مجموعتي باراناياما وبوتيكو من حيث التحكم في الازمه التنفسية قبل وبعد تنفيذ البرنامج، وتحديدًا فيما يتعلق بأعراض الربو أثناء النهار. استنتجت الدراسة ان كلا من تقنية بوتيكو التنفسية وتقنية براناياماالتنفسية فعالة في تقليل شدة الازمه التنفسية والتحكم بها ولكن عند المقارنة، كانت تقنية بوتيكو التنفسية هي الأفضل. وقد اوصت الدراسة بأنه ينبغي توفير تطبيق تقنية بوتيكو التنفسية إلى جانب طرق العلاج التقليدية للمرضى الذين يعانون من الربو كوسيلة آمنة وغير مكلفة لتحسين أعراض الربو.