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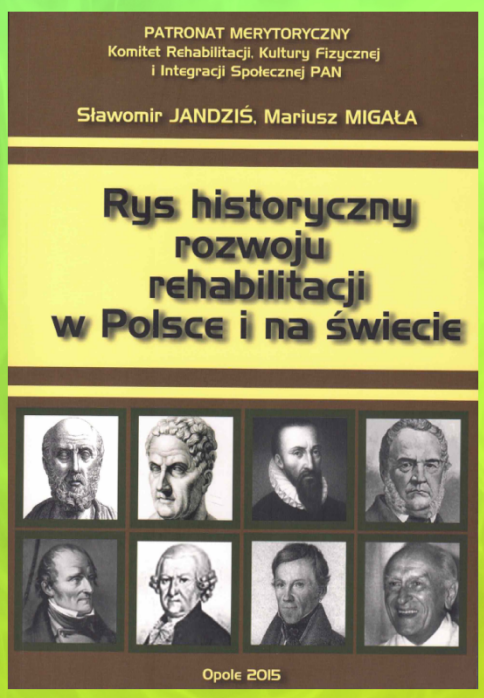

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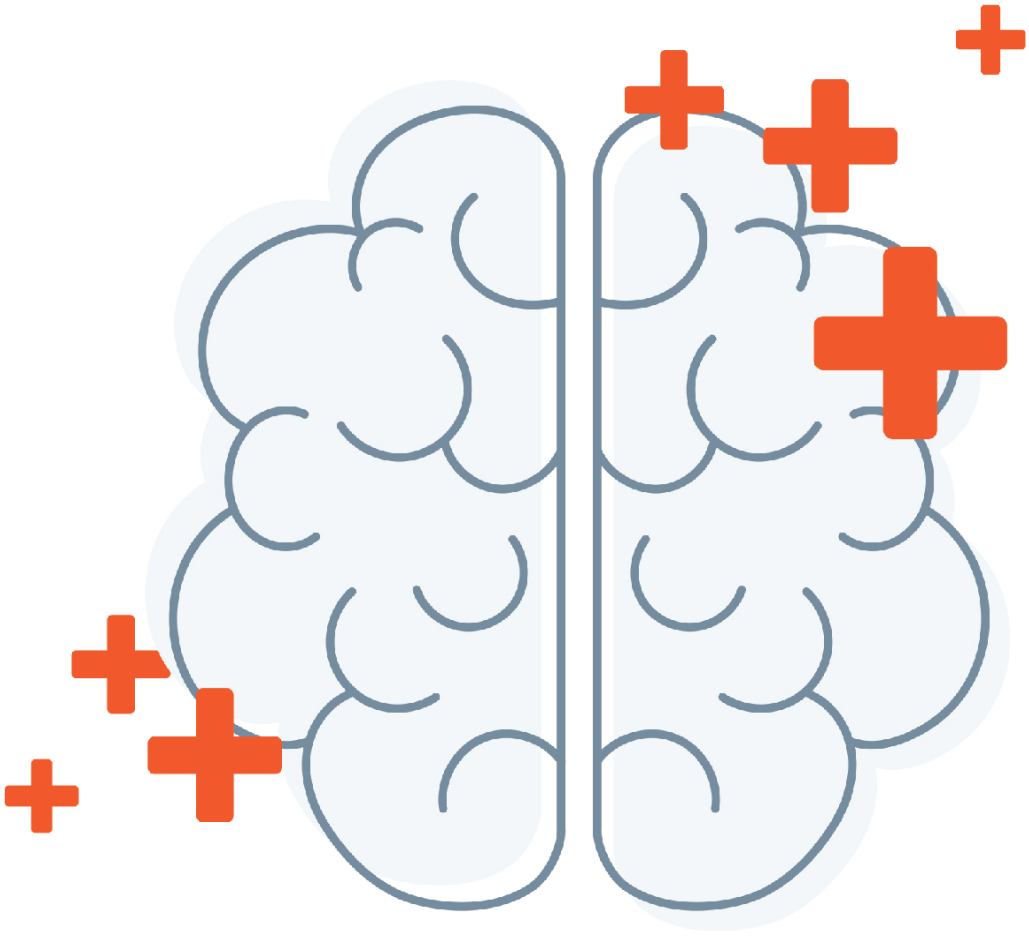

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Effects of Buteyko therapy on dipping of peak expiratory flow rate and quality of life in asthmatic patients among adult and elderly population

Wpływ terapii metodą Butejki na obniżenie szczytowego przepływu wydechowego i jakość życia chorych na astmę

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Abstract

Background. Asthma is a chronic inflammatory illness of the airways characterised by airway obstruction and bronchial hyper-responsiveness that is at least partly reversible. Serial peak expiratory flow measurements are frequently used in the clinical management of asthma to improve diagnose, estimate severity, and screen for provocative variables. When compared to mild persistent asthma, moderate to severe asthma has a lower QOL. Objective. The study's aim is to determine the impact of Buteyko treatment on asthmatic patients' peak expiratory flow rate (Expiratory flow rate) and quality of life. Study design. Pre and post type experimental design. Procedure. Twenty-two mild to moderate asthmatic patients, both men and women, aged 25–60 years, were randomly selected and given a peak expiratory flow metre to measure peak expiratory flow rate in the morning and evening at the same time every day. Basic chest physiotherapy was taught to all of the patients. PEFR decreased in 15 of 22 patients throughout the research period, and Buteyko treatment was administered twice daily for 6 weeks. Outcome measures. Peak Expiratory Flow Rate and Questionnaire on Shortness of Breath. Results. With Buteyko therapy, asthmatic patients' PEFR and Shortness of Breath questionnaires improved statistically significantly ($p < 0.05$). Conclusion. The study found that Buteyko treatment had a substantial impact on peak expiratory flow rate lowering and asthmatic patients' quality of life.

Keywords

dipping, Buteyko therapy, quality of life, bronchial asthma, peak expiratory flow rate, shortness of breath questionnaire

Streszczenie

Wprowadzenie. Astma jest przewlekłą chorobą zapalną dróg oddechowych charakteryzującą się niedrożnością dróg oddechowych i nadreaktywnością oskrzeli, która jest przynajmniej częściowo odwracalna. W klinicznym leczeniu astmy często stosuje się seryjne pomiary szczytowego przepływu wydechowego w celu poprawy diagnozy, oszacowania nasilenia i odszukania zmiennych powodujących występowanie objawów. W porównaniu z łagodną astmą przewlekłą, astma umiarkowana i ciężka charakteryzują się niższą jakością życia pacjentów (QOL). Cel. Celem badania jest określenie wpływu terapii metodą Butejki na szczytowy przepływ wydechowy (przepływ wydechowy) i jakość życia pacjentów z astmą. Projekt badania. Projekt badania polegał na weryfikacji wyników przed i po zastosowaniu terapii. Procedura. Dwudziestu dwóch pacjentów z łagodną lub umiarkowaną astmą, mężczyzn i kobiet, w wieku 25–60 lat, zostało losowo wybranych i otrzymało przepływomierz do pomiaru szczytowego przepływu wydechowego rano i wieczorem o tej samej porze każdego dnia. Wszystkim pacjentom zlecono wykonywanie podstawowej fizjoterapii klatki piersiowej. PEFR zmniejszył się u 15 z 22 pacjentów w całym okresie badań. Terapię metodą Butejki prowadzono dwa razy dziennie przez 6 tygodni. Miary wyników. Szczytowy przepływ wydechowy i kwestionariusz dotyczący duszności. Wyniki. Przy zastosowaniu terapii metodą Butejki, wyniki kwestionariusza PEFR i kwestionariusza dotyczącego duszności u pacjentów z astmą poprawiły się w stopniu istotnym statystycznie ($p < 0,05$). Wniosek. Badanie wykazało, że terapia metodą Butejki miała znaczący wpływ na obniżenie szczytowego przepływu wydechowego oraz na jakość życia pacjentów z astmą.

Słowa kluczowe

zanurzanie, terapia Butejki, jakość życia, astma oskrzelowa, szczytowy przepływ wydechowy, kwestionariusz dotyczący duszności

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Introduction

Asthma is the one of the common pulmonary disorders occurs all over the world, with excessive health complications for human beings, it includes critical cases and various leads to various impairments. It is at 16th rank for the factor of disability and For the burden of diseases it holds 28th rank [1]. More than 20 crores people have asthma all over the world, By prediction at 2025 more than 5 crores could also get affected [2]. In India's 131 crore people, statistically 2% (adults) and 6% (children) have asthma. In 1.5–2 crore asthma patients, the count of 1 patient in every 10 patients will be there in India [3].

Asthma is a bronchial allergic inflammatory condition. This key component of asthma includes disease diagnosis, severity management, and possible disease prevention. Neutrophils (especially in sudden-onset, life-threatening asthma exacerbations; occupational asthma; and smokers), eosinophils, lymphocytes, mastocyte activation, and somatic-cell destruction are immunological histopathologic indicators of asthma [4].

Airway hyperresponsiveness, illness chronicity, respiratory symptoms, and airflow limitation are all indications of airway inflammation. Persistent changes in airway structure, such as smooth muscle hypertrophy, mucus hypersecretion, and damage to epithelial cells and submucosal layers, occur in certain patients. Wheezing (87.5%), cough (81.3%), tightness of the chest (68.8%), and tiredness (56.3%) were the most often reported symptoms in the adult population [5].

Global Initiative classification of Asthma GINA severity classification by clinical characteristics prior to treatment: Exacerbations are more common with severe persistent symptoms, and nighttime asthma symptoms often limit physical activities. Exacerbations impacting activity and sleep happen once a week. Exacerbations can disrupt activities and sleep, and nocturnal symptoms emerge every two months. Once a week, with brief exacerbations, intermittent symptoms occur; nocturnal symptoms occur fewer than twice a month [6].

PEFR measures the condition and strength of respiratory muscles, as well as the amount of airflow restriction in bigger airways. PEFR is a measurement of regular deviation/variation in asthma sufferers and the general population. The fluctuation in peak expiratory flow that occurs during the day is called diurnal variation (24 hours). It depicts the variance in peak expiratory flow announced at different times on the same day; it is recommended to record the PEFR at an equivalent timepoint to match the PEFR between patients [7].

PEFR has a wide range of values and can be used to estimate bronchial tone, making it a useful indicator in the diagnosis of asthma. This information could also be linked to asthma attacks that occur late at night or early in the morning [8]. The daily activities of socially or physically active asthmatic individuals are generally linked to the evening decline. Medical practitioners can provide their patients suitable counsel and monitor its success using the peak expiratory flow report [9].

The Buteyko Method was founded by Dr. Konstantin Buteyko. He described how hyperventilation and poor metabolic activity are caused by bronchospasm in asthma and CO_2 deficit in alveolar air. The Buteyko Breathing Technique (BBT) is a Form of Alternative Therapy for people who are diagnosed that has recently gained popularity. Its main goal is to reverse persistent hyperventilation. Not only can the Buteyko method help with asthma, but it also helps with other hyperventilation-related disorders and obstructive lung conditions [10].

Asthma has a substantial influence on the quality of life of patients and their families (QOL). The key clinical asthma outcome measure is Quality of Life (QOL), which is an essential component for patients when assessing therapeutic regimens. The influence of asthma on QOL is likely to differ in terms of features and degree based on a variety of patient factors, including age. When assessing moderate and severe asthma to mild asthma, the quality of life in moderate and severe asthma deteriorates; yet, objective measures of disease severity cannot accurately assess the patient's personal burden of illness [11].

Materials and Methods

Study design was Experimental design and pre and post type with Convenient sampling for 6 weeks duration in setting of Department of Pulmonary Medicine, SRM Medical College Hospital and Research Centre, Kattankulathur, St.Lukes hospital, Nazareth. Criteria for inclusion 25–60 years, Mild and moderate asthma (GINA classification) Patients those who have dipping in diurnal variation. 15 participants were included in the study. Outcome measure of the study was Peak Expiratory Flow rate and Shortness of Breath Questionnaire.

The study's protocol was Conveyed to the patients. The Institutional Ethical Committee gave their approval to the project. All of the patients gave their informed consent. Prior to the trial, 15 asthmatic patients who met the inclusion criteria were given a peak expiratory flow metre to measure their peak expiratory flow rate in the morning and evening at the same time each day. All the patients were taught conventional chest physiotherapy. Conventional chest physiotherapy included purse lip breathing exercise, relaxed positions, airway clearance techniques.

Each patient was taught Buteyko breathing technique intensively in the first week for 4 alternate days then followed by 2 sessions per week for 5 weeks. The therapy took place during the morning session, with a two-hour interval after eating. The technique was done by each of the 15 patients at home twice a day (in the morning and evening), and the exercise diary was used to track their progress.

During the six weeks of therapy, the patients' peak expiratory flow rate was monitored twice a day (morning and evening). Patients were given a shortness of breath questionnaire at the start and end of the sixth week.

The Buteyko Therapy Technique

Step1: *The "Control pause":*

The patient was asked to sit straight in a backrest chair, shoulders relaxed. Before taking their control pause, the patient was told not to modify their breathing and to breathe in and out for 3 seconds. The patient was instructed to hold their nose during exhalation to prevent air from entering the respiratory tract. The therapist kept track of how long the patient could hold their breath without feeling uncomfortable. The patient was told to use a stopwatch or a clock at home to count the seconds. They had to hold their breath until the first breath was taken after the discomfort became apparent, then release their hand from their nose to count the seconds. The patient was told not to hold their breath for long periods of time because this could cause them to take a huge breath after the Control pause measures.

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Step 2: *"Shallow breathing"*
Patient position: Sit up straight.
The patient was instructed to place his finger horizontally under his nose to measure the air pressure flowing into his nostrils. To feel the airflow, the finger is placed slightly above the top lip, near to the nose. The patient was instructed to inhale deeply enough to completely fill their nostrils. With each breath, the patient was instructed to take in a small amount of air. The patient was instructed to exhale deeply and gently over their finger any excess warm air they felt. The patient was also told to focus on their breathing to lessen the amount of heated air.

Step 3: *Putting it together of Shallow breathing and control pause:*
The patient was instructed to do 4 minutes of shallow breathing, followed by 2 minutes of relaxed regular breathing and a Control pause (control pause is holding of breath accordance to the capacity of the patient). This cycle was repeated 3 times.

Performance of Peak Expiratory Flow meter and reading
Each patient was evaluated when sitting up straight. The mouthpiece of the carton was connected to that of the peak expiratory flow metre. The pointer was reset to zero, and the patient was advised to hold the peak flow metre horizontally and away from the pointer. The patient was instructed to inhale deeply and firmly shut his or her lips around the carton mouthpiece. The patient was instructed to blow as forcefully as possible, as though blowing out candles. The patient was reminded that the speed of his or her blow was being assessed. The cursor was reset to zero after taking the reading (Figure. 1). The highest reading was recorded on the dipping chart after each subject repeated this three times. The post-test PEFR and Shortness of Breath Questionnaire were examined after six weeks of Buteyko Therapy [10, 18, 19].

Figure 1. Patient blowing peak expiratory flow meter

Results

The data collected was tabulated and analysed using the statistical package for social science (SPSS) version 25 for Windows. Normality distribution of data with Shapiro Wilk test was done with level of significance kept as 0.05. Since the PEFR showed Non-normal distribution, the statistical tool used was the Wilcoxon test (Non-parametric test) for the PEFR dipping analysis. Whereas Shortness of breath showed Normal distribution, so paired t-test (Parametric test) was used for analysis of the comparison between the pre and post-test values of the Shortness of breath questionnaire.
Table 1 shows that the mean age of 15 samples (11 men, 4 women) is 41 years, with mean BMI of 27.9.
The mean Pre-test monitoring PEFR was 213.3 L/Min, mean Pre-test Buteyko therapy PEFR was 212.3 L/Min and mean Post-test Buteyko therapy PEFR was 215.3 L/Min.
The mean Pre-test SOBQ was 10.5 and the mean Post-test SOBQ was 6.3

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Table 1. Demographic data of the interventional group

S.No.	No. of samples	Maximum	Minimum	Mean
Age	15	53	29	36.5
BMI	15	32.3	23.6	29.12
Pre-test PEFR (l/min) Buteyko therapy	15	250	185	212.3
Post test PEFR (l/min) buteyko therapy	15	250	190	215.3
monitoring PEFR (l/min)	15	260	170	213.3
Pre-test SOBQ	15	19	8	10.5
Post test SOBQ	15	13	3	6.3

Gender: Men = 11 (73.3%), Women = 4 (26.7%)

Table 2 shows the statistically significant of p = 0.03 i.e (p < 0.05).
Table 3 shows that there is statistically significant (p < 0.05) reduction of the mean Pre-test SOBQ of 10.5 (± 3.52) to Post-test SOBQ of 6.3 (± 2.43).

Table 2. Peak Expiratory Flow Rate (dipping) shows median, percentiles, z-value and p-value

Interventional Group	Median	Percentiles	z-value	p-value
Pre test (dipping week) PEFR (n = 15)	210	250	−2.132	0.003
Post test PEFR (n = 15)	210	250		

p < 0.05

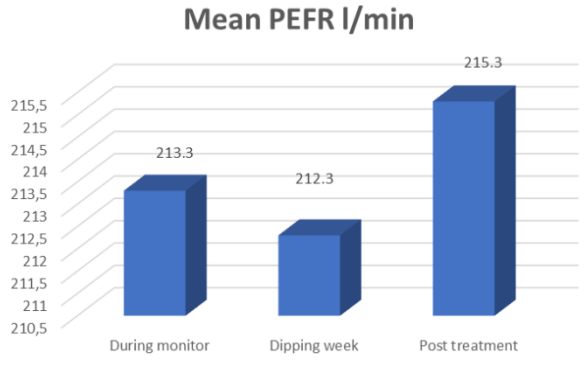

Figure 2. Variation in mean of monitoring PEFR, dipping week PEFR, post treatment PEFR (l/min)

Table 3. The mean pre and post test values of Shortness of Breath Questionnaire

Interventional Group	Mean	Standard deviation	t-value	p-value
Pretest SOBQ (n = 15)	10.5	3.52	8.573	0.000
Post test SOBQ (n = 15)	6.3	2.43		

p < 0.05

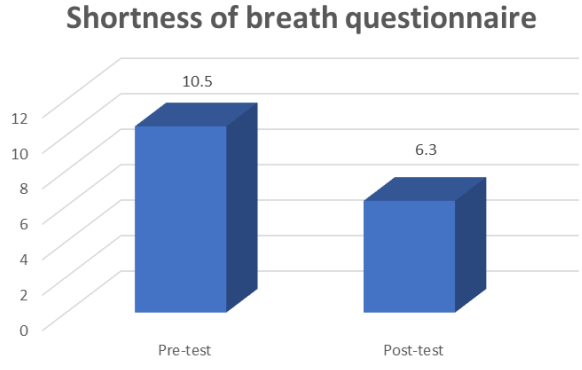

Figure 3. Variation in mean of pre-test of Shortness of Breath Questionnaire and post-test of shortness of breath

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Discussion

The study was done to find out the effectiveness of Buteyko therapy on peak expiratory flow rate and quality of life in asthmatic patients. The results show that there is significant effect in the Buteyko therapy in asthmatic patients with dipping outcomes.

The monitoring of the patients was 6 months to meet the inclusion criteria of dipping. V. Bellia et al. stated that PEFR monitoring was highly recommended for aged asthmatic patients (25–74) and they were the risk factors for the morning dipping [9]. 22 patients, consented to be a part of the study and the procedure was explained to the patients. Initially, all of the patients were instructed to measure their Peak Expiratory Flow Rate (PEFR) at the same time every day in the morning and evening. As the PEFR was monitored, totally 15 patients exhibited dipping of PEFR, Some in the first three weeks of the monitoring and some showed dipping in the fifth week of the monitoring. Mean value is taken for monitoring PEFR (213.3) and the dipping week PEFR (212.3). The 15 patients who showed dipping of PEFR were taught Buteyko therapy as a 6 weeks protocol and simultaneously monitoring PEFR. At the end of 6 weeks, the PEFR obtained from the patients was taken as a post treatment mean PEFR which was (215.3). The Average PEFR for a particular day was calculated by getting the mean value of morning and evening PEFR of that particular day. The Pre-test PEFR was calculated by taking the average PEFR on the week of dipping (212.3). The Post-test PEFR was calculated by taking the average PEFR on the sixth week of Buteyko therapy. This study shows that the PEFR improves from the Pre-test to Post-test values.

Debidas Ray et al. gives the normative values for Peak Expiratory Flow for Tamil Nadu population males age of 25–55 ranges from (360–470) L/min and also females age of 25-55 ranges from (320–306) L/Min for healthy adults. In this study observed PEFR is lesser than the normal reference values [20].

The results of this study go in hand with Z M Hassan et al. who stated that the Buteyko therapy decreased the symptoms of asthma and significant improvement in PEFR [10].

Bowler et al. found a substantial improvement in PEFR in individuals who were given Buteyko breathing exercises, which is comparable to the current study's findings [21] This study proves SOBQ also showed improvement from Pre-test to Post-test values for Quality of life.

H. C. Prescott et al. stated that the Quality of life is increased in the pulmonary rehabilitation in asthmatic patients which is measured by the Shortness of Breath Questionnaire [22]. In our study the Buteyko therapy performed for 2 times a day improves the Quality of life which was measured through SOBQ.

V Prem et al. states the importance of the Buteyko therapy on quality of life and asthma control than in the pranayama [17].

Jeremy M et al. stated that the dippers both have no significant changes in mean Peak Expiratory Flow Rate by introducing corticosteroid by irregular intervals [23]. Our study have the outcome of reduction of dipping by Buteyko therapy in regular intervals.

The asthmatic circadian rhythm follows the same pattern, with PEFR decreasing in the morning and peaking in the afternoon, but the PEFR variation from the mean value is much higher than in normal people [13]. Because the PEFR measure is fully effort-dependent, there are a lot of intra-subject variability when it comes to population diagnosis and asthma clinical outcomes [14].

Due to the bronchospasm of the bronchial wall the changes occurred in the diurnal variation in PEFR outcomes in that the dipping of the variation is early indication for asthmatic attack [8]. The cause of asthmatic bronchospasm (airway narrowing) is uncertain. Although dosages of 2 agonists had no effect on bronchial wall contraction, oedema of the airways tract caused by plasma exudation from leaky post-capillary venules might be a role. Patients who died from sudden-onset asthma episodes had neutrophils rather than eosinophils infiltrate their airways, suggesting that neutrophils arrive first in every asthma attack [17].

Washes out of CO_2 is another name for hyperventilation. These are around 120 L in size and height. Alveolar cells store around 100 mL of CO_2. It is determined by CO_2 partial pressure and its physical solution. A common complication of severe asthma is hyperventilation, which results in an abnormally low $PaCO_2$ [15]. The Buteyko technique involves shallow breathing via the nose to stabilise the breathing pattern. This changes the body's gas exchange ratio, which relieves symptoms of obstructive lung disease [10]. Deep breathing removes an excessive quantity of CO_2 from the body, resulting in lower CO_2 levels in the lungs, blood, and tissue cells. Important things to keep in mind: A patient must conduct deep breathing in order to receive the effect of the command: "Take as deep a breath as you can!" Deep breathing causes pathological symptoms in a matter of seconds, whereas reducing the depth of breathing removes them just as quickly. The reduction of breathing depth to bring the individual back to normal respiratory function is the preventative and therapy concept [16].

All the 15 patients were received Buteyko therapy did not get any acute respiratory distress throughout 6 weeks therapy and showed improvement in PEFR and Quality of Life. Buteyko therapy has beneficial effect on reversing the dipping of PEFR and thereby improves the Quality of Life in Asthmatic patients.

Conclusion

The study showed that Buteyko therapy had a significant effect on peak expiratory flow rate and asthmatic patients' quality of life.

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Piśmiennictwo/ References

1. Dharmage SC, Perret J, Custovic A. Epidemiology of asthma in children and adults. Frontiers in pediatrics. 2019;7:246.
2. GBD 2015 Chronic Respiratory Disease Collaborators. Global, regional, and national deaths, prevalence, disability-adjusted life years, and years lived with disability for chronic obstructive pulmonary disease and asthma, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. The Lancet. Respiratory Medicine. 2017 Sep;5(9):691.
3. Bhalla K, Nehra D, Nanda S, Verma R, Gupta A, Mehra S. Prevalence of bronchial asthma and its associated risk factors in school-going adolescents in Tier-III North Indian City. Journal of family medicine and primary care. 2018 Nov;7(6):1452.
4. Education NA, Program P, on the Diagnosis TE, of Asthma M. Section 2, Definition, pathophysiology and pathogenesis of asthma, and natural history of asthma. InExpert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma 2007 Aug. National Heart, Lung, and Blood Institute (US).
5. Globe G, Martin M, Schatz M, Wiklund I, Lin J, von Maltzahn R, Mattera MS. Symptoms and markers of symptom severity in asthma--content validity of the asthma symptom diary. Health Qual Life Outcomes. 2015 Feb 13;13:21. doi: 10.1186/s12955-015-0217-5. PMID: 25879643; PMCID: PMC4336744.
6. Kroegel C. Global Initiative for Asthma (GINA) guidelines: 15 years of application. Expert review of clinical immunology. 2009 May 1;5(3):239-49.
7. Jayapal J. A study of diurnal variation in peak expiratory flow rates in healthy adult female subjects in South India. CHRISMED Journal of Health and Research. 2014 Jul 1;1(3):184.
8. Jena SK, Mohanty A, Mania RN, Pal A. Diurnal variation of peak expiratory flow rate in healthy young adults: A gender-based study. Journal of Medical Society. 2017 May 1;31(2):104.
9. Kurashima K, Kato T, Takayanagi N, Saito H, Tokunaga D, Ubukata M, Yanagisawa T, Sugita Y. Evening Dip of Peak Expiratory Flow in Patients with Asthma. Allergology International. 2005 Jan 1;54(2):325-9.
10. Hassan ZM, Riad NM, Ahmed FH. Effect of Buteyko breathing technique on patients with bronchial asthma. Egyptian Journal of Chest Diseases and Tuberculosis. 2012 Oct 1;61(4):235-41.
11. Hossny E, Caraballo L, Casale T, El-Gamal Y, Rosenwasser L. Severe asthma and quality of life. World Allergy Organ J. 2017 Aug 21;10(1):28. doi: 10.1186/s40413-017-0159-y. PMID: 28855973; PMCID: PMC5563897.
12. Van Keimpema AR, Ariaansz M, Tamminga JJ, Nauta JJ, Postmus PE. Nocturnal waking and morning dip of peak expiratory flow in clinically stable asthma patients during treatment. Occurrence and patient characteristics. Respiration 1997;64:29-34
13. Dikshit MB, Raje S, Agrawal MJ. Lung functions with spirometry: An Indian perspective – I. Peak expiratory flow rates. Indian J Physiol Pharmacol 2005;49:8-18.
14. Medarov BI, Pavlov VA, Rossoff L. Diurnal variations in human pulmonary function. Int J Clin Exp Med 2008;1:267-73.
15. Ayres Jg,miles Jf,Barnes PJ , brittle asthma.thorax 1998;53:315-321.
16. Basic principles of buteyko therapy ;2005 – K.P Buteyko.
17. Prem V, Sahoo RC, Adhikari P. Comparison of the effects of Buteyko and pranayama breathing techniques on quality of life in patients with asthma–a randomized controlled trial. Clinical rehabilitation. 2013 Feb;27(2):133-41.
18. Eichenhorn MS, Beauchamp RK, Harper PA, Ward JC. An assessment of three portable peak flow meters. Chest. 1982 Sep 1;82(3):306-9.
19. Dekker FW, Schrier AC, Sterk PJ, Dijkman JH. Validity of peak expiratory flow measurement in assessing reversibility of airflow obstruction. Thorax. 1992 Mar 1;47(3):162-6.
20. Eichenhorn MS, Beauchamp RK, Harper PA, Ward JC. An assessment of three portable peak flow meters. Chest. 1982 Sep 1;82(3):306-9.
21. Eakin EG, Resnikoff PM, Prewitt LM, Ries AL, Kaplan RM. Validation of a new dyspnea measure: the UCSD Shortness of Breath Questionnaire. Chest. 1998 Mar 1;113(3):619-24.
22. Dekker FW, Schrier AC, Sterk PJ, Dijkman JH. Validity of peak expiratory flow measurement in assessing reversibility of airflow obstruction. Thorax. 1992 Mar 1;47(3):162-6.
23. Prescott H C, Compalati E, Schiappoli M, Senna G. Complementary and alternative medicine for the treatment and diagnosis of asthma and allergic diseases. Monaldi archives for chest disease. 2005 Mar 30;63(1).
24. Bowler MB, Raje S, Agrawal MJ. Lung functions with spirometry: An Indian perspective – I. Peak expiratory flow rates. Indian J Physiol Pharmacol 2005;49:8-18.

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