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Assessing the Impact of Breathing Techniques on Asthma Symptoms and Quality of Life

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Abstract

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Asthma, a chronic respiratory condition affecting 1%-18% of the global population, leads to significant morbidity, healthcare costs, and around 180,000 deaths annually. Despite advances in pharmacological treatments, many individuals still experience persistent symptoms, reducing their quality of life. This study aims to assess the impact of breathing techniques as adjunct therapy on asthma-related quality of life. A randomized controlled trial was conducted with 80 participants, divided into an intervention group (40) and a control group (40). The ACT and AQLQ were used to evaluate asthma control and quality of life. Following two weeks of training in diaphragmatic and pursed-lip breathing, data were analyzed using SPSS with paired and independent t-tests. Results showed a slight improvement in the intervention group, with AQLQ scores increasing from 3.25 to 3.36 ($p = 0.002$). However, the control group had better asthma-related quality of life, with higher mean AQLQ scores (3.60 vs. 3.13) and a greater improvement in post-test scores. More participants in the control group reported minimal or no impairment. While breathing techniques slightly improved the quality of life in the intervention group, they were less effective than the overall improvements in the control group. Further research is needed to evaluate the effectiveness of breathing techniques compared to other interventions.

Keywords: Asthma, Diaphragmatic breathing, Pursed-lip breathing, Quality of life, Randomized controlled trial

Declaration: There is no conflict of interest, and the research is conducted as per the ethics of research conduct.

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Introduction

Asthma is a chronic inflammatory respiratory disease affecting approximately 1%-18% of the global population and causing around 180,000 deaths each year (Abbafati et al., 2020; GINA, 2018). It is characterized by airway inflammation, structural airway changes, and recurrent symptoms such as wheezing, coughing, chest tightness, and breathlessness (Brightling et al., 2012). These symptoms are commonly triggered by allergens, smoke, physical activity, and certain medications. Diagnosis typically involves medical history, physical examination, and lung function tests such as spirometry and peak expiratory flow measurement to determine severity and guide treatment. Asthma includes several variants, such as allergic, non-allergic, and late-onset asthma, and remains a major public health concern as many individuals continue to experience persistent symptoms despite advances in pharmacological management (Veidal et al., 2017). In addition, irregular breathing patterns, including hyperventilation syndrome, are reported in a considerable proportion of asthma patients and may worsen dyspnea, often influenced by psychological factors (Boulding et al., 2016; Courtney et al., 2019). Because of this, personalized asthma care that addresses both physiological and psychological components is increasingly emphasized (Braido, 2013; Lavoie et al., 2005).

Although bronchodilators and corticosteroids are effective for many patients, a substantial number continue to report poor symptom control and reduced quality of life, indicating the need for additional supportive strategies (Beasley et al., 2016; GINA, 2018). Breathing techniques, such as diaphragmatic breathing and pursed-lip breathing, have been suggested as low-cost, non-pharmacological adjuncts that may improve symptoms, lung function, and overall well-being (Bruton & Lewith, 2005; James & Lyttle, 2016). However, existing research on their role in asthma care is limited by small sample sizes, inconsistent methods, and unclear physiological mechanisms, leading to hesitation among healthcare providers regarding their routine use (Braido, 2013; Courtney, 2017). The lack of strong, consistent evidence on safety, effectiveness, and cost-benefit limits their integration into standard asthma management.

Therefore, there is a growing interest in exploring complementary therapies, such as breathing techniques, to enhance asthma management. Breathing techniques are generally low-cost interventions that can be easily integrated into existing asthma care protocols. Assessing their efficacy and cost-effectiveness may have implications for healthcare resource allocation and health policy decisions. In light of these considerations, this study sought to contribute to the evidence base on breathing techniques in asthma management, with the ultimate goal of improving outcomes and quality of life for individuals living with asthma. This study evaluates the influence of breathing techniques on asthma-related quality of life.

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Methodology

This study employed a randomized controlled trial, where participants were randomly assigned to either the intervention or control group to assess the effectiveness of breathing techniques in asthma management. About 80 participants were taken where 40 participants were placed in control group and 40 participants in intervention group. A sample size of 40 participants per group is considered sufficient to detect clinically relevant differences in asthma symptoms, quality of life, and lung function outcomes between the intervention and control groups. Previous research studies with similar objectives have utilized comparable sample sizes (K & Sharma, 2018; Prasanna et al., 2015), thereby ensuring the feasibility and validity of the study. The intervention group received two weeks of training in breathing techniques, including diaphragmatic breathing and pursed-lip breathing, conducted by certified respiratory therapists or physiotherapists, while the control group received usual care.

The data was collected using a survey questionnaire administered to participants in both the control and intervention groups. Asthma Control Test (ACT) was used as a self-administered tool to assess the level of asthma control based on symptom frequency and medication use. ACT is developed by Nathan et al., (2004) and validated by Schatz et al., (2006) and internal reliability ranging from 0.77-0.85 (Schatz et al., 2006). It is a simple 5-question tool that is self-administered by the patient. If the total score is 20-25, it indicates well-controlled asthma, 16-19 suggest poor control, and 5-15 reflect very poorly controlled asthma, requiring medical intervention. Asthma Quality of Life Questionnaire (AQLQ) was used to measure the impact of asthma on various aspects of quality of life, including physical, emotional, and social functioning. AQLQ is a standard questionnaire developed by Juniper et al., (1992), validated by Juniper et al., (1999) and internal consistency ranging from 0.80 to 0.96 (Gupchup et al., 1997). It includes 32 item questions scored on a 7-point Likert scale (1 = severe impairment, 7 = no impairment). An overall AQLQ score is obtained by averaging all items. AQLQ scores of 1.0-2.0 indicates severe impairment; 2.0-3.5 reflects moderate impairment; 3.6-5.0 suggests mild impairment; and 5.0-7.0 indicates minimal impairment with little to no effect on quality of life. The intervention group received 2 weeks of training in breathing techniques, including diaphragmatic and pursed-lip breathing, led by certified respiratory therapists or physiotherapists. Research staff administered surveys to participants at baseline and after 2 weeks, with assistance provided if necessary to ensure accurate responses.

Once the data were collected, all responses undergo scan to ensure they are accurate, comprehensive, and internally coherent, thereby identifying and rectifying any discrepancies or omissions. Subsequently, the data was input into the computer for processing. Statistical analysis was conducted using specialized tools, particularly SPSS, to scrutinize the data. The criteria for determining statistical significance was established with a p-value threshold of 0.05 and a confidence interval of 95%. Quantitative data was analyzed using appropriate statistical methods, such as paired t-tests and independent t-test, to compare outcomes between the intervention and control groups.

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Results

Demographic profile of the respondents

Table 1 : Respondent's profile

Characteristics		Group			
		Intervention		Control	
		N	%	N	%
Age Group (years)	18-35	15	18.8	11	13.8
	36-45	11	13.8	12	15.0
	46 above	14	17.5	17	21.3
Gender	Male	21	26.3	26	32.5
	Female	19	23.8	14	17.5
Education level	Illiterate	4	5.0	2	2.5
	Only read and write	4	5.0	11	13.8
	Basic level [class 1-8]	11	13.8	1	1.3
	Secondary level [class 9-12]	12	15.0	17	21.3
	Bachelor	7	8.8	7	8.8
	Masters and above	2	2.5	2	2.5
Occupation	Unemployed	8	10.0	25	31.3
	Private employee	4	5.0	6	7.5
	Government employee	3	3.8	0	0.0
	Self-employed/ Entrepreneur	8	10.0	1	1.3
	Homemaker/ Housewife	7	8.8	5	6.3
	Retired	2	2.5	0	0.0
	Students	8	10.0	3	3.8
Diagnosed with asthma (Years)	1-10	25	31.3	13	16.3
	11-20	9	11.3	13	16.3
	21 above	6	7.5	14	17.5

Table 1 presents the demographic and clinical characteristics of 80 respondents (Intervention = 40, Control = 40). The Intervention group was slightly younger, with 18.8% aged 18–35 years compared to 13.8% in the Control group, and had more females (23.8% vs. 17.5%), while the Control group had more males (32.5% vs. 26.3%) and a higher proportion aged ≥46 years (21.3% vs. 17.5%). Education levels showed the Intervention group had more respondents with basic education (13.8% vs. 1.3%), whereas secondary education was higher in the Control group (21.3% vs. 15.0%), with equal proportions holding bachelor's (8.8%) and master's degrees (2.5%). Unemployment was higher in the Control group (31.3% vs. 10.0%), while the Intervention group included government employees (3.8%), self-employed (10.0%), and students (10.0%). Regarding asthma duration, more Control participants had ≥21 years since diagnosis (17.5% vs. 7.5%), while 1–10 years was more common in the Intervention group (31.3% vs. 16.3%), and both groups were equal for 11–20 years (16.3%).

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Effectiveness of breathing techniques as adjunct therapy in improving asthma symptoms

Table 2 : Pre-test and Posttest score of ACT

ACT Score		Group			
		Intervention		Control	
		N	%	N	%
Pre Test Score	Well-controlled asthma	24	30.0	11	13.8
	Not well-controlled asthma.	8	10.0	17	21.3
	Very poorly controlled asthma.	8	10.0	12	15.0
Post Test score	Well-controlled asthma	20	25.0	10	12.5
	Not well-controlled asthma.	12	15.0	17	21.3
	Very poorly controlled asthma.	8	10.0	13	16.3

The table compares pre-test and post-test ACT scores between the Intervention and Control groups to assess asthma symptom control. During pre-test, the Intervention group had a higher proportion of participants in the “Well-Controlled” category (30.0% vs. 13.8% in Control), while the Control group had more in the “Very Poorly Controlled” category (21.3% vs. 10.0% in Intervention); both groups had similar proportions in the intermediate category (10.0% vs. 15.0%). At post-test, the Intervention group showed a slight decrease in well-controlled cases (25.0%) and an increase in the intermediate category (from 10.0% to 15.0%), whereas the Control group remained relatively stable in well-controlled (12.5%) and very poorly controlled categories (21.3%) with a minor increase in the intermediate group (15.0% to 16.3%). Overall, the Intervention group had a marginally better profile at both time points, but the slight decrease in well-controlled cases post-intervention suggests that breathing techniques alone may not produce substantial improvements in asthma symptom control, and further analysis is needed to evaluate factors such as intervention duration and adherence.

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Influence of breathing techniques on asthma-related quality of life.

Table 3 : Pre-test and Posttest score of AQLQ

AQLQ		Group			
		Intervention		Control	
		N	%	N	%
Pre Test Score	Severe impairment	4	5.0	0	0.0
	Moderate impairment	4	5.0	0	0.0
	Mild impairment	22	27.5	18	22.5
	No impairment or minimal impairment	10	12.5	22	27.5
Post Test Score	Severe impairment	1	1.3	0	0.0
	Moderate impairment	5	6.3	0	0.0
	Mild impairment	22	27.5	16	20.0
	No impairment or minimal impairment	12	15.0	24	30.0

Table 3 illustrates the effect of breathing techniques on AQLQ scores for the Intervention and Control groups. In the Intervention group, pre-test results showed 5.0% of participants with severe impairment, 5.0% with moderate impairment, 27.5% with mild impairment, and 12.5% with no/minimal impairment. Post-intervention, severe impairment decreased to 1.3%, moderate impairment to 6.3%, mild impairment remained at 27.5%, and no/minimal impairment increased to 15.0%, indicating improved asthma-related quality of life. The Control group had no severe or moderate impairment at baseline, with 22.5% reporting mild impairment and 27.5% no/minimal impairment. Post-test, no/minimal impairment increased to 30.0%, and mild impairment slightly decreased to 20.0%, suggesting modest improvements likely due to natural variation or placebo effects. Overall, the Intervention group demonstrated more pronounced improvements, particularly in reducing severe and moderate impairments, indicating that breathing techniques positively influence asthma-related quality of life, though further research is needed to isolate the intervention's specific effect.

Comparison of the outcomes between the intervention group and the control group

Table 4: Independent Samples Test of AQLQ between the intervention group and the control group

Group Statistics					
	Group	N	Mean	Std. Deviation	Std. Error Mean
AQLQ Score	Intervention	40	3.1250	0.72280	0.11428
	Control	40	3.6000	0.49614	0.07845

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Independent Samples Test										
Levene's Test for Equality of Variances		t-test for Equality of Means								
		F	Sig.	t	df	Sig. (2-tailed)	MD *	Std. ERD*	95 Confidence Interval of the Difference	
									Lower	Upper
AQLQ Score	Equal variances assumed	0.325	0.571	-3.427	78	0.001	-0.47500	0.13862	-0.75097	-0.19903
	Equal variances not assumed			-3.427	69.074	0.001	-0.47500	0.13862	-0.75153	-0.19847

*ERD= Error difference, MD= Mean difference

Table 4 presents the Independent Samples t-test comparing AQLQ scores between the Intervention and Control groups to assess the effect of breathing techniques on asthma-related quality of life. The Intervention group (N = 40) had a mean score of 3.1250 (SD = 0.7228), while the Control group (N = 40) had a higher mean of 3.6000 (SD = 0.4961). Levene's test indicated equal variances (F = 0.325, p = 0.571), allowing standard t-test use. The t-test revealed a statistically significant difference between groups (t = -3.427, df = 78, p = 0.001), with a mean difference of -0.475 (95% CI: -0.751 to -0.199). These results indicate that the Control group reported significantly better asthma-related quality of life than the Intervention group, suggesting that the breathing techniques did not improve quality of life compared to usual asthma management.

Table 5: Paired Samples Test of AQLQ in the intervention group

Paired Samples Statistics					
		Mean	**N**	**Std. Deviation**	**Std. Error Mean**
Pair 1	AQLQ Pre Test Score	3.2500	80	0.77132	0.08624
	AQLQ Post Test Score	3.3625	80	0.66072	0.07387

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Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	AQLQ Pre Test Score & AQLQ Post Test Score	80	0.913	0.000

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95 Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	AQLQ Pre Test Score - AQLQ Post Test Score	-0.11250	0.31797	0.03555	-0.18326	-0.04174	-3.165	79	0.002

The Paired Samples Test compared AQLQ pre-test and post-test scores in the Intervention group to examine the effect of breathing techniques on asthma-related quality of life. The mean pre-test score was 3.2500 (SD = 0.7713, SEM = 0.0862), which increased slightly to 3.3625 (SD = 0.6607, SEM = 0.0739) after the intervention, indicating a modest improvement in participants' quality of life. The correlation between pre-test and post-test scores was very strong ($r = 0.913$, $p < 0.001$), suggesting consistent and reliable changes in the scores. The mean difference of -0.1125 (SD = 0.318, SEM = 0.0356) was statistically significant ($t = -3.165$, $df = 79$, $p = 0.002$), with a 95% confidence interval ranging from -0.1833 to -0.0417, indicating that the true mean difference is likely to fall within this range. These results demonstrate that the use of breathing techniques led to a statistically significant improvement in asthma-related quality of life, confirming that the positive changes observed in the post-test scores were unlikely to have occurred by chance and highlighting the beneficial impact of breathing interventions on overall patient well-being.

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Discussion

The findings showed that the intervention group had a higher proportion of well-controlled asthma during the pre-test (30%). However, both the intervention and control groups demonstrated minimal changes in asthma control in the post-test, with the control group showing slight improvement and a higher proportion of participants remaining poorly controlled. These results are consistent with previous findings suggesting limited short-term effects of breathing techniques on asthma control (Santino et al., 2020). Although breathing techniques are commonly promoted as supportive strategies, existing evidence indicates that their effectiveness as adjunct therapy remains inconclusive. A systematic review by Ernst (2000) reported that while physiotherapeutic breathing techniques may offer potential benefits, their safety and clinical efficacy have not been sufficiently established. Overall, the present findings suggest that although participants in the intervention group initially exhibited better asthma control, breathing techniques alone did not result in substantial improvements in symptom control over the study period.

Assessment of asthma-related quality of life using the AQLQ indicated that participants in the intervention group had a higher proportion of mild impairment during the pre-test. Following the intervention, a notable shift was observed, with fewer participants reporting moderate or severe impairment and more reporting minimal impairment. Although the control group also demonstrated improvement, the degree of change was comparatively smaller. These findings support existing literature suggesting that breathing exercises may positively influence quality of life, reduce hyperventilation symptoms, and improve patient-perceived well-being, particularly among adults with mild to moderate asthma (Santino et al., 2020). However, it is important to emphasize that breathing exercises function as complementary strategies and do not replace pharmacological management. The Global Initiative for Asthma (GINA) guidelines recommend breathing techniques only as supplementary interventions, noting that they do not significantly improve lung function or reduce the risk of exacerbations. Comparison of post-intervention outcomes between the two groups revealed a statistically significant difference in AQLQ scores ($t = -3.427$, $df = 78$, $p = 0.001$), with the control group reporting better asthma-related quality of life than the intervention group. This suggests that the breathing techniques used in the intervention group did not produce superior improvements in quality of life compared to standard care alone.

These results are consistent with studies reporting limited or inconsistent benefits of breathing exercises on asthma symptoms and quality of life. Nonetheless, the literature presents mixed findings. For example, a study published in the *Annals of the American Thoracic Society* reported that breathing exercises used as an adjunct to usual care improved asthma-related quality of life in patients with incompletely controlled asthma, irrespective of disease severity, and without evidence of harm (Andreasson et al., 2022). Similarly, comparisons of breathing techniques have shown that the Buteyko method may demonstrate more favorable trends in asthma control and quality of life than pranayama breathing exercises (Andreasson et al., 2022).

The paired samples test revealed a statistically significant improvement in AQLQ scores ($t = -3.165$, $df = 79$, $p = 0.002$), with a mean difference of -0.1125 (95% CI: -0.18326 to -0.04174), suggesting a slight but meaningful enhancement in quality of life following the intervention. These results align with existing literature on the efficacy of breathing exercises in asthma management. A systematic review

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highlighted that breathing retraining techniques, such as the Buteyko method, can lead to significant reductions in β_2-agonist use and improvements in quality of life for asthma patients (Burgess et al., 2011). A systematic review concluded that breathing retraining techniques can improve asthma-specific health status and other patient-centered measures, though they may not significantly alter asthma pathophysiology (Thomas et al., 2009). Similarly, a Cochrane review found that breathing exercises may positively impact quality of life, hyperventilation symptoms, and lung function in adults with mild to moderate asthma (Santino et al., 2020).

Conclusion

In conclusion, while breathing techniques showed a slight improvement in asthma-related quality of life within the intervention group, they were less effective compared to the control group. The control group demonstrated a more substantial overall improvement in AQLQ scores, indicating better asthma management outcomes. The significant improvement in the intervention group's post-test scores suggests that breathing techniques may offer some benefits for asthma management, but further research is needed to explore their effectiveness compared to other interventions and to address the limitations identified in this study.

References

Abbafati, C., Abbas, K. M., Abbasi, M., Abbasifard, M., Abbasi-Kangevari, M., Abbastabar, H., Abd-Allah, F., Abdelalim, A., Abdollahi, M., Abdollahpour, I., Abedi, A., Abedi, P., Abegaz, K. H., Abolhassani, H., Abosetugn, A. E., Aboyans, V., Abrams, E. M., Abreu, L. G., Abrigo, M. R. M., … Murray, C. J. L. (2020). Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet*, *396*(10258), 1204–1222. https://doi.org/10.1016/S0140-6736(20)30925-9

Andreasson, K. H., Skou, S. T., Ulrik, C. S., Madsen, H., Sidenius, K., Assing, K. D., Porsbjerg, C., Bloch-Nielsen, J., Thomas, M., & Bodtger, U. (2022). Breathing Exercises for Patients with Asthma in Specialist Care A Multicenter Randomized Clinical Trial. *Annals of the American Thoracic Society*, *19*(9), 1498–1506. https://doi.org/10.1513/ANNALSATS.202111-1228OC/SUPPL_FILE/DISCLOSURES.PDF

Beasley, R., Hancox, R., Harwood, M., Perrin, K., Poot, B., Pilcher, J., Reid, J., Talemaitoga, A., & Thayabaran, D. (2016). Asthma and Respiratory Foundation NZ adult asthma guidelines: a quick reference guide. *New Zealand Medical Journal*, *129*, 83–102. https://researchspace.auckland.ac.nz/handle/2292/32347

Boulding, R., Stacey, R., Niven, R., & Fowler, S. J. (2016). Dysfunctional breathing: a review of the literature and proposal for classification. *European Respiratory Review*, *25*(141), 287–294. https://doi.org/10.1183/16000617.0088-2015

Braido, F. (2013). Failure in Asthma Control: Reasons and Consequences. *Scientifica*, *2013*, 1–15. https://doi.org/10.1155/2013/549252

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ISSN: 2976- 1077 (Online)

Multi-disciplinary; Double-blind, Peer review

https://doi.org/10.58196/jhswn.v20i2

Brightling, C. E., Gupta, S., Gonem, S., & Siddiqui, S. (2012). Lung damage and airway remodelling in severe asthma. *Clinical & Experimental Allergy*, *42*(5), 638–649. https://doi.org/10.1111/J.1365-2222.2011.03917.X

Bruton, A., & Lewith, G. T. (2005). The Buteyko breathing technique for asthma: A review. *Complementary Therapies in Medicine*, *13*(1), 41–46. https://doi.org/10.1016/J.CTIM.2005.01.003

Burgess, J., Ekanayake, B., Lowe, A., Dunt, D., Thien, F., & Dharmage, S. C. (2011). Systematic review of the effectiveness of breathing retraining in asthma management. *Expert Review of Respiratory Medicine*, *5*(6), 789–807. https://doi.org/10.1586/ERS.11.69

Courtney, R. (2017). Breathing training for dysfunctional breathing in asthma: taking a multidimensional approach. *ERJ Open Research*, *3*(4). https://doi.org/10.1183/23120541.00065-2017

Courtney, R., Biland, G., Ryan, A., Grace, S., & Gordge, R. (2019). Improvements in multi-dimensional measures of dysfunctional breathing in asthma patients after a combined manual therapy and breathing retraining protocol: a case series report. *International Journal of Osteopathic Medicine*, *31*, 36–43. https://doi.org/10.1016/J.IJOSM.2019.01.003

Ernst, E. (2000). Breathing techniques--adjunctive treatment modalities for asthma? A systematic review. *The European Respiratory Journal*, *15*(5), 969–972. https://doi.org/10.1183/09031936.00.15596900

GINA. (2018). Global Strategy for Asthma Management and Prevention. In *Global Strategy for Asthma Management and Prevention* (Vol. 93, Issue 5). https://ginasthma.org/wp-content/uploads/2019/01/2018-GINA.pdf

Gupchup, G. V., Wolfgang, A. P., & Thomas, J. (1997). Reliability and validity of the asthma quality of life questionnaire—marks in a sample of adult asthmatic patients in the United States. *Clinical Therapeutics*, *19*(5), 1116–1125. https://doi.org/10.1016/S0149-2918(97)80064-1

James, D. R., & Lyttle, M. D. (2016). British guideline on the management of asthma: SIGN Clinical Guideline 141, 2014. *Archives of Disease in Childhood - Education and Practice*, *101*(6), 319–322. https://doi.org/10.1136/ARCHDISCHILD-2015-310145

Juniper, E. F., Guyatt, G. H., Epstein, R. S., Ferrie, P. J., Jaeschke, R., & Hiller, T. K. (1992). Evaluation of impairment of health related quality of life in asthma: development of a questionnaire for use in clinical trials. *Thorax*, *47*(2), 76–83. https://doi.org/10.1136/THX.47.2.76

Juniper, E. F., Sonia Buist, A., Cox, F. M., Ferrie, P. J., & King, D. R. (1999). Validation of a Standardized Version of the Asthma Quality of Life Questionnaire. *Chest*, *115*(5), 1265–1270. https://doi.org/10.1378/CHEST.115.5.1265

K, P., & Sharma, D. (2018). Yoga as a complementary therapy improves pulmonary functions in patients of bronchial asthma: A randomized controlled trial. *National Journal of Physiology, Pharmacy and Pharmacology*, *8*(0), 1. https://doi.org/10.5455/njppp.2018.8.1033009112018

Lavoie, K. L., Cartier, A., Labrecque, M., Bacon, S. L., Lemière, C., Malo, J. L., Lacoste, G., Barone,

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Multi-disciplinary; Double-blind, Peer review

https://doi.org/10.58196/jhswn.v20i2

S., Verrier, P., & Ditto, B. (2005). Are psychiatric disorders associated with worse asthma control and quality of life in asthma patients? *Respiratory Medicine*, *99*(10), 1249–1257. https://doi.org/10.1016/j.rmed.2005.03.003

Nathan, R. A., Sorkness, C. A., Kosinski, M., Schatz, M., Li, J. T., Marcus, P., Murray, J. J., & Pendergraft, T. B. (2004). Development of the Asthma Control Test: A survey for assessing asthma control. *Journal of Allergy and Clinical Immunology*, *113*(1), 59–65. https://doi.org/10.1016/j.jaci.2003.09.008

Prasanna, K. B., Sowmiya, K. R., & Dhileeban, C. M. (2015). Effect of Buteyko breathing exercise in newly diagnosed asthmatic patients. *International Journal of Medicine and Public Health*, *5*(1), 77. https://doi.org/10.4103/2230-8598.151267

Santino, T. A., Chaves, G. S. S., Freitas, D. A., Fregonezi, G. A. F., & Mendonça, K. M. P. P. (2020). Breathing exercises for adults with asthma. *Cochrane Database of Systematic Reviews*, *2020*(3). https://doi.org/10.1002/14651858.CD001277.pub4

Schatz, M., Sorkness, C. A., Li, J. T., Marcus, P., Murray, J. J., Nathan, R. A., Kosinski, M., Pendergraft, T. B., & Jhingran, P. (2006). Asthma Control Test: reliability, validity, and responsiveness in patients not previously followed by asthma specialists. *The Journal of Allergy and Clinical Immunology*, *117*(3), 549–556. https://doi.org/10.1016/J.JACI.2006.01.011

Thomas, M., McKinley, R. K., Mellor, S., Watkin, G., Holloway, E., Scullion, J., Shaw, D. E., Wardlaw, A., Price, D., & Pavord, I. (2009). Breathing exercises for asthma: a randomised controlled trial. *Thorax*, *64*(1), 55–61. https://doi.org/10.1136/THX.2008.100867

Veidal, S., Jeppegaard, M., Sverrild, A., Backer, V., & Porsbjerg, C. (2017). The impact of dysfunctional breathing on the assessment of asthma control. *Respiratory Medicine*, *123*, 42–47. https://doi.org/10.1016/J.RMED.2016.12.008

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