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Effect Of Various Breathing Techniques on the Quality of Life in Patients with Mild to Moderate Asthma: A Narrative Review

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Abstract:- Yoga, along with breathing exercises, is an integrated therapy of growing acceptance that can produce a range of physical, mental, and social benefits. This review explores the feasibility and outcomes of a Breathing exercise program on health-related Quality of life in asthmatic patients. We searched the published literature on the Google Scholar and PubMed databases with keywords 'Breathing exercise', 'asthma', 'Pranayama', randomize 'Yoga' AND 'quality of life'.We could find seven randomized-controlled trials concerning breath retraining in bronchial "asthma". Due to wide variations in applied interventions, outcomes assessed, and small sample size in most trials, it was difficult to extract a definite role of breathing exercises in the management of "asthma". However, the outcomes from controlled trials suggest that breath training might have a role in the remedy and control of bronchial allergies. Furthermore, studies are needed with large sample sizes to find the utility of breath retraining strategies in the management of Bronchial, "asthma".

Keywords:- *Asthma, Breathing exercise, Pranayama, Quality of life, yoga.*

I. INTRODUCTION

Many complementary or unconventional therapies (including breathing techniques and pranayama) have been tried as an enviable option in patients with "asthma".[1] "Asthma" is a chronic airway Problemcharacterized by inflammation in the lungs, bronchial hyperactivity, and variable airflow restriction. As per the "world health organization" (WHO), millions of individuals suffer from "asthma", which has an impact on their quality of life. The number of persons impacted has risen fast over the world, particularly in urban areas.[2]

Pranayama, which is mentioned in ancient literature and is an important aspect of yoga, has recently attracted the attention of researchers. In the Sanskrit language, pranayama is described as "breathing science, breath control, and breathing consciously." Pranayama is a technique for controlling and directing energy in the body's breathing to cure, maintain, and improve well-being. Pranayama is based on the interplay of emotions, cognition, and behaviour.[2] the primary goal of pranayama and breathing techniques in "asthma" is to control breathing patterns and thus reduce hyperventilation. apart from this, these exercises might help patients with "asthma" by affecting psychological factors like stress, depression, etc., and improving the strength/tolerance of respiratory muscles.[3] Pranayama has been used to alleviate "asthma" symptoms without the use of medication. The use of many different breathing exercises in this aspect has been documented in the literature.[4]

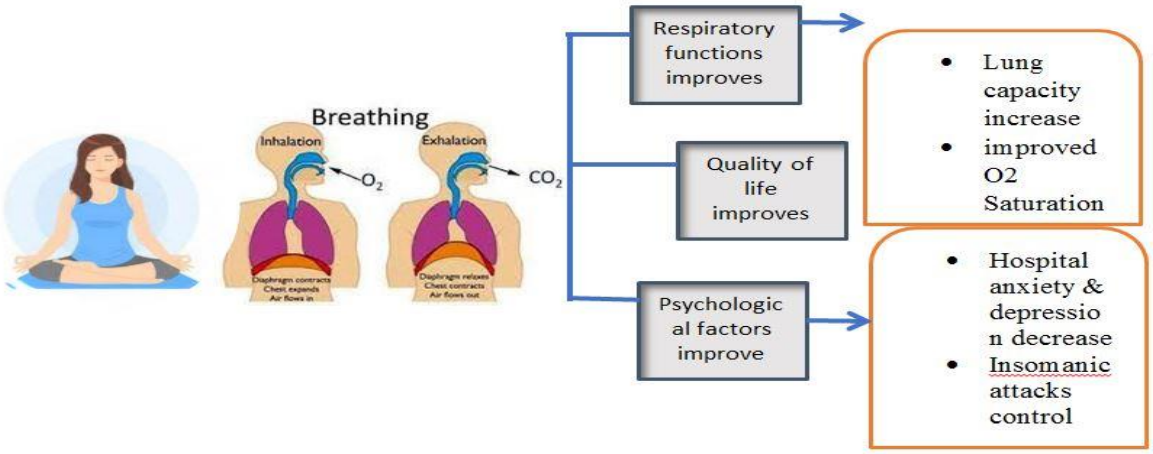

Fig. 1

II. ROLE OF BREATHING EXERCISE ON QOL

Current evidence: -

- **Agnihotri S.et.al.** (California, USA) (2017) Done a randomized controlled study with the grade of 'mild-to-moderate' bronchial "asthma" Patients' severity on the report of the GINA-2011 among 300 patients of both genders, aged group 12 - 60 years. non-smokers or ex-smokers and *"reversible airflow limitation >12% and >200 ml post-bronchodilator FEV1 >12% and >200 mL"* [5] were divided into two groups (150 experimental and 150 control), Patients in "the *Yoga* group" received **the y**ogic intervene per day for 30 min, five days in a week for six months with the standard care on the report of the "GINA guidelines (inhaled β-2 agonist and inhaled corticosteroid with LABA combination)" the control group had taken the standard treatment only. The findings revealed that yoga improves the quality of life in a couple of groups, in yoga group saw more improvement in "Quality of life" (QOL) as compared to the control group, Differences.In the third month, the symptom score in "the Yoga group" raised by 29.07% from 3.68 to 4.75 (P = 0.11). The score for activity limitation raised by 42.7% from 3.56 to 5.08 (p = 0.02). From 3.21 to 5.49 (P = 0.028), significant improvement was seen of 71.03% in emotional function score, total score increased by 49.09% from 3.45 to 4.92 (p=0.0001) and the response to environmental stimuli improved by 38.87% from 3.20 to 4.43 (P = 0.012).The Yoga group perform the improvement quite earlier.[5]
- **Prem V.et.al.** (California, USA) (2013) through block randomization, 120 individuals were assigned to one of three groups. Subjects ranged in age from 18 to 60 years old, had a score of 5.5 on "Asthma Quality of life (AQLQ)"[6,] and experienced an increase of 12% in "forced expiratory volume in one second (FEV1)" after administrating bronchodilator. Had been using bronchodilators for six months, and the patient had not experienced exacerbation for eight weeks. Subjects in the 'pranayama and Buteyko' groups were encouraged to do the prescribed practice for 15 minutes 2 times a day for 3 months after being trained for 3-5 days. During the trial, the control group received standard pharmaceutical treatment. Baseline characteristics were identical in all three groups. . After 3 months of the intervention in all three groups, the Buteyko group demonstrated superior progress of improvement in total AQLQ than both groups (Pranayama and control). The p-value of the pranayama group was p>0.05 the Pranayama showed a significant improvement in all domains of the AQLQ score (0.50 (0.01–0.98), P = 0.042, as compared to the control group.The Buteyko group improved faster than the pranayama breathing exercise group in terms of quality of life and "asthma" management.[7]
- **Andreasson KH et al**. (Denmark) (2019) The experiment is a randomized, controlled trial, single-blinded, multi-centric superiority trial with two parallel groups with a primary outcome of change in (MiniAQLQ) at six months from the start of the intervention or 12 weeks following the intervention period. 190 patients were referred to the Respiratory Clinic from outpatient for uncontrolled Asthma. Written consent at the age of 18 years and with an 'Asthma Control Questionnaire (ACQ)' 6 scores of 0.8. Speaks reads and understands Danish.BrEX consists of three 60-minute physiotherapy treatments (first session=week 1) and one 30-minute session (weeks 4 and 9, seven days). The major end measure is the mean difference between groups from baseline to 6 months follow up in Mini AQLQ scores. They examine the impact of breathing pattern modification and relaxation delivered by a physiotherapist on AQLQ in individuals with poor "asthma" control while getting specialized treatment. P values of less than 0.05 are considered statistically significant. [8]
- "Physiotherapy breath retraining" and "asthma" nurse education were two groups in a randomized, controlled study by **M Thomas et al. (2003)** they looked at how the two groups did. People who had "asthma" and were between the ages of 17 and 65 were found in their

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medical records. In the previous year, they received either an oral bronchodilator or prophylactic anti-asthma medication. It was important to look at how "asthma"-specific health status the "asthma Quality of Life questionnaire" and the 'Nijmegen questionnaire' scores were for each person. After 6 months of treatment, the results showed that more than 25% of the people who had the treatment still had better health 6 months later. Although some improvements were seen in the total score (p=0.065), in the symptoms domain (p=0.059), and the environment domain (p=0.059)[9]

- **Elise Coulson et al.** (2021) used tools to compare yoga-based breathing practices (Intervention group) to spirometer-based breathing (Control group). Within one month of intervention, the "Asthma Control Test" and "Mini AQLQ" were administered to elderly "asthmatic" patients. The study enrolled 90 participants (45 in each arm). Due to the brief duration of the intervention, no group achieved statistical significance, but ACT and mini-AQLQ scores improved, the baseline *p-value* = 0.198, and after follow up *p-value* = 0.56. The intervention's subjects perceived breathing exercises to be beneficial and 87% would recommend them to a friend. [10]
- **Emily Julia Arden-Close et al.** (2019) in this study subject is allocated into two groups face-to-face breathing retraining F2FB (n=132) and DVD /booklet (n=261) for people along with "asthma" using the "Hospital Anxiety and Depression Scale" and the AQLQ. They concluded that the quantity of practice had no discernible relationship with the quality of life. Greater confidence in one's ability to retrain one's breathing described 3.9 % of the difference in 1 year of quality of life in both arms (booklet and DVD) P-value shows significant improvement (P=0.05; p= 0.01;p=0.001) [11]
- **M. Malarvizhi et al.** (2018) Studied For "asthma" patients, they included individuals of either sex (250, 125 in each arm) between the ages of 21 or 60 who fulfilled the criteria of "Global Initiatives for asthma" (GINA). Minimum of two years since prognosis and while undergoing conventional therapy Non-smoker, able to communicate in English or Tamil, and willing to engage in the study for 0 months (baseline), 3 months, and 6 months. The AQLQ was used as an assessment tool. The yoga group showed better improvement as compared to the control group in AQOL categories such as symptoms, functional limits, emotional functions, and environmental stimuli (overall at *P-value*<0.05). Conventional care combined with Yoga is more beneficial than conventional care alone [12]

Author	Year	intervention	Inclusion Criteria	Primary Outcome (s)	Secondary Outcome (s)	Sample Size N	Findings
Agnihotri S. et.al	2017	30 min practice of Yoga which includes asana, pranayama and meditation, and "conventional care according to the GINA guidelines"	' As per GINA-2011 severity should be mild to moderate, aged 12 to 60 years, reversible airflow limitation should be greater than 12 % and non-smoker's or ex-smokers and	Quality of life 'self-administered Mini AQLQ' [6] was used	--	300	The findings revealed that yoga improves the quality of life in a couple of groups, in yoga group saw more improvement (p<0.001) in QOL compared with the control group...

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Prem V.et.al.	2013	Buteyko (breath-holding, interspersed with periods of shallow breathing)and pranayama (diaphragmatic breathing, thoracic breathing, upper lobe breathing and full yogic breathing and alternate nostril breathing)	Aged 18 to 60 years, (AQLQ) score< 5.5, after bronchodilator administration increase of > 12 % forced expiratory volume in one second,six months of bronchodilator use, and patients who had not an exacerbation in the previous eight weeks.	A self-administered version of (AQLQ)	Pulmonary function test, "asthma" control test	120	The Buteyko group showed more improvement in QOL and "asthma" management than the pranayama group. When compared to the control group, Both breathing training groups improved their quality of life significantly. (P=0.042)
Andreasson KH et al.	2019	"BrEX" comprises three physiotherapy sessions	190 patients were Referred to respiratory clinic from outpatient for uncontrolled asthma, 2 and more than 2 doctor visits to a specialized "asthma" clinic led by a pulmonologist. Written consent at the age of 18 years and with an ACQ6 score of 0.8. Speaks, reads, and understands Danish.	Group difference in the Mini "Asthma Quality of Life Questionnaire" [6] (MiniAQLQ) between groups	Spirometry and accelerometer.	190	P-value < 0.05 will be regarded as statistically significant.
M Thomas et al.	2003	physiotherapy breathing retraining	Patients aged 17 to 65 having an "asthma" diagnosis and either they received an oral bronchodilator or prophylactic anti-asthma medication in the previous year were identified from medical data.	"asthma" specific health status (AQLQ) and 'Nijmegen questionnaire Scores'		20	After 6 months of intervention, improvement is maintained is 25% improvement was seen in the overall score (p=0.065), symptoms domain (p=0.059), environment domain (p=0.065).
Elise Coulson et al.	2021	three types of breathing techniques "(a yoga a technique called villoma pranayama,	one group was asked to perform breathing exercises and a control group was given an incentive	ACT questionnaire	mini-AQLQ, health-related quality of life the instrument,	45	Breathing exercises were proven to be beneficial to the participants, and 87% Would recommend them to a friend. Even though both groups improved on the ACT and mini-AQLQ, there

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		diaphragmatic breathing, and pursed-lip breathing)". Control group: take 2 breaths with the incentive spirometer Twice a day.	spirometer		and spirometric measures		were no differences between them. Both groups had decreased FEV1. the baseline p-value = p=0.198 and after follow up p-value = 0.56
Emily Julia Arden-Close et al.	2019	1. Slow breathing 2. Controlled breath 3. holding 4. relaxation	Adults with "asthma"	AQLQ (asthma Quality of Life Questionnaire)[6] hospital anxiety and depression scale		393	The amount of training had no significant effect on the quality of life. Greater confidence in one's ability to retrain one's breathing described 3.9 % of the difference in 1 year of quality of life in the DVD and Booklet arm.The P-value was statistically significant at 3 months ($p< 0.005$) , 6 months and ($p< 0.01$) 12 months ($p < 0.001$)
M. Malarvizhi et al.	2018	asanas and pranayama	Age between 21 to 60 years, who fulfilled the criteria of the Global Initiatives for "asthma" (GINA), Minimum of two years since diagnosis and receiving medical treatment, Not doing yoga, Non-smokers, Willing to engage in the study and able to communicate in either English or Tamil	"asthma" Quality of life Questionnaire [6] (AQLQ)		250	The yoga group showed better improvement as compared to control group in AQOL categories such as symptoms (P0.001), functional limits (P0.001), emotional functions (P0.001), and environmental stimuli (P0.001).

Table 1

A. Strength and limitations:

In terms of our narrative review, there are several significant strengths and limitations. The details of various aspects of the research methodology used in these studies have been provided in the Table.

B. Strengths:

We included only randomized controlled trials in this narrative review, which is a significant strength. This ensures that the evidence for the effectiveness of breathing exercises is stronger than that acquired from observational and cohort studies. Acceptability, adherence, practicality, and safety were also considered, as these are important features of practical use and future deployment in healthcare organizations. Furthermore, only interventions in which the patient was actively participating in the monitoring process were included.

C. Limitations:

Subject selection/Inclusion criteria were not uniform in all studies and disease severity is not mentioned. Only two studies followed GINA guidelines for "asthma" severity. sample size selection was also not uniform. The same was with smoking status and age group in the inclusion criteria.

Interventions were not uniform in all studies, different types of breathing exercises were used in these studies i.e. –

Physiotherapy, breathing training, Buteyko, pursed-lip breathing, yogic breathing, etc.

Outcomes parameters varied between studies. Most of the studies had not adequately defined their research methodology.

III. CONCLUSION

In the narrative review, we have tried to assess the impact of breathing training and similar interventions on the management of patients with bronchial "asthma". Despite various limitations of the review detailed in the text, there are some clear outcomes of the review suggesting a possible role of these interventions in the management of "asthma". Alternative therapies possibly can improve quality of life and reduce the need for medication eventually helping reduce the cost of treatment also. And, there is a definite need for larger studies with stringent research methods, for a better understanding of these facts.

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- **Ethical approval: -** No need for ethical approval because this is a review article.
- **Informed consent: -** Not Applicable.
- **Trial registration: -** Not Applicable.

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