

Clinical Scenario:

18-year-old female patient complains of wheezing, coughing, shortness of breath, and feeling tightness in her chest 2-3 times per week. She has a history of asthma and often uses pharmacological treatment options to control her symptoms. She heard from a friend that yoga can be for one's breathing and increasing respiratory function. She is wondering if that would be a good option for her. She asks if there has been any research done on yoga as an additional treatment option for increasing quality of life in patients with asthma.

Search Question:

Does yoga improve health-related quality of life and symptom control in patients with asthma?

PICO search terms:

P	I	C	O
asthma	yoga	Usual care	Asthma control
Adults	Adjuvant yoga	Sham intervention	Quality of life
children		Standard care	Medication dose decreases
Bronchial hypersensitivity and inflammation		Pharmacologic treatment	Symptom control
Recurrent airway obstruction			harms

Search Strategy:

→ If meta-analyses or systematic reviews were not available, I would search for randomized controlled trials. These studies examine the outcomes of two groups of patients with asthma, one who engaged in yoga practice and one that did not (perhaps only being treated with standard asthma care) and then determine if the intervention group had a better outcome and note any negative events (such as asthma exacerbations or airway distress).

→ If RCTs were not available, I would look for a cohort study that would prospectively or retrospectively study a group of patients with asthma who engaged in yoga and compare their relative outcomes in terms of quality of life, asthma symptoms and medication dose decrease and see if there was any statistically significant changes in that cohort.

Search tools and strategy used:

PubMed:

“Yoga” → 6,412

Filter: 5 years → 3,521

+ asthma → 44

Filter: clinical trial → 6

Google Scholar:

“Yoga for asthma” → 30,400

Filter: since 2017 → 10,800

+ meta analysis → 4,390

Filter: since 2020 → 1,840

JAMA:

“yoga” → 262

+asthma → 11

Filter: research → 6

Cochrane Library:

Yoga → 49

+ asthma → 4

Explain how you narrow your choices to the few selected articles:

I narrowed my articles by ruling out the ones that did not relate to my PICO question. For example, many articles discussed yoga as a treatment for COPD. Although this is a related topic, I wanted to focus on asthma specifically, so I eliminated those. There were also articles that were published over 10 years ago, which I eliminated as well. I chose articles that looked at the outcomes I discussed, such as quality of life, asthma severity scores, and patient’s response to treatment. Google Scholar offered the most results, so I used that database to get an overview of the articles available on this topic. Even with filtering for articles since 2020, and specifying only meta-analyses there were still over 1,800 results. Although some of the top ranked articles were closely related to my topic, many were not applicable. I also found it difficult to find the full PDF for the articles, with many websites stating “login through your institution” for the full text. Therefore, I then focused on databases that are available through the York Library, which I found to be more helpful. These databases included PubMed, JAMA, and Cochrane Library. Cochrane Library had four reviews, one of which was from 2016 and directly answered my PICO question, so this was very helpful. After applying my filters, JAMA yielded six articles. PubMed had the most relevant articles, and I found

applicable clinical trials there. Thankfully, I found enough articles that were published after 2015 so I was able to eliminate articles that were published before then. To find a sixth high quality article for this CAT was very difficult. I ended up having to start a 14-day trial for an academic website to get access to a new article that is still in pre-print.

#### Article #1

Citation: Yang, Zu-Yao, et al. "Yoga for asthma." Cochrane Database of Systematic Reviews 4 (2016).

yoga for asthma

[Zu-Yao Yang](#), [Hui-Bin Zhong](#), [Chen Mao](#), [Jin-Qiu Yuan](#), [Yafang Huang](#), [Xin-Yin Wu](#), [Yuan-Mei Gao](#), [Jin-Ling Tang](#)

Link: <https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD010346.pub2/full>

#### Abstract:

##### Background

Asthma is a common chronic inflammatory disorder affecting about 300 million people worldwide. As a holistic therapy, yoga has the potential to relieve both the physical and psychological suffering of people with asthma, and its popularity has expanded globally. A number of clinical trials have been carried out to evaluate the effects of yoga practice, with inconsistent results.

##### Objectives

To assess the effects of yoga in people with asthma.

##### Search methods

We systematically searched the Cochrane Airways Group Register of Trials, which is derived from systematic searches of bibliographic databases including the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, CINAHL, AMED, and PsycINFO, and handsearching of respiratory journals and meeting abstracts. We also searched PEDro. We searched ClinicalTrials.gov and the WHO ICTRP search portal. We searched all databases from their inception to 22 July 2015, and used no restriction on language of publication. We checked the reference lists of eligible studies and relevant review articles for additional studies. We attempted to contact investigators of eligible studies and experts in the field to learn of other published and unpublished studies.

##### Selection criteria

We included randomized controlled trials (RCTs) that compared yoga with usual care (or no intervention) or sham intervention in people with asthma and reported at least one of the following outcomes: quality of life, asthma symptom score, asthma control, lung function measures, asthma medication usage, and adverse events.

##### Data collection and analysis

We extracted bibliographic information, characteristics of participants, characteristics of interventions and controls, characteristics of methodology, and results for the outcomes of our interest from eligible studies. For continuous outcomes, we used mean difference (MD) with

95% confidence interval (CI) to denote the treatment effects, if the outcomes were measured by the same scale across studies. Alternatively, if the outcomes were measured by different scales across studies, we used standardized mean difference (SMD) with 95% CI. For dichotomous outcomes, we used risk ratio (RR) with 95% CI to measure the treatment effects. We performed meta-analysis with Review Manager 5.3. We used the fixed-effect model to pool the data, unless there was substantial heterogeneity among studies, in which case we used the random-effects model instead. For outcomes inappropriate or impossible to pool quantitatively, we conducted a descriptive analysis and summarized the findings narratively.

#### Authors' conclusions

We found moderate-quality evidence that yoga probably leads to small improvements in quality of life and symptoms in people with asthma. There is more uncertainty about potential adverse effects of yoga and its impact on lung function and medication usage. RCTs with a large sample size and high methodological and reporting quality are needed to confirm the effects of yoga for asthma.

#### Article #2

Citation: Hiles, Sarah A., et al. "A feasibility randomised controlled trial of Novel Activity Management in severe ASthma-Tailored Exercise (NAMASTE): yoga and mindfulness." BMC pulmonary medicine 21.1 (2021): 1-18.

A feasibility randomised controlled trial of Novel Activity Management in severe ASthma-Tailored Exercise (NAMASTE): yoga and mindfulness

[Sarah A. Hiles](#), [Paola D. Urroz](#), [Peter G. Gibson](#), [Adam Bogdanovs](#) & [Vanessa M. McDonald](#)

Link: <https://bmcpulmed.biomedcentral.com/articles/10.1186/s12890-021-01436-3>

#### Abstract:

##### Background

Physical inactivity is common in severe asthma and associated with poor health outcomes. New approaches are needed to address physical inactivity in this group.

##### Objective

To examine whether yoga and mindfulness improves health-related quality of life (HRQoL) compared with a minimal active control group and collect feasibility data to inform future studies.

##### Methods

Over 12-weeks, adults with severe asthma were recruited. Participants were randomised 2:1 to parallel yoga or control groups. All participants received an activity tracker. The yoga group received tailored group classes twice a week for 16-weeks with a qualified yoga instructor. The control group set activity goals with a research officer and received eight progress calls. Outcomes were assessed at 16-weeks. Primary outcome was St George's Respiratory Questionnaire (SGRQ). Secondary outcomes included asthma control, physical activity, breathlessness, and inflammation. Face-to-face qualitative interviews were conducted to determine acceptability.

## Results

There were 15 participants randomized to yoga (mean 67 years; 60% female) and 9 to control (68 years; 56% female). Planned comparisons indicated the yoga group had greater SGRQ improvement than the control group. There was little change in secondary outcomes. Moderate-vigorous activity increased substantially in the control group. Participants found the intervention acceptable; key barriers and facilitators were social connection, the setting, addressing breathing and asthma symptoms, changing their mindset, and the intersection of different elements.

## Conclusion

A yoga and mindfulness intervention was feasible, acceptable to patients and improved HRQoL. The findings will inform design of much needed future research into physical activity interventions for severe asthma.

## Article #3

Citation: Turan, Gülcan Bahçecioğlu, and Mehtap Tan. "The effect of yoga on respiratory functions, symptom control and life quality of asthma patients: a randomized controlled study." *Complementary therapies in clinical practice* 38 (2020): 101070.

The effect of yoga on respiratory functions, symptom control and life quality of asthma patients: A randomized controlled study

[GülcanBahçecioğlu TuranMehtapTan](#)

LINK: <https://www.sciencedirect.com/science/article/abs/pii/S1744388119308060>

## Abstract:

### Aim

This study was conducted to find out the effect of yoga applied to asthma patients on the patients' respiratory functions, symptom control and quality of life.

### Methods

The sample of the study consisted of a total of randomly chosen 112 asthma patients, 56 in the experimental group and 56 in the control group, who met the research criteria and who agreed to participate in the study. A total of 12 yoga sessions, 2 sessions a week for 6 weeks, was applied to the patients in the experimental group. The patients in the control group did not receive any intervention.

### Results

In the intragroup comparison of average pre-test and post-test scores of respiratory function and Asthma Control Test (ACT) and Asthma Quality of Life Scale (AQLQ) total and sub-dimension scores of the patients in the experimental and control group, the difference was found to be statistically significant ( $p < 0.05$ ). In addition, post-test score averages were found to increase in the experimental group, while they were found to decrease in the control group.

### Conclusion

It was found that yoga influenced respiratory functions, symptom control and quality of life positively in asthma patients.

Article #4

Citation: Das, Rashmi R., Jhuma Sankar, and Sushil Kumar Kabra. "Role of breathing exercises and yoga/pranayama in childhood asthma: a systematic review." *Current pediatric reviews* 15.3 (2019): 175-183.

Role of Breathing Exercises and Yoga/Pranayama in Childhood Asthma:  
A Systematic Review

[Das, Rashmi R.](#); [Sankar, Jhuma](#); [Kabra, Sushil Kumar](#)

LINK: <https://pubmed.ncbi.nlm.nih.gov/30663571/>

Abstract:

Background: Various complementary or alternative medicines (including breathing exercises and yoga/pranayama) have been tried as an attractive option to pharmacotherapy in childhood asthma.

Objective: To evaluate the role of breathing exercise and yoga/pranayama as add on therapy to the "pharmacologically recommended treatment" of childhood asthma.

Methods: We searched the published literature in the major databases: Medline via Ovid, PubMed, CENTRAL, Embase, and Google Scholar till June 2018. Randomized trials comparing breathing exercises and yoga/ pranayama versus control or as part of a composite intervention versus control were included. The primary outcome measures were quality of life and change in asthma symptoms. Secondary outcomes were: decrease in medication use, number of exacerbations, change in lung function and immunological parameters, school absenteeism and adverse events.

Results: A total of 10 trials (466 children, 6-14 years age) were included. The severity of asthma varied among the trials. The data for primary outcome measures could not be pooled, there were mixed results for both primary and secondary outcomes. No significant benefit was obtained in acute asthma and the lung function tests [except PEF % at 4-6 weeks, PEF absolute at 3 months, and FVC absolute at 3 months] in chronic asthma. One trial compared breathing exercise versus yoga and found no difference. Adverse events were not significant.

Conclusions: Breathing exercise and yoga/ pranayama may have some additive role in the treatment of childhood asthma. However, at present, it cannot be recommended as a standard of care due to insufficient data.

Article #5

Citation: Agnihotri, Shruti, et al. "Assessment of significance of Yoga on quality of life in asthma patients: A randomized controlled study." *Ayu* 38.1-2 (2017): 28.

Assessment of significance of Yoga on quality of life in asthma patients: A randomized controlled study

[Shruti Agnihotri 1](#), [Surya Kant 1](#), [Satyendra Kumar Mishra 2](#), [Ajay Verma 1](#)

Link: <https://pubmed.ncbi.nlm.nih.gov/29861589/>

Abstract:

**Background:** Asthma is a chronic inflammatory respiratory disease characterized by periodic attacks of wheezing, shortness of breath and a tight feeling in the chest. The current study is based on the effect of Yoga on quality of life in asthmatics in Northern India.

**Materials and methods:** A total of 300 participants of mild-to-moderate persistent asthma (FEV1 >60%) aged between 12 and 60 years were recruited from the Department of Pulmonary Medicine. Their quality of life was assessed with the help of mini asthma quality-of-life questionnaire (AQLQ) at baseline and then after 3rd and 6th month from baseline. Forty-five participants were dropped out during the study while 255 participants completed the study successfully.

**Results:** In "the Yoga group," significant improvements were found in all the subdomains of AQLQ at 3rd month and at 6th month in comparison to "the control group." The number needed to treat was found to be 2.67 for the total AQLQ score which was greater than the minimal important difference.

**Conclusion:** "The Yoga group" got significantly better improvement in asthma quality-of-life scores than "the control group." Thus, Yoga can be used as an adjuvant therapy in the management of asthma.

#### Article #6

**Citation:** Yadav P, Jain PK, Sharma BS, Sharma M. Yoga Therapy as an Adjuvant in Management of Asthma. Indian J Pediatr. 2021 Nov;88(11):1127-1134. doi: 10.1007/s12098-021-03675-y. Epub 2021 Feb 24. PMID: 33625666.

Yoga Therapy as an Adjuvant in Management of Asthma

[Pallavi Yadav](#)<sup>1</sup>, [Pankaj Kumar Jain](#)<sup>1</sup>, [B S Sharma](#)<sup>2</sup>, [Meenakshi Sharma](#)<sup>3</sup>

<https://pubmed.ncbi.nlm.nih.gov/33625666/>

#### Abstract

**Objective:** To assess the effect of yoga on control of asthma in children with bronchial asthma.

**Methods:** This hospital-based interventional randomized controlled trial conducted in the Department of Pediatrics at a tertiary care center of North India from November 2017 to October 2018 enrolled 140 newly diagnosed cases of asthma of age 10-16 y who were randomly divided into two groups. Seventy children in the case group practiced yoga under supervision for a period of 3 mo in addition to pharmacological treatment. Seventy controls received only pharmacological treatment. Pulmonary-function tests were done at baseline, 6 wk, and 12 wk along with quality of life (QOL) assessment by Pediatric Asthma Quality of Life Questionnaire (PAQLQ). The outcome measures assessed were forced vital capacity (FVC), forced expiratory volume in one second (FEV1), FEV1/FVC and peak expiratory flow rate (PEFR). QOL evaluation was done in 3 domains: activity limitation, symptoms, and emotional function.

Results: The asthmatic children practicing yoga have shown significant improvement in FVC, FEV1, FEV1/FVC and PEFR which was better as compared to controls. Improvement was also noted in mean-PAQLQ score in cases which was statistically significantly better as compared to controls.

Conclusion: Yoga appears to have significant positive effect on control of asthma measured by pulmonary-function test and QOL. Therefore yoga therapy can be recommended as an adjuvant in management of asthma along with standard pharmacological management.

Author (Date)	Level of Evidence	Sample/ Setting	Outcomes studied	Key Findings	Limitations and Biases
<a href="#">Zu-Yao</a> <a href="#">Yang, Hui-Bin</a> <a href="#">Zhong, Chen</a> <a href="#">Mao, Jin-Qiu</a> <a href="#">Yuan, Yafang</a> <a href="#">Huang, Xin-Yin</a> <a href="#">Wu, Yuan-Mei</a> <a href="#">Gao, Jin-Ling</a> <a href="#">Tang</a> (2016)	Cochran e Review	<ul style="list-style-type: none"> <li>•This review included 15 studies that compared the effects of yoga with usual treatment or a 'sham' yoga in 1048 participants.</li> <li>•The majority of participants were adults of both sexes with mild to moderate asthma for six months to more than 23 years.</li> <li>•Interventions lasted from two weeks to 54 months, for no more than six months in the majority of studies.</li> </ul>	<ul style="list-style-type: none"> <li>•Five studies included yoga breathing alone, while the other studies assessed yoga interventions that included breathing, posture, and meditation.</li> <li>•Quality of life, improvement in symptoms, reduced medication usage, change from baseline FEV1.</li> </ul>	<ul style="list-style-type: none"> <li>•There was some evidence that yoga may improve quality of life (MD in Asthma Quality of Life Questionnaire (AQLQ) score per item 0.57 units on a 7-point scale, 95% CI 0.37 to 0.77; 5 studies; 375 participants), improve symptoms (SMD 0.37, 95% CI 0.09 to 0.65; 3 studies; 243 participants), and reduce medication usage (RR</li> </ul>	<ul style="list-style-type: none"> <li>•No serious adverse events associated with yoga were reported, but the data on this outcome was limited. Confidence in the results was low, the quality of the evidence was rated moderate to very low, as most of the studies included in this review were flawed in various ways. The effects of yoga on lung function were inconsistent. Information</li> </ul>

				<p>5.35, 95% CI 1.29 to 22.11; 2 studies) in people with asthma.</p> <ul style="list-style-type: none"> <li>•The effects of yoga on change from baseline forced expiratory volume in one second (MD 0.04 liters, 95% CI -0.10 to 0.19; 7 studies; 340 participants; I2 = 68%) were not statistically significant.</li> <li>•No serious adverse events associated with yoga were reported, but the data on this outcome was limited.</li> </ul>	<p>on unwanted side effects was very limited; more studies would be needed to assess this.</p>
<p><a href="#">Sarah A. Hiles</a>, <a href="#">Paola D. Urroz</a>, <a href="#">Peter G. Gibson</a>, <a href="#">Adam Bogdanovs</a> &amp; <a href="#">Vanessa M. McDonald</a> (2021)</p>	<p>Pilot RCT</p>	<ul style="list-style-type: none"> <li>•This was a single-center parallel-group pilot randomized controlled trial (RCT) with 2:1 allocation to the yoga intervention group or</li> </ul>	<ul style="list-style-type: none"> <li>•Health-related quality of life</li> <li>• Shifts in The St George’s Respiratory Questionnaire SGRQ Activity</li> </ul>	<ul style="list-style-type: none"> <li>•Participants reported impaired health-related quality of life at baseline, which improved for participants in the yoga group. The St</li> </ul>	<ul style="list-style-type: none"> <li>•This is a pilot study, which means it was purposely done with a small group of participants in order to assess</li> </ul>

		<p>minimal active control group.</p> <ul style="list-style-type: none"> <li>•15 participants randomized to yoga (mean 67 years; 60% female) and 9 to control (68 years; 56% female).</li> <li>•The intervention group participated in two supervised 75-min group classes of yoga and mindfulness per week for 16-weeks in a private room during office hours (up to 8 participants/class), in addition to usual care.</li> <li>•The control group received a minimal physical activity goal-setting intervention supported through telephone contact with an exercise physiologist research officer, in addition to usual care.</li> </ul>	<p>subscale. This subscale characterizes activities that are caused or limited by breathlessness.</p> <ul style="list-style-type: none"> <li>• Secondary outcomes: asthma control, physical activity, breathlessness, and inflammation</li> </ul>	<p>George's Respiratory Questionnaire SGRQ Activity subscale shifted most. This subscale characterizes activities that are caused or limited by breathlessness. The quantitative findings also suggested numeric (although small) improvements in dyspnea and asthma control in the intervention group, relative to the control group.</p> <ul style="list-style-type: none"> <li>•Participants identified the most helpful components to improve breathing were learning to connect breath with movement, stress-reducing relaxation skills, and yogic breathing exercises.</li> </ul>	<p>whether this type of study was feasible for implementation in practice. However, the small sample size severely limits the generalizability of the results. A larger sample size would be needed to help verify the findings.</p>
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				<ul style="list-style-type: none"> <li>•Contrary to the hypothesis, there was little change in most secondary outcomes in the yoga group. (Secondary outcomes included asthma control, physical activity, breathlessness, and inflammation .)</li> </ul>	
<a href="#">Gülcan Bahçecioğlu Turan Mehtap Tan (2020)</a>	RCT	<ul style="list-style-type: none"> <li>• Yoga is an old Hindu practice. Its therapeutical effect has been documented in western countries and it means the perfect control of the body, feelings and the mind. Yoga consists of breathing exercises, asanas (poses), relaxation and meditation exercises</li> <li>• The study was completed with 112 people including two</li> </ul>	<p>This article studies whether yoga improves breathing function, symptom control, and quality of life as compared to no intervention . Asthma control tests were used to score the patients’ symptoms.</p>	<ul style="list-style-type: none"> <li>•When the post-test score averages of asthma control tests were compared between the groups, the difference between groups was found to be statistically significant and the post-test score averages of the experimental group were found to be higher when</li> </ul>	<ul style="list-style-type: none"> <li>•Study participants did not include those who are in an exacerbation period or exposed to any triggers during the course of the study. Therefore, it is still unknown whether yoga would help reduce an exacerbation or lessen the respiratory response to a patient’s</li> </ul>

		<p>groups of 56 people</p> <ul style="list-style-type: none"> <li>•A total of 12 yoga sessions, 2 sessions a week for 6 weeks, was applied to the patients in the experimental group. The patients in the control group did not receive any intervention.</li> </ul>	<p>compared with the control group (<math>p &lt; 0.05</math>)</p> <ul style="list-style-type: none"> <li>•When the post-test asthma Quality of life total and sub-dimensions average scores were compared between groups, average scores of the patients in the experimental group were found to be higher than those of the patients in the control group (<math>p &lt; 0.05</math>)</li> <li>•In the comparison of post test score averages of respiratory functions between groups, score averages of the experimental group were found to increase significantly when</li> </ul>	<p>inflammatory triggers.</p> <ul style="list-style-type: none"> <li>• The study did not compare yoga to other exercise or breathing programs (the control group received no intervention at all), so it is uncertain whether yoga is superior to other supplementary treatment plans.</li> </ul>
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				<p>compared with the control group (<math>p &lt; 0.05</math>)  Based on this finding, it can be said that application of yoga as a supplementary and integrated treatment in addition to pharmacological treatment has a positive effect on the recovery process of the disease.</p>	
<p><a href="#">Das, Rashmi R.</a>; <a href="#">Sankar, Jhuma</a>; <a href="#">Kabra, Sushil Kumar</a> (2019)</p>	Systematic review	<ul style="list-style-type: none"> <li>•A total of 10 trials (RCTs =9, Quasi-RCT =1) were included</li> <li>•A total of 466 children of 6 - 14 years age were included in the analysis.</li> <li>•The trials were conducted in New Zealand, Australia, Egypt, Turkey and India.</li> </ul>	<ul style="list-style-type: none"> <li>•Primary outcomes studied included quality of life and change in asthma symptoms or symptom scores.</li> <li>•Secondary outcomes included reduction in medication requirement , number of exacerbations, change in physiological measures</li> </ul>	<p>Two trials evaluated QoL, one (included both children and adults) at 3 months found a trend towards greater improvement in the intervention (BBT) group, whereas another at 1 month found no significant difference between the two groups. Three trials evaluated the</p>	<p>Data could not be pooled for the primary outcomes and most of the secondary outcomes due to lack of standard reporting of the outcome measures. Poor methodological quality of the included trials lead to unclear risk of bias in most of the trials.</p>

			<p>of lung function, and adverse events.</p>	<p>change in symptoms or symptom scores. One trial found a significant difference between the two groups, whereas two trials did not find a significant difference between the two groups. Results on the PEF percent change at 4-6 weeks were pooled from two trials and found a significant improvement favoring the intervention group. PEF absolute change (L/min) at 3 months has results pooled from two trials and found a significant improvement favoring the intervention group. Only one trial reported serious adverse</p>	<p>The method of administration of intervention and type of intervention varied among the trials so the optimal therapeutically effective type of breathing exercises and yoga/pranayama could not be determined. The trials evaluated children between 6-14 years of age making it difficult to make any recommendation outside this age group.</p>
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				events (hospital admission due to exacerbation) and found no difference between the intervention and control group.	
<p><a href="#">Shruti Agnihotri 1</a>, <a href="#">Surya Kant 1</a>, <a href="#">Satyendra Kumar Mishra 2</a>, <a href="#">Ajay Verma 1</a> (2017)</p>	RCT	<ul style="list-style-type: none"> <li>•The patients were included in the study having mild-to-moderate persistent bronchial asthma severity according to the GINA-2011, aged ranging between 12 and 60 years. They were nonsmokers or ex-smokers who have not smoked for at least 6 months and reversible airflow limitation &gt;12% and &gt;200 mL (postbronchodilator FEV1 &gt;12% and &gt;200 mL).</li> <li>•A total of 125 participants from “the Yoga group” and 130 participants from “the</li> </ul>	<ul style="list-style-type: none"> <li>•Quality of life was measured using a self-administered mini asthma quality-of-life questionnaire (AQLQ by Elizabeth Juniper, England) which is available in bilingual form, that is, English and Hindi. Scores assessed: symptom score, activity limitation score, emotional function score, response to environmen</li> </ul>	<ul style="list-style-type: none"> <li>•The results of this study suggest that both groups got significant improvement in 6-month study period compared to baseline scores but the improvement was achieved relatively earlier by “the Yoga group” in comparison to “the control group.”</li> <li>• “Between-group differences” at the 6th month were highly significant with better improvement in symptom</li> </ul>	<ul style="list-style-type: none"> <li>•Small sample size</li> <li>•Relatively short intervention period</li> </ul>

		control group” completed the study. •participants in “the Yoga group” received yogic intervention (Asanas, Pranayama and meditation) for 30 min per day, 5 days in a week for 6 months in the Department of Pulmonary Medicine	tal stimuli and total quality-of-life score.	score, activity limitation score, emotional function score, response to environmental stimuli and total quality-of-life score.	
Pallavi Yadav 1, Pankaj Kumar Jain 1, B S Sharma 2, Meenakshi Sharma 3 (2021)	RCT	Hospital based interventional RCT conducted at the Pulmonology division, Department of Pediatrics at tertiary care center of North India from November 2017 to October 2018. Total of 140 patients (70 in the intervention and 70 in the control group) ages 10-16 with newly diagnosed bronchial asthma as per Global Initiative for	Pulmonary function tests (FVC, FEV1, FEV1/FVC, PEFR) Quality of life was assessed with PAQLQ, a 23 item, self-administered assessment tool with three main topics: symptoms, emotional function, and activity limitation.	There was significant improvement in FEV1 and FEV1/FVC ratio after 12 weeks of yoga therapy compared to the control group. There was significant improvement in symptom-domain score in the intervention group compared to the control group at 12 weeks. There was not a statistically	This study did not assess the steroid sparing effects of yoga in the management of asthma, illness score, or compliance with medication while participating in yoga therapy. The study had a relatively small sample size and duration of intervention. If both of these were

		<p>Asthma guidelines were enrolled in the study. The intervention group did 45 minutes daily yoga, The first week was fully under the supervision of a yoga expert. Then 1 day with the expert and 6 days at home supervised by parents each week. All postures were performed for five minutes.</p>		<p>significant improvement in activity limitation and emotional function as compared to the control. The mean PAQLQ score improved in both groups compared to the baseline values.</p>	<p>greater, it would be more useful for making recommendation for future practice.</p>
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<p>Conclusion(s):</p>
<p>Article #1: The review found that yoga probably improves quality of life and asthma symptoms to some extent. However, confidence in the results is low as most of the studies were flawed in various ways. The effects of yoga on lung function were inconsistent, and a small amount of evidence indicated that yoga can reduce medication usage. Information on unwanted side effects was very limited; more studies are needed to assess this. High-quality studies involving large numbers of participants are required for us to be able to draw a firm conclusion about the effects of yoga for asthma.</p>
<p>Article #2: A yoga and mindfulness intervention is feasible, acceptable and improved health-related quality of life for people with severe asthma. From the patient’s perspective, exercise interventions for people with severe asthma may benefit from incorporating opportunities for social connection, having a flexible program structure, incorporating a shift in mindset, addressing breathing and asthma symptoms, and having multiple synergistic components. Studies to improve physical activity among people with severe asthma are needed, and this study is important in informing the design of future research.</p>
<p>Article #3:</p>

It was found that the patients' respiratory function values and symptom controls were positively influenced as a result of yoga application and their quality of life was found to increase.

Article #4:

Breathing exercises and yoga/pranayama may be a useful adjunct in the treatment of childhood asthma. At present, it cannot be recommended as a standard of care due to insufficient data. Further research with homogenous and higher quality designs are needed before definitive recommendations on the use of these alternative therapies as an adjunct to pharmacotherapy could be made in childhood asthma.

Article #5:

Yogic intervention improved the status of quality of life in patients with asthma. All the subdomains of quality of life including total scores significantly increased in both groups but the Yoga group in comparison to the control group achieved the improvement relatively earlier. Overall, this study shows that Yoga is an effective tool to improve the quality of life and it can be practiced as an adjuvant therapy to standard medical treatment for a better outcome of asthma.

Article #6:

While pharmacologic therapy is still the mainstay of treatment for asthma, yoga is beneficial as an adjuvant therapy. It not only improves pulmonary function but also overall health, as evidenced by the increase in quality of life scores.

Clinical Bottom Line:

The clinical bottom line is that while yoga practice may have a beneficial effect on quality of life for asthmatic patients, it has not been studied enough for any specific recommendations to be made. The Cochrane Review noted that they had low confidence in the results because the studies included had various flaws. The pilot RCT showed promising results, and can be used as a guide for further research, but its sample size was too small to draw any real conclusions. The RCT from 2020 did note positive results in respiratory symptoms and quality of life, however it was based on a small sample size of only 112 people (56 in each group). The systematic review pointed out that there is insufficient data, and great heterogeneity between the articles included in the review making pooled analyses difficult. The RCTs from 2017 and 2021 also did show positive results in the yoga intervention group, but they too had a small sample size.

It should be noted that none of the articles reported any major adverse events in the intervention group. They did not indicate that there were minor adverse events either. The provider for the 18-year-old patient in the original clinical scenario would need to explain to her that there is simply not enough high-level research indicating that yoga is an effective tool for improving quality of life for asthmatic patients. However, there have been some small studies that had positive results, without any major exacerbations reported. She can attempt a yoga regimen if she is interested in trying it out for herself, but she should not rely on it to improve her quality of life or reduce her asthma symptoms based on the information that is available to healthcare providers at this time.

Weight of Evidence:

Article 1: This article is a Cochrane review that was published in 2016. It has evidence based on 15 studies with large sample sizes. The total number of participants was 1,048 which was the most of all the studies I included in this research paper. The authors concluded that the data they found was moderate quality evidence that yoga can have a small improvement in patients' quality of life and symptom control.

Article 4 This article is a systematic review that was conducted in 2019, making it both recent and based on the highest level of research. It is based on 10 articles with an overall total of 466 participants. This large sample size adds to the weight of the evidence. It is not placed the highest on my list, even though it is more recent than the Cochrane Review, because its total number of participants is still much smaller, and I think the larger sample size carries more weight in this case. It does have a strong pool of sources, because the trials included were conducted in New Zealand, Australia, Egypt, Turkey and India, showing that the results are not necessarily culture or area dependent.

Article 5: This randomized control trial was conducted in 2017, 255 participants between the ages of 12 and 60 years old completed the full course of the study (125 in the intervention group and 130 in the control group). I weighed this article higher than Article 6 because it has more participants. I also think this article added a lot of value because it tracked the participants over 6 months, which is a significant length of time in which to evaluate if the intervention group truly improved more than the control.

Article 6: This is a randomized control trial that is in preprint to be published in November 2021. It is the most recent article in this CAT, however it is ranked lower than other RCTs due to its sample size. 70 participants were in the case and control groups. The fact that the participants in the intervention group practiced 45 minutes of yoga daily, and had an expert yoga instructor supervising them weekly added weight to this article because it is more certain that the participants were doing the poses correctly and sticking with the program. Also, testing the participants' pulmonary function three times (beginning, at 6 weeks, and then at 12 weeks) gives quantifiable results that are important for future studies.

Article 3: This is a randomized control trial published in 2020. It is weighted second to last because of its sample size of 112 participants (56 each in the case and control groups) Also, the participants in the intervention group only had a total of 12 yoga sessions, which were twice a week for six weeks. This is significantly less than in article 6, so therefore it is ranked lower.

Article 2: This is a pilot randomized control trial from 2021. It was conducted intentionally with a small sample size (15 in the intervention group and 9 control) to determine if this type of trial would be feasible, and if so, devise guidelines for how to replicate it on a larger scale. This makes it valuable for future research, however the small sample size does limit the generalizability of its results. In addition, the study ran for 16 weeks, which is less than the 6 months of article 6.

Magnitude of any effects:

All of the articles noted above all came to generally the same conclusion that yoga may be helpful in improving quality of life and reducing symptoms in patients with asthma, without any major adverse events. The articles varied greatly in sample size (from a Cochrane Review with 1,048 participants to a pilot RCT with only 56 members in each group.) Some articles focused only on younger patients, which would make their results be more tailored to that age group, however, in general, I would consider the magnitude of the combined results of these articles to be in favor of yoga as adjunctive therapy for asthma.

**Clinical Significance:**

The clinical bottom line that I have derived from these articles is that patients with asthma would not be harmed, and may feel an improvement in their symptoms with yoga as an adjunct to standard treatment. Each article individually noted that more research with more robust sample sizes and more standardized duration of treatment and regiment of intervention are needed in order to form a strong recommendation for yoga in patients with asthma. Therefore, it should not be recommended by providers as a guaranteed way to improve quality of life and pulmonary function but may be suggested to patients who are interested in trying it anyways.

**Other considerations:**

Yoga is relatively inexpensive, there is no specific equipment or location that is necessary to practice it. Therefore, it may be a helpful adjunct therapy for patients from lower socioeconomic backgrounds. Once a patient is taught the proper positions and breathing techniques they can continue performing them on their own long-term. Many patients may feel empowered by having a physical activity which they can do to help calm themselves and increase their flexibility, regardless of their asthma status. Yoga is known to improve quality of life in the general public, and with no major adverse events reported it is certainly an area that would be beneficial to study further.