

*Original Article***To Evaluate the Impact of Pranayama and Meditation on Psychological Disorders in Patients with Bronchial Asthma**Shruti Agnihotri<sup>1</sup>, Surya Kant<sup>2</sup>

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**Correspondance:** [saishruti.agnihotri@gmail.com](mailto:saishruti.agnihotri@gmail.com)**Received:** 9/5/2020; **Revised:** 1/6/2020; **Accepted:** 5/6/2020**Key words-** Adjuvant; anxiety; asthma; depression; psychological variables; stress**[citation:** Agnihotri, Shruti. and Kant, Surya. (2020). To Evaluate the Impact of Pranayama and Meditation on Psychological Disorders in Patients with Bronchial Asthma. DHH, 7(2):[https://journalofhealth.co.nz/?page\\_id=2158](https://journalofhealth.co.nz/?page_id=2158)].**ABSTRACT**

**Background and Objective-** Asthma is one of the commonest respiratory diseases as well as a significant disease burden worldwide costing billions of dollars. Anti-asthmatic drugs are the only treatment method for the disease but they are expensive and have adverse effects. Thus, it is prudent to look for an adjunct therapy to alleviate these problems. No previous studies have explored the impact of pranayama and meditation on psychological disorders in asthma patients. The main aim of this study is to evaluate such an impact. **Methods** - a randomized controlled study was carried out from April 2018- September 2019. Asthma patients aged between 18 to 70 years were recruited from the Department of Respiratory Medicine, King George's Medical University, U.P., Lucknow, India. They were randomly divided into two groups: 'the case group and 'the control group'. Their assessment was done at baseline, at 4<sup>th</sup> months, and 8<sup>th</sup> months. **Results** - there was significant improvement in the yoga group at 8 months compared to baseline and control group scores in depression, anxiety and stress level. **Conclusion** - 'The yoga group' experienced significantly better improvement in psychological variables than 'the control group'. This suggests that as adjuvant therapy with standard medical treatment, yoga may be beneficial in management of asthma.

**INTRODUCTION**

Asthma is a common chronic inflammatory respiratory disorder characterized by hypersensitivity of the airways and reversible, episodic airway obstruction [1]. Typical symptoms of asthma include wheezing, coughing, chest tightness, and dyspnoea (shortness of breath). In addition to physiologic dysfunction, many people with asthma also suffer from psychological distress in the form of depression, anxiety, and emotional disorders [2-3]. The prevalence of asthma has increased dramatically over the past decade. Globally, asthma affects about 300 million people, and this figure continues to rise [4-5]. Asthma represents a huge economic burden on society. In the USA, the management of asthma costs more than USD 12.7 billion per year [6].

Yoga originated in ancient India and remains an important aspect of India's diverse culture. Yoga includes such common components as breathing exercises (pranayama), postures (asanas), and meditation (dhyana) [7]. Yoga is a non-pharmacological adjunct to conventional therapy for asthma. Yoga has been considered as a form of Complementary and Alternative Medicine [8]. The word "yoga" comes from a Sanskrit root "yuj" which means union, or yoke, to join, and to direct and concentrate one's attention [9-10]. Regular practice of yoga provides strength, endurance, flexibility and facilitates characteristics of friendliness, compassion, and greater self-control, while cultivating a sense of calmness and well-being [11-12]. The practice of yoga produces a psychological state opposite to that of the fight and flight stress response and with that interruption in the stress response a sense and harmony between mind and body is achieved.

Yoga is known for its beneficial effects on physiologic and psychologic functions and improves the quality of life of patients [13-21]. The present study is a split form of study based on the findings of one of the aims of a larger study on bronchial asthma.

**OBJECTIVE** - To evaluate the impact of pranayama and meditation on psychological disorders in patients with Bronchial Asthma.

## MATERIALS AND METHODS

**STUDY DESIGN AND SETTING** - This study was a randomized controlled trial, conducted from April 2018- September 2019 in the Department of Respiratory Medicine, King George's Medical University, U.P., Lucknow, India. Diagnosed cases of asthma were recruited from the Out Patient Department (OPD) and screened by a consultant for participation in the study on the basis of inclusion & exclusion criteria.

Patients included in the study had mild to moderate persistent bronchial asthma severity according to GINA- 2018 and a depressive disorder due to asthma. The age of the patients ranged between 18-70 years. They were non-smokers or ex-smokers who had not smoked for at least 6 months and had reversible airflow limitation  $>12\%$  &  $\geq 200$  mL (Post Bronchodilator  $FEV_1 >12\%$  &  $\geq 200$  mL). Patients were excluded if they had severe airflow limitation ( $FEV_1 < 60\%$ ), any associated chronic respiratory diseases, or were pregnant or breastfeeding

**STUDY PARTICIPANTS** - 325 subjects who satisfied the inclusion criteria were randomly allocated to case (yoga) or control (standard) groups. This sample size provides a 90% power at 5% level of significant for the t-test. The yoga group received yogic intervention for 8 months along with standard medical treatment, and the control group received only standard medical treatment. Out of 325 subjects (165 cases and 160 controls), 15 subjects from the yoga group and 10 subjects from the control group dropped out during the study period. 150 subjects from the yoga group and 150 subjects from the control group completed the study.

**DATA COLLECTION** - DAAS 21 questionnaire (Manual for the Depression Anxiety & Stress Scales) Sydney: Psychology Foundation) was used to measure any effect on depression, anxiety and stress. The Depression, Anxiety and Stress Scale - 21 Items (DASS-21) are a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress. Each of the three DASS-21 scales contains 7 items, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest / involvement, anhedonia and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive and

impatient. The DASS-21 is based on a dimensional rather than a categorical conception of psychological disorders.

**Yogic Intervention** - Subjects in the yoga group received yogic intervention (pranayama & meditation, see Table 1) for 35 min per day, five days in a week for a period of 8 months.

**Data Analysis** - Paired *t*-test was used to test the mean difference score of the subjects at baseline, after four months and eight months in both groups i.e., yoga and control groups. Student's independent sample *t*-test was used to compare the differences in scores between groups (yoga) and controls (non- yoga group). Differences were considered significant if  $p \leq 0.05$ .

Yogic Techniques	Duration (min)
Pranayama	15
Nadishodhan	5
Bhastrika	5
Bhramari	5
Meditation	20
Total Duration	35 min.

	Cases	Controls			
Psych. disorders	mean±SD	mean±SD	Effect Size	t- value	p- value
Depression	14.75 ± 8.38	15.25 ± 6.70	0.065	0.508	0.006
Anxiety	15.25 ± 12.31	16.25 ± 14.71	1.45	0.638	0.52
Stress	20 ± 9.20	19.5 ± 7	0.061	0.528	0.29

\* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$  based on *post hoc* pair-wise comparison with baseline values.

**RESULTS** - Variables of psychological disorders at baseline in between group comparison are given in Table 2. Both groups are comparable in every respect and there was no significant difference found in any variable. The values of outcome measures are given in Table 3, 4, 5 and 6.

Between groups comparisons after 4<sup>th</sup> month and 8<sup>th</sup> month are given in Table 3 and 4, respectively. There was a significant difference between the yoga and control groups in depression and anxiety at the 4<sup>th</sup> month, and in depression, anxiety and stress at 8<sup>th</sup> month [Table 3 and 4]. Within group pre and post intervention changes at the 4<sup>th</sup> month and 8<sup>th</sup> month are given in Table 5 and 6 respectively. Much higher percentage-improvements at the 4<sup>th</sup> month and 8<sup>th</sup> month within the yoga group than control group can be observed. There was no significant change found in anxiety and stress level of control group from baseline at 4 months.

	Cases	Controls			
<b>Psych. disorders</b>	<b>mean±SD</b>	<b>mean±SD</b>	<b>Effect Size</b>	<b>t- value</b>	<b>p- value</b>
Depression	12.07 ± 6.73	14.52 ± 7.25	0.23	0.303	0.002
Anxiety	13.6 ± 8.36	15.38 ± 9.63	4.35	1.71	0.08
Stress	18.24 ± 5.08	18.35 ± 6.24	0.12	0.167	0.86

\**P* < 0.05, \*\**P* < 0.01, \*\*\**P* < 0.001 based on *post hoc* pair-wise comparison with baseline values.

	Cases	Controls			
<b>Psych. disorders</b>	<b>mean±SD</b>	<b>mean±SD</b>	<b>Effect Size</b>	<b>t- value</b>	<b>p- value</b>
Depression	8.35 ± 4.21	14 ± 9.65	0.6	0.508	0.003
Anxiety	10.14 ± 6.25	13.14 ± 8.32	8.45	73.26	0.0001
Stress	15.32 ± 9.20	17.5 ± 6.17	0.061	0.528	0.01

\**P* < 0.05, \*\**P* < 0.01, \*\*\**P* < 0.001 based on *post hoc* pair-wise comparison with baseline values.

As seen in Table 6, both groups have significant improvement after 8 months. In the yoga group, depression level significantly improved by 43.38%, and anxiety levels and stress levels significantly improved by 33.5% and 23.4% respectively. There was a significant improvement of 8.19% in depression levels, anxiety and stress also improved significantly by 19.14% and 10.26% respectively in the control group.

**DISCUSSION** - The results of this study suggest that over the 8 month study period, there was significant improvement from baseline scores in the yoga group, while the control group displayed a small improvement in depression, anxiety and stress level.

Asthma has long been associated with symptoms of mood and anxiety disorders [22-23]. Available studies show that the prevalence of anxiety and depressive disorders is more elevated among asthma patients than in the general population. However, the association of mental health problems with asthma severity is controversial. Some studies have shown significantly higher levels of anxiety and depression in patients with severe asthma as compared to those with milder disease, while other studies did not detect such differences [24-25].

Clinical data has shown that the presence of psychiatric and psychological symptoms is associated with increased severity of asthma symptomatology, health service use and costs, functional impairment and poorer asthma control [26-29].

**Table 5:** within group differences after 4th month

Psych. disorders	Cases				Controls			
	At baseline	4 month	% change	p-value	At baseline	4 month	% change	p-value
Depression	14.75 ± 8.38	12.07 ± 6.73	18.16	0.002**	15.25 ± 6.70	14.52 ± 7.25	4.79	0.0007***
Anxiety	15.25 ± 12.31	13.6 ± 8.36	10.82	0.05*	16.25 ± 14.71	15.38 ± 9.63	5.35	0.24
Stress	20 ± 9.20	18.24 ± 5.08	8.8	<0.0001	19.5 ± 7	18.35 ± 6.24	5.89	0.48

\*P < 0.05, \*\*P < 0.01, \*\*\*P < 0.001 based on *post hoc* pair-wise comparison with baseline values.

**Table 6:** Comparison of pre-post changes occurred in cases and controls after 8 month

Psych. disorders	Cases				Controls			
	At baseline	After 8 month	% change	p-value	At baseline	At 8 month	% change	p-value
Depression	14.75 ± 8.38	8.35 ± 4.21	43.38	<0.0001	15.25 ± 6.70	14 ± 9.65	8.19	0.009
Anxiety	15.25 ± 12.31	10.14 ± 6.25	33.5	<0.0001	16.25 ± 14.71	13.14 ± 8.32	19.14	<0.0001
Stress	20 ± 9.20	15.32 ± 9.20	23.4	<0.0001	19.5 ± 7	17.5 ± 6.17	10.26	0.01*

\*P < 0.05, \*\*P < 0.01, \*\*\*P < 0.001 based on *post hoc* pair-wise comparison with baseline values.

Depression may be significantly worse among severe asthmatics compared to those with less severe asthma, and lower levels of asthma control might explain the greater degree of depressive symptoms in severe asthma.

A cross-sectional study conducted at the Asthma Outpatient Clinic of the Federal University of São Paulo Hospital São Paulo [30] show how the prevalence of anxiety is higher in patients with uncontrolled asthma than in those with controlled asthma.

The available evidence suggests that asthma may precede and predispose to the development of anxiety and mood disorders, but also that the presence of psychological and behavioural problems may precede and predispose to asthma [31].

**CONCLUSION** - The study shows that the yogic intervention significantly improved the variables of psychological disorders. Overall, this study shows that yoga is an effective tool to improve the status and quality of life of the patients. Therefore, it can be practiced as an adjuvant therapy with standard medical treatment.

**SUGGESTIONS FOR FUTURE WORK** - it is recommended to replicate this study with much larger sample using a multi-centre RCT in order to verify and confirm conclusions to develop a best practice.

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**Conflicts of interest-** None

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