

# A Study On The Effect Of Online Bhramari Pranayama On Depression Anxiety And Stress In Nursing Students.

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## Abstract

### Introduction

Bhramari is derived from the word 'Bhramar', meaning wasp. The self-induced humming sound in this practice parallels the technique of mantra repetition as we look into the advantages of this pranayama. Through prolonged exhalation and short inhalation, Bhramari pranayama shifts the natural breathing rhythm, significantly affecting the physiological system.

### Materials and methods

The aim of our study was to compare the effectiveness of the online practice of Bhramari pranayama on depression, anxiety, and stress levels in young adult female nursing students. This experimental study was done on 60 young female subjects of age group 17-23. The subjects were randomly and equally grouped into experimental and control. The experimental group received the Bhramari pranayama for a period of 21 days whereas the control group received no intervention. Depression, Anxiety, Stress, Attention, and Breath-holding capacity were assessed before the practice and after completing the practice. The Bhramari pranayama section was given to the experimental group (30) for 10 minutes daily for 21 days through Google Meet. The session was conducted everyday morning from 8.20 to 8.30 am before breakfast. Clear instruction was given before the practice of Bhramari. The instructor and subjects were online and were present in video during the practice session.

### Results

Online Bhramari pranayama significantly reduces depression anxiety and stress, ( $p < 0.05$ ) and increases the breath-holding capacity and attention ( $p < 0.05$ ).

### Conclusion

It has been observed that practicing Bhramari pranayama online has an affirmative effect in reducing depression anxiety, and stress, and increasing the breath-holding capacity and attention in young adults.

**Key words;** Online Bhramari, Bhramari pranayama, stress, depression.

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## I. Introduction

Bhramari is derived from the word 'Bhramar' in Sanskrit, meaning wasp. It is called Bhramari pranayama because of the humming sound that is produced during the expiration that mimics the flying wasp.<sup>(1)</sup>

The self-induced humming sound in this practice parallels the technique of mantra repetition as we look into the advantages of this pranayama. Through prolonged exhalation and short inhalation, Bhramari pranayama shifts the natural breathing rhythm, creating a major effect on the physiological system.<sup>(1)</sup>

Bhramari pranayama can induce a meditative state thus it can be considered as a form of meditation.<sup>(2,3)</sup>

Stress is a natural physical reaction to events that cause you to feel threatened or in any way upset your equilibrium. In a rapid automatic mechanism known as the "fight-or-flight-or-freeze" reaction -or the stress response, when you feel your body's defences kick into high gear.<sup>(4)</sup>

Stress may cause or exacerbate heart disease, anxiety, depression, hypertension, alcohol abuse and gastrointestinal disorders.<sup>(5)</sup> Stress affects the rate of absenteeism and work results, productivity and satisfaction.<sup>(6)</sup> The stress has detrimental effects by reducing a person's capacity for attention, concentration and decision-making skill of a person.<sup>(7)</sup>

It is often thought that stressful life events, episodes of anxiety and depression contribute to a distinctive stress response involving constant arousal and decreased function.<sup>(8)</sup> The definition of a stress response is called an affective or emotional condition and has a strong affinity with anxiety.<sup>(9)</sup>

Epinephrine, serotonin, dopamine, glutamate and the other main neurotransmitters involved in the neurological process are known to be modulated by nitric oxide.

The vital capacity is also improved by humming exercises. Compared to the entire exhalation, humming is estimated to raise the endogenous generation level of nitric oxide by 15-fold.<sup>(10)</sup>

The young adults are in the transition phase between childhood and adulthood. They face a lot of stress from a multi-dimensional perspective; physical stress, mental and emotional stress, and social stress to accommodate the changes that affect them in their social environment. They face elevated levels of anxiety at this age. There is also evidence that the practice of yoga and pranayama helps to alleviate and control the tension of everyday life activities.<sup>(11)</sup>

In this aspect our study aimed to compare the effectiveness of the online practice of Bhramari pranayama on breath-holding time, depression, anxiety, and stress levels in young adult female nursing students.

## **II. Materials and methods**

This experimental study was done on 60 young female subjects of age group 17-23. The subjects were randomly grouped into experimental and control with 30 subjects in each group. The experimental group received the intervention for a period of 21 days whereas the control group received no intervention. The study was approved by the institutional ethical committee and the detailed procedure was explained to the subjects before starting the study and all the participants gave the signed informed consent. Those students who were absent for three consecutive days or absent for more than 5 days in the entire session were excluded. Students who had ear infections, and recent surgeries in the ear and para nasal sinuses were excluded from the study.

### ***Parameters assessed.***

Depression, Anxiety, Stress, Attention and Breath holding capacity were assessed by the subjects before the practice and after completing the practice.

### ***Measurement tools***

#### ***DASS 21 Questionnaires for depression, anxiety, and stress:***

The DASS-21 questionnaire is a set of three self-report scales designed to measure the emotional states of depression, anxiety, and stress. There are 7 items in each of the three DASS-21 scales, split into subscales of similar content. The depression scale measures dysphoria, hopelessness, existence devaluation, self-deprecation, loss of interest/participation, inertia and Anhedonia. The anxiety scale evaluates autonomic arousal, skeletal muscle effects, situational effects, and subjective experience of anxious affect. The stress scale is susceptible to persistent nonspecific arousal levels. It evaluates relaxing difficulty, nervous arousal, and being easily upset/agitated, irritable /Impatient and over-reactive. Depression, anxiety and stress scores are calculated by summarising the scores for the things appropriate. DASS-21 is based on a dimensional model of psychiatric conditions rather than a categorical concept.<sup>(9)</sup>

***Mindfulness attention scale for mindfulness anxiety:*** The mindfulness attention Scale for Conscientious Attention (MAAS) is a brief and simple to manage scale that primarily tests the dispositional capacity of the person to be aware and conscious of experiences of everyday life. This is a single-factor self-reported 15-item scale that is the emphasis exclusively on the attention/awareness portion of Constructing mindfulness. The instrument can be used independently of itself. Used either with or without meditation, to test people's experience and is commonly used in mindfulness research.<sup>(12)</sup>

***Breath assessment:*** Through the Google meet platform contacted each student separately. and took 3 readings of breath holding and took average of three.

### ***Bhramari procedure***

The Bhramari pranayama section was given to the experimental group (30) for 10 minutes daily for 21 days through Google Meet after obtaining consent. The section was conducted everyday morning from 8.20-8.30 am before breakfast. Clear instruction was given before the practice of Bhramari. The instructor and subjects were online and were present in video during the practice session.

The experimental group subjects were made to sit with their eyes closed in a relaxed pose with an upright spine. At this stage, slow and deep inhalation through both nostrils (5 seconds) was requested, followed by deep and slow exhalation in the same manner (15 seconds) with their index finger on two external auditory channels. They are advised to recite the Makara mantra while exhaling, along with a humming nasal sound similar to that of a wasp. On the laryngeal walls and the interior walls of the nostrils, it causes mild vibration. This full procedure is at the rate of 3-4 / min with one-minute rest to complete one cycle.<sup>(11)</sup>

### III. Results

Parameters were analyzed and data was collected from the experimental and control groups before starting the study and after 21 days. The data was analyzed by using a paired t-test/ Wilcoxon signed rank test.

**Table 1:** Pre-post comparison of breath assessment among the study groups

Within group Comparison of breath assessment	Pre-test	Post-test	T value	P value
	Mean±sd	Mean±sd		
Interventional Group	28.53±5.42	22.53±5.42	4.15	<0.001
Control group	30.26±7.53	29.68±7.51	2.77	0.210

Paired T-test, p<0.05 shows statistical significance

Table 1 shows a pre-test to post-test comparison of breath assessment scores for both the intervention group and control group. We have observed a decrease in average breath scores from the pretest to post test for both the interventional and control groups. The difference observed from average pre test to post test scores was highly statistically significant among both groups (p<0.05).

**Table 2:** Pre-post comparison of anxiety assessment among the study groups

Within group comparison of anxiety assessment	Pre test Mean±sd	Post test Mean±sd	P value
anxiety Interventional Group	7.47±4.53	5.07±3.7	0.034*
anxiety Control group	7.04±4.29	7.41±3.69	0.682
Depression Interventional Group	6.33±4.01	4.83±3.24	0.019*
Depression Control group	6.33±3.22	8.23±4.53	0.016
Stress Interventional Group	7.23±3.68	5.7±3.46	0.039
Stress Control group	7.27±3.33	7.8±3.12	0.432

Paired T test, p<0.05 shows statistical significance,\* shows a significant reduction from per test values

Table 2 shows the pretest to posttest comparison of anxiety assessment scores for both the intervention group and the control group. We have observed a decrease in average anxiety score from pretest to post test in the interventional group and the observed difference was statistically significant (p<0.05). In the control group we observed a slight increase in the post-assessment period and the minor difference observed was not statistically significant (P>0.05).

pretest to posttest comparison of depression assessment scores for both the intervention group and control group. We have observed a decrease in average depression score from pretest to post test in the interventional group and the observed difference was statistically significant (p>0.05). In the control group we observed an increase in the post assessment period and the difference observed was statistically significant (P<0.05). We have observed a decrease in average stress score from pretest to post-test in the interventional group and the observed difference was statistically significant (p>0.05). In the control group, we observed an increase in the post-assessment period and the difference observed was not statistically significant (P>0.05).

**Table 3:** Pre-post comparison of mindfulness attention among the study groups

Within group Comparison of Mindfulness Attention	Pre-test	Post test	T value	P value
	Mean±sd	Mean±sd		
Interventional Group	3.47±0.86	4.52±0.92	4.716	<0.001
Control group	3.46±1.25	3.68±1.04	0.947	0.352

Paired T test, p<0.05 shows statistical significance

Table 3 shows the pretest to posttest comparison of mindfulness attention assessment scores for both the intervention group and the control group. We have observed an increase in average attention score from pretest to post test in the interventional group and the observed difference was statistically significant (p<0.05). In the control group the difference observed was not statistically significant (P>0.05).

#### **IV. Discussion**

After the practise of Bhramari in the intervention community, the breath holding capacity increased significantly. Increase in breath holding capacity may be due to voluntary prolongation of inspiration and expiration during pranayama, which extended the respiratory muscles to their full extent and allowed the respiratory apparatus to function to their maximum capacity and also due to the more efficient use of diaphragmatic and abdominal muscles during the chanting of Bhramari. Improvement of the function of the respiratory muscle helps to reduce the muscle's relative load and increase maximum sustained ventilatory capacity. This is supported by a previous study on Bhramari pranayama and OM chanting. The slow breathing technique of Bhramari and OM chanting may be useful to promote sympathovagal balance and that may help in attaining mindfulness attention. Slow and deep breathing has a calming effect on the mind that also helps to relieve stress<sup>[13,14]</sup>

Yoga practices might interact with various, some-neuroendocrine mechanisms and it can be used as psychophysiological stimuli to increase endogenous secretion of melatonin, which improves the sense of well-being. By reducing perceived stress and anxiety, yoga eases respiration and it can be beneficial in the prevention and cure of diseases<sup>[14]</sup>

Previous studies on bhramari and nitric oxide prove that, Epinephrine, serotonin, dopamine, glutamate, and the other main neurotransmitters involved in the neurological process are known to be modulated by nitric oxide, so it may help in reducing depression anxiety and stress levels along with overall well-being<sup>[10]</sup>. From previous studies it is evident that relaxation and chanting practises effectively reduced depression anxiety stress and improves breath rate and heart rate variability. The chanting practice Bhramari did the same effect in our study.<sup>(15,16,17)</sup>

It was found that there were remarkable changes occurs in their stress anxiety depression level and improvement in the attention scale and there was a substantial increase in their breath holding capacity. This has been observed that the nursing students were more relaxed and comfortable in their duties.

#### **V. Conclusion**

The study was conducted to find out the importance of online Bhramari practice on stress anxiety, depression, breath holding capacity and attention among nursing students. It has been observed that practicing Bhramari pranayama online has an affirmative effect in reducing depression anxiety, and stress, and increasing the breath holding capacity and attention. This will help to improve their efficiency at patient care.

#### ***Strength of the study***

From this study it is evident that the online practice of bhramari is effective in reducing depression anxiety and stress. From our knowledge there are fewer studies done to find out the effectiveness of online practices. So this study sheds light on the importance of online practices.

#### ***Limitations of the study***

Males were not included in this study. This study included only 60 participants. The sample size can be increased for better results. The duration of the study is only 21 days. Though the duration of the intervention was short, significant improvements were found in breath-holding capacity, anxiety depression, stress, and mindfulness attention so the study should be conducted in larger samples for better results.

#### ***Conflict-of-Interest***

No conflict of interest were stated on this study.

#### ***Acknowledgments;***

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