



# Effect Of Breathing Techniques On Strss And Anxiety Among Teachers

Preeti Rana (student)

Dr. Seema Rani Sarraf (Assistant Professor)

Amity Institute of Behavioural and Applied Sciences

Amity University Lucknow Campus

Uttar Pradesh, India

## Abstract

Teaching is often considered a demanding profession, and many teachers experience high levels of stress and anxiety because of heavy workloads, time constraints, and the emotional responsibilities involved in working with students. When stress becomes continuous, it can affect teachers' mental health, job satisfaction, and overall quality of life. In recent years, breathing techniques have been increasingly recognized as a simple and practical way to help manage stress and anxiety.

A pre and post test was implied to check the impact of breathing techniques on stress and anxiety level among teachers.

The ANOVA findings indicate that the intervention was effective in significantly reducing stress and depression, while the reduction in anxiety, though present, did not reach statistical significance. These results partially support the effectiveness of the intervention in improving psychological well-being among participants.

**KEYWORDS:** Breathing techniques, pranayama, stress, anxiety, depression, mindfulness, psychological well-being, intervention, pre-post test, ANOVA, relaxation response, autonomic nervous system

## 1. INTRODUCTION

Breathing as a Biological "Shape-Shift" While we often think of breathing as just air moving in and out, from a physiological standpoint, it is actually a constant, rhythmic change in the body's shape. Our torso is essentially a two-story house: the thoracic cavity on top (home to the heart and lungs) and the abdominal cavity below (housing the stomach, liver, and kidneys). These two spaces are separated by the diaphragm, but they share a common anchor in the spine. Because these cavities are flexible, their ability to expand and contract is the true engine of life. Without this physical "shape-shifting," the lungs would have no way to draw in the oxygen we need.

## The High-Pressure Classroom

A Case for "Bio-Hacking" In a typical Indian school, a teacher is often navigating a "perfect storm" of demands. From managing fifty students in a single room to juggling the digital paperwork required by the National Education Policy (NEP) 2020, the pressure is relentless. In these moments, teachers often fall into thoracic breathing—those shallow, rapid gasps from the upper chest. This isn't just a bad habit; it's a signal to the brain that the body is in "fight-or-flight" mode, making it nearly impossible to stay calm. To combat this, we can use the breath as a "portable clinic" through two specific methods:

### The Vagal Brake (Diaphragmatic Breathing)

By intentionally pushing the breath deep into the belly, a teacher performs what is essentially a vagal maneuver. As the diaphragm drops, it physically presses on the Vagus nerve. The Internal Shift: This physical contact triggers a biochemical reset, slowing the heart rate and flushing out salivary cortisol. The Result: It moves a teacher from a state of "reactive frustration" back to "cognitive clarity." It's the difference between snapping at a student and having the patience to mentor them

### Tactical Stillness (Box Breathing) Commonly known as Sama Vritti

This technique uses a four-part square: inhale, hold, exhale, and hold again—usually for a count of four. The Science: These brief "holds" are critical because they slightly raise the levels of carbon dioxide ( $CO_2$ ) in the blood. This triggers the Bohr Effect, which actually helps the blood release oxygen more efficiently into the brain's tissues. The Result: By stabilizing the Pre-Bötzinger Complex (the brain's internal pacemaker), this practice stops "racing thoughts" in their tracks, providing a moment of calm during a chaotic day

### Mapping the Stress Landscape

The "father of stress research," Hans Selye, famously defined stress as the body's non-specific response to any demand. For an educator, this isn't just one feeling, but a spectrum : Acute Stress: The sudden spike of an unannounced inspection. Episodic Acute Stress: The "constant fire-fighting" caused by a chaotic schedule. Chronic Stress: The long-term exhaustion of systemic pressure that leads to burnout. When these states aren't managed, they solidify into anxiety—a persistent, heavy worry about what might happen next.

### The Long History of a Restless Mind

Anxiety isn't a "new-age" problem. It has been part of the human experience since we first stepped into organized society. Over two thousand years ago, Greco-Roman thinkers like Hippocrates and Cicero were already observing patients who suffered from "irrational terrors" and constant, gnawing worry. It wasn't until 1894 that Sigmund Freud formally pulled anxiety out of the realm of philosophy and into medicine, describing "free-floating anxiety" as a distinct psychological condition.

To understand the "Silent Crisis" currently haunting our staffrooms, we need to look past the piles of notebooks and see the actual person standing at the chalkboard. In the Indian education system, anxiety isn't just a clinical term—it has become a daily shadow for those in the profession. We've essentially forced our educators to leap from the ancient, steady role of the Guru into a high-speed, corporate model obsessed with metrics. This shift hasn't just changed the job; it's turned the classroom into a psychological pressure cooker.

In a culture where a teacher's worth is often stripped down to board exam percentages, the classroom stops being a place of curiosity and starts feeling like a high-stakes arena.

This environment breeds what we call high-functioning anxiety. On the outside, these teachers look perfectly composed, punctual, and in total control. But internally, they are running on the fumes of nervous energy, battling a racing heart and a constant loop of "what-if" scenarios. They aren't just teaching; they are surviving, terrified that a single bad test cycle could dismantle years of professional respect.

This isn't just a technical hiccup; it's a direct hit to an educator's sense of competence. It creates a "performance anxiety" that makes even the most seasoned teacher feel like a nervous beginner again, leading to a strange sense of isolation in the middle of a crowded school. This keeps the nervous system locked in "fight-or-flight" mode long after the final bell has rung. It's why so many teachers feel "wired but tired"—they are physically spent, yet their brain refuses to let them rest because it still believes they are under attack.

Since then, we've moved away from seeing it as a "physical disease" or a character flaw. We now understand it as a complex survival mechanism—a "smoke detector" in the brain that sometimes gets stuck in the "ON" position.

While ancient philosophers once called this "melancholia," we now know it as a physiological state that can completely drain a teacher's professional effectiveness.

From "Guru" to Modern Professional the role of the Indian teacher is currently in a state of flux, caught between the ancient, revered status of the Guru and the high-tech, results-driven world of modern EdTech. With over 75% of Indian educators reporting frequent symptoms of stress, we are facing a silent crisis. Since mental health resources are often scarce or stigmatized in schools, these breathing techniques are vital "bottom-up" interventions. By slowing the breath to roughly six cycles per minute, a teacher can manually override their nervous system, moving out of panic and back into autonomic homeostasis. Ultimately, just five minutes of this "breath-work" can measurably lower stress enzymes like alpha-amylase. It transforms an ancient spiritual tradition into a clinical, real-time tool, ensuring that those who are busy shaping the next generation have the tools to protect their own mental health.

## RATIONAL OF THE STUDY

Breathing as a Biological "Shape-Shift" While we often think of breathing as just air moving in and out, from a physiological standpoint, it is actually a constant, rhythmic change in the body's shape. Our torso is essentially a two-story house: the thoracic cavity on top (home to the heart and lungs) and the abdominal cavity below (housing the stomach, liver, and kidneys). These two spaces are separated by the diaphragm, but they share a common anchor in the spine. Because these cavities are flexible, their ability to expand and contract is the true engine of life. Without this physical "shape-shifting," the lungs would have no way to draw in the oxygen we need. One of the most widely recognized tools are breathing techniques for relaxation and emotional stability. They help in regulating our autonomic nervous system and by activating natural relaxation responses. Even though there are many different techniques, breathing techniques are easy to learn and practice and does not require any special equipments or skills, and one of the most important factor is that teachers have limited period of free time so it will not be a type of burden but a type of relaxation time period for them.

The aim of this study is to understand and help how teachers can reduce stress and anxiety through breathing techniques there are different studies also, but this study mainly aims on which breathing technique is more effective and how it can help teachers deal with daily burden of stress and anxiety in their life. The result may lead to interventions in school for teachers to help them relax and maintain their mental health without being overwhelmed by certain conditions

## OBJECTIVES OF THE STUDY

Objective 1 : To examine the level of stress and anxiety among teachers

Objective 2 : To examine the effect and pre and post difference of box breathing on stress and anxiety among teachers

Objective 3 : to examine the effect and pre and post difference of diaphragmatic breathing technique on stress and anxiety level among teachers

Objective 4: to compare both the breathings techniques to know which is one is more effective

## **HYPOTHESES**

**H1** : There will be a significant difference or reduction in stress level among teachers after practicing the technique

**H2** : There will be a significant difference or reduction in anxiety level among teachers after practicing breathing technique

**H3** : There will be a comparison between which breathing technique is more effective than the other one

## **II. LITERATURE REVIEW**

### **Breathing-Based Interventions with Teachers**

A small number of studies have examined breathing practices specifically for reducing stress among teachers. One recent study by Hallez et al. (2025) explored the effects of slow-paced breathing, often called coherence breathing, among primary school teachers in France. In this study, 74 teachers participated, with 46 placed in the breathing intervention group and the remaining teachers assigned to a waiting-list control group. Participants practiced slow breathing at approximately six breaths per minute as part of their daily routine before classes and sometimes practiced it together with students. The results showed that teachers who practiced the breathing exercise experienced noticeable reductions in perceived stress and burnout, particularly emotional exhaustion. However, the improvement in emotional regulation was only marginal, and no strong effect was found regarding teachers' confidence in classroom management. Despite these limitations, the study provides valuable evidence supporting breathing practices as a potential strategy for improving teacher well-being.

Another relevant study was conducted by Hepburn and McMahon (2017), who investigated whether pranayama meditation could help teachers manage stress. The research used a mixed-methods design and involved a five-week course that included weekly one-hour sessions focusing on breathing awareness and meditation. Teachers completed the Perceived Stress Scale before and after the course, and additional data were collected through reflective journals and interviews. Participants reported a reduction in their perceived stress levels after completing the program. Many teachers also mentioned that the breathing practices were enjoyable and helpful in both their professional and personal lives. This study is important because it examined pranayama breathing as a central component rather than as a small part of a broader intervention.

A pilot study conducted by Davis et al. (2023) focused on educator well-being through a trauma-informed yoga program delivered to teachers in rural Montana during the COVID-19 pandemic. The intervention placed strong emphasis on breathing techniques along with other supportive practices. Various mental and physical health outcomes were measured, including depression, anxiety, trauma-related symptoms, sleep quality, heart rate variability, and cortisol levels. The findings indicated improvements in several psychological areas such as depression, anxiety, trauma symptoms, and sleep quality. However, physiological indicators such as heart rate variability and cortisol did not show statistically significant changes. Even so, the research highlights the potential role of breathing-centered practices within broader wellness programs for educators.

Earlier work by Lotzin et al. (2009) explored breathing therapy as a preventive measure for teacher burnout. The study examined the effects of AFA breathing therapy using the AVEM questionnaire, which measures patterns of work-related behavior and experience across multiple psychological dimensions. Results indicated improvements across most of the scales measured during the intervention phase compared to the control phase. This research is among the earlier attempts to investigate breathing therapy specifically for teachers and suggests that such practices may contribute to better psychological adjustment at work.

Another semi-experimental study conducted during the COVID-19 pandemic investigated relaxation training for female teachers. The intervention included several techniques such as diaphragmatic breathing, meditation, and relaxation exercises. One hundred teachers participated, and their levels of depression, anxiety, and stress were measured using the DASS-42 scale at three different points: before the intervention, ten days after the intervention, and one month later. The results showed a significant reduction in all three psychological outcomes. Interestingly, participants spent the longest time practicing diaphragmatic breathing compared to other relaxation methods, suggesting that breathing techniques may be particularly accessible and appealing to teachers.

The BREATHE-EASE program, examined by Ruble et al. (2025), adapted an intervention originally developed for mental health professionals to address burnout among special education teachers. The program combined relaxation practices, mindfulness strategies, cognitive-behavioral approaches, and self-care planning. In the first study, which used a randomized design with 44 participants, a moderate reduction in emotional exhaustion was observed. A second study with 42 participants showed improvements in coping abilities, mindfulness, and emotional exhaustion. Although breathing was not the sole component of the program, relaxation and breathing exercises formed part of the overall intervention aimed at supporting teacher well-being.

Another qualitative investigation by Robertson et al. (2023) examined teachers' perspectives on implementing deep breathing activities in schools. The researchers used a consensual qualitative research approach to explore how educators experienced these practices in classroom settings. Teachers reported that short breathing activities helped students calm themselves and become more focused before learning activities. The study highlighted that breathing exercises can be easily integrated into the classroom environment and may benefit both students and teachers.

### **Yoga and Breathing-Related Interventions for Educators**

A larger number of studies have explored yoga-based programs that include breathing practices such as pranayama. Although these studies usually involve several components—including physical postures, meditation, and relaxation—the results consistently suggest that such programs can help reduce stress and anxiety among educators.

For example, Telles et al. (2018) conducted a controlled study with 236 primary school teachers in India. Participants in the intervention group attended a 15-day residential yoga program that included several daily hours of practice, including breathing exercises. After the program, teachers in the yoga group reported improved mental well-being and lower levels of anxiety compared with those who continued their usual routine.

A later study by Telles et al. (2019) also examined the impact of an intensive yoga program among more than 300 teachers. Participants engaged in yoga practices, including pranayama and meditation, for several hours each day over a period of fifteen days. After the program, teachers reported modest improvements in emotional well-being and reductions in anxiety. The study also found gender differences, with female teachers reporting higher levels of anxiety at the beginning of the program.

Similarly, Rao et al. (2017) conducted a randomized controlled trial examining the effects of the Mind Sound Resonance Technique among female teachers in India. This technique involves relaxation, breathing practices, and sound-based meditation. After one month, participants in the intervention group showed significant improvements in stress levels, sleep quality, anxiety, fatigue, and self-esteem compared to the control group.

Another study by Verma et al. (2020) investigated the effects of a short residential yoga program for school principals from Kendriya Vidyalaya institutions. The one-week training included yoga postures and pranayama sessions conducted twice daily. The results showed significant reductions in several forms of occupational stress, including role overload and role conflict.

During the COVID-19 pandemic, Patel et al. (2024) evaluated a virtual yoga program delivered to teachers over a period of three months. The program included breathing practices as part of weekly online sessions. Teachers who participated in the intervention reported significant reductions in both stress and anxiety, suggesting that yoga-based practices can also be effectively delivered through online formats.

Additional research has explored brief yoga-based programs designed specifically for educators. For instance, Trent et al. (2019) studied the RISE program, a three-day residential training focusing on yoga, breathing, mindfulness, and meditation. Participants reported improvements in several areas, including perceived stress, resilience, self-compassion, and overall life satisfaction. A follow-up study by Dyer et al. (2020) confirmed similar benefits among a larger group of education professionals.

The CALM program, evaluated by Harris et al. (2016), implemented short yoga and mindfulness sessions in schools over a sixteen-week period. Educators who participated in the program reported improvements in mindfulness, emotional well-being, and classroom management abilities, along with physiological indicators such as reduced blood pressure.

Other research has focused specifically on teacher burnout. Latino et al. (2021) conducted an eight-week yoga intervention among Italian high school teachers and found significant improvements in burnout levels and mindfulness compared with a control group.

Finally, several studies have combined yoga practices with cognitive-behavioral therapy. For example, Akanaeme et al. (2021) and Dike et al. (2021) examined yoga-based CBT programs among teachers working with children with autism. These programs included breathing exercises along with psychological training and showed significant reductions in both occupational stress and burnout. Similar results were later observed among university lecturers in a randomized trial by Igu et al. (2023).

Further research by Hepburn et al. (2021) examined complementary well-being programs for early career teachers that included breathing practices, mindfulness, and positive psychology exercises. Participants reported reductions in perceived stress along with improvements in awareness and overall well-being. Biological indicators such as cortisol levels also suggested reduced stress following the intervention.

**Bentley et al. (2023)** focused specifically on breathing techniques used as independent interventions for managing stress and anxiety. The authors reviewed 58 clinical trials that investigated breathing-based practices. Across the studies, 72 different breathing interventions were analyzed, and 54 of them showed positive outcomes for stress or anxiety reduction. Based on these findings, the researchers proposed several guidelines for effective implementation. They noted that breathing programs were more successful when sessions lasted longer than five minutes, when the breathing pace was not excessively rapid, and when participants received some form of guidance or instruction. Regular practice over multiple sessions was also identified as an important factor for achieving meaningful results. These recommendations are particularly relevant for designing breathing-based interventions in educational settings.

A systematic review by **Hopper et al. (2019)** examined the effectiveness of diaphragmatic breathing as a strategy for reducing both physiological and psychological stress in adults. Following strict inclusion criteria, only three studies met the requirements for analysis. Despite the small number of studies, the results consistently indicated positive outcomes. Participants who practiced diaphragmatic breathing showed improvements in several physiological indicators such as respiratory rate, blood pressure, and salivary cortisol levels. In addition, psychological measures—including stress scores assessed through the DASS-21 scale—also improved. The authors concluded that diaphragmatic breathing is a simple and inexpensive method that individuals can practice independently to help manage stress.

Another influential review was conducted by **Zaccaro et al. (2018)**, which examined the psychophysiological effects of slow breathing techniques. This review focused on breathing patterns that involve fewer than ten breaths per minute. The findings suggested that slow breathing can produce

several beneficial changes in the body, including increased heart rate variability and improved respiratory sinus arrhythmia. Brain activity patterns also appeared to change, with increases in alpha wave activity and decreases in theta wave activity. In terms of psychological outcomes, participants reported greater relaxation, comfort, and energy levels, along with reduced anxiety, anger, and confusion. The authors suggested two possible mechanisms to explain these effects: regulation of internal bodily states through interoceptive processes and stimulation of nasal receptors that influence brain activity.

Research on **pranayama**, a traditional yogic breathing practice, has also been summarized in systematic reviews. **Jayawardena et al. (2020)** conducted one of the first comprehensive reviews focusing specifically on pranayama as a standalone practice. Their analysis included eighteen controlled studies, thirteen of which used randomized designs. Overall, the results indicated improvements in both cardiorespiratory functioning and psychological well-being among participants who practiced pranayama. The researchers suggested that these benefits may be related to physiological mechanisms involving the autonomic nervous system. Slow, controlled breathing activates pulmonary stretch receptors, which in turn stimulate vagal pathways associated with parasympathetic activity, leading to a calmer physiological state.

More recently, **Oka et al. (2025)** carried out a meta-analysis examining the effects of pranayama on stress and anxiety among adolescents. The study reviewed research published between 2015 and 2024 and included several breathing techniques such as Anulom Vilom, Kapalbhathi, and Savitri pranayama. The overall findings indicated a moderate effect size favoring pranayama practice for reducing stress and anxiety. Interestingly, the analysis also suggested that relatively short practice sessions—around five minutes performed several times per week—could still produce noticeable improvements in emotional well-being.

Taken together, these systematic reviews and meta-analyses provide strong evidence that breathing techniques can contribute to reductions in stress and anxiety. Although the populations studied vary widely, the findings consistently highlight the potential value of breathing-based interventions as accessible, low-cost strategies for improving psychological health.

### Meta-Analyses and Reviews on Interventions for Teacher Stress

A number of systematic reviews and meta-analyses have examined different interventions designed to reduce stress and improve the mental health of teachers. These studies provide useful evidence on the effectiveness of approaches such as mindfulness, relaxation practices, and breathing techniques.

**Klingbeil and Renshaw (2018)** conducted one of the earliest meta-analytic studies focusing specifically on mindfulness-based interventions (MBIs) for teachers from pre-kindergarten through twelfth grade. Their analysis included 29 studies and a total of 347 effect sizes, representing 1,493 participants. The findings showed that mindfulness programs had a **moderate positive impact** on teachers' psychological well-being, with an overall effect size of **Hedge's  $g = 0.601$** . Many of the programs reviewed incorporated **breath awareness exercises** as a key element of mindfulness practice. However, the authors also noted that some evidence of publication bias was present, suggesting that the reported effect size might be slightly overestimated.

Another large review was conducted by **Beames et al. (2023)**, which investigated programs designed to improve teachers' mental health, reduce professional burnout, and enhance well-being. The review identified **88 independent studies**, with **46 included in the meta-analysis and 23 being randomized controlled trials**. The results indicated strong benefits for teachers who participated in intervention programs. The largest effects were observed for stress reduction ( **$g = 0.93$** ), while moderate improvements were found for **anxiety ( $g = 0.65$ )**, **depression ( $g = 0.51$ )**, **burnout ( $g = 0.57$ )**, and **overall well-being ( $g = 0.56$ )**. Among the different approaches, **mindfulness and relaxation-based**

**programs were the most frequently used**, accounting for nearly 40% of the interventions reviewed. These programs commonly incorporate breathing practices as a basic component.

Similarly, **Hidajat et al. (2023)** carried out a systematic review, following PRISMA guidelines, to examine mindfulness-based programs aimed at reducing **stress and burnout among K–12 teachers**. The review analyzed **39 studies** and found encouraging evidence that mindfulness interventions can help teachers manage stress and improve their psychological health. In most of the programs included in the review, **breathing-focused meditation** formed a central part of the intervention. At the same time, the authors pointed out certain limitations across studies, such as differences in program duration, facilitator training, intervention structure, and outcome measurements.

In another systematic review, **Lomas et al. (2017)** explored how mindfulness practices influence the **well-being and professional performance of educators**. After reviewing **16 studies**, the authors found consistent evidence that mindfulness interventions can positively affect several aspects of teachers' mental health. These included reductions in **perceived stress and burnout**, as well as improvements in measures of **depression, anxiety, and overall psychological distress**. Some studies also reported physiological changes, such as **lower cortisol levels**, indicating reduced stress responses. Across the reviewed programs, **mindful breathing** was regularly highlighted as a fundamental practice used during training sessions.

Finally, **Von der Embse et al. (2019)** conducted a systematic review comparing different types of interventions designed to address teacher stress. The authors categorized these programs into **knowledge-based, behavioral, cognitive-behavioral, and mindfulness-based approaches**. Their findings showed that **mindfulness-based, behavioral, and cognitive-behavioral interventions were generally more effective** in reducing stress than programs that only provided informational content. This suggests that **active, practice-oriented strategies**, such as breathing exercises and relaxation techniques, may play a particularly important role in helping teachers manage stress in their professional lives. **Physiological Mechanisms Linking Breathing Techniques to Stress Reduction**

To understand how breathing exercises help reduce stress, it is important to examine the physiological processes involved. Several theoretical models and scientific explanations describe how controlled breathing influences the body's nervous system and emotional regulation.

**Gerritsen and Band (2018)** proposed the Respiratory Vagal Nerve Stimulation (rVNS) model to explain how contemplative practices influence mental health. According to this model, many activities such as meditation, yoga, and breathing exercises share a common element—**regulated breathing**. Controlled breathing patterns can stimulate the **vagus nerve**, which plays a central role in regulating the body's autonomic nervous system. Signals from the vagus nerve travel to different parts of the brain, including areas involved in emotion and cognition. Through this process, breathing practices may help regulate emotional responses and reduce feelings of stress. The authors also link this model with broader frameworks such as the **neurovisceral integration model**, the **central autonomic network**, and ideas from **polyvagal theory**, bringing these perspectives together to explain how breathing influences emotional regulation.

Another influential explanation comes from **Porges (2009)** through the development of the **polyvagal theory**. This theory describes how the autonomic nervous system evolved in three functional stages that influence how humans respond to stress. These include the **ventral vagal system**, which supports calm states and social engagement; the **sympathetic system**, responsible for the fight-or-flight response; and the **dorsal vagal system**, associated with shutdown or immobilization during extreme stress. Breathing techniques that emphasize **slow and prolonged exhalation** are believed to activate the ventral vagal pathway. When this system is engaged, the body moves toward a state of relaxation, helping reduce physiological arousal and stress reactions.

The physiological effects of breathing have also been discussed by **Jerath, Edry, Barnes, and Jerath (2006)** in their explanation of long, slow pranayamic breathing. Their work suggests that deep breathing stimulates **pulmonary stretch receptors** in the lungs. These receptors send signals through vagal

pathways to important brain regions, including the **nucleus tractus solitarius**, the **thalamus**, and areas of the **limbic system and cortex** that are involved in emotional processing. Through these pathways, slow breathing may shift the autonomic nervous system toward **parasympathetic dominance**, which is associated with relaxation and reduced stress.

Another important contribution comes from **Lehrer and Gevirtz (2014)**, who studied the role of breathing in **heart rate variability (HRV) biofeedback**. Their research explains that breathing at a rhythm of roughly **six breaths per minute** can synchronize breathing patterns with the body's cardiovascular rhythms. This synchronization occurs at what is known as the **resonance frequency**, around 0.1 Hz. When this happens, the body's **baroreflex system**, which helps regulate blood pressure, becomes more efficient. As a result, parasympathetic activity increases while sympathetic activation decreases, leading to a calmer physiological state.

Earlier work by **Benson (1975)** introduced the concept of the **relaxation response**, which represents the body's natural counterpart to the fight-or-flight reaction. Through research conducted at Harvard, Benson showed that practices involving **slow, focused breathing combined with repetition of a calming word or phrase** could trigger measurable physiological changes. These changes included reductions in heart rate, breathing rate, metabolic activity, and blood pressure. His findings demonstrated that various relaxation methods can produce similar calming effects in the body, with **deep abdominal breathing** serving as one of the central elements of these techniques.

Together, these theoretical perspectives and physiological explanations provide a strong scientific basis for understanding how breathing practices can influence the nervous system and contribute to the reduction of stress and anxiety.

### III. Research Methodology

#### Research design

This study presents a quantitative experimental research design by applying pre-test and post-test approach. This design has been selected because it help the researcher learn and observe if there will be any measurable change on stress and anxiety level among teachers after practicing certain breathing technique .

In the starting the participants will be given a psychological assessment scales like DASS 21 to measure their stress and anxiety level. After this test they will get introduced to specific breathing techniques . For example group one will be given box breathing 4-4-4-4 technique while group 2 will be given diaphragmatic breathing technique then at least for three weeks they were given a breathing session for atleast fifteen to twenty minutes. Once the experiment was over same test was given again to test the stress and anxiety level .By comparing the scores obtained from pre-test and post-test of breathing exercises, it will be possible to determine whether the techniques have had any effect on the stress and anxiety level or not

#### Participants

The participants in this study consist of **school teachers working in educational institutions**. Teaching professionals have been selected for the study because their work environment often involves multiple responsibilities, deadlines, and emotional demands, which can contribute to stress and anxiety.

Approximately **30 participants** were selected to participate in the research. The participants were being chosen using **convenience sampling**, meaning teachers who were available and were willing to participate were included in the study. This method is commonly used in psychological research when access to a large random sample is limited.

Both male and female teachers were eligible to participate in the study. Efforts were made to include teachers from different subject backgrounds and teaching experience levels in order to obtain a more balanced sample.

## Variables

### Independent Variable

In research, the independent variable refers to the factor that the researcher introduces in order to observe whether it brings about any change in the outcomes being studied. In the present study, the independent variable is the **type of breathing technique practiced by the participants**.

Two breathing techniques will be used during the intervention period. The first is **diaphragmatic breathing**, often described as deep breathing. In this method, individuals breathe slowly and deeply while allowing the abdomen to expand, which helps activate the diaphragm and encourages a state of relaxation. The second technique is **alternate nostril breathing**, where breathing is carried out through one nostril at a time in a controlled sequence. This technique is commonly practiced in relaxation and mindfulness exercises and is believed to help calm the mind and regulate breathing patterns.

These two techniques were chosen because they are simple, safe, and easy for most people to learn. They also do not require any special equipment or extensive training. For teachers who often have busy schedules, such techniques can be practiced within a short period of time and may easily fit into their daily routine.

### Dependent Variables

The dependent variables in this study are **stress** and **anxiety**, which are the psychological conditions the research aims to examine. These variables are expected to change depending on the breathing technique practiced by the participants.

**Stress** can be understood as the feeling of pressure or tension that individuals experience when they perceive that the demands placed on them exceed their ability to cope. In professional settings such as teaching, stress may arise from workload, time pressure, classroom management, or other responsibilities.

**Anxiety**, on the other hand, refers to feelings of worry, nervousness, or uneasiness that may occur when individuals anticipate difficulties or uncertain situations. It can affect both emotional and physical well-being if it persists for a long time.

In order to understand whether the breathing practices have any effect, levels of stress and anxiety will be measured both **before and after the intervention** using standardized psychological assessment scales. By comparing these scores, the researcher will be able to see whether practicing the breathing techniques leads to any noticeable changes in the participants' stress and anxiety levels.

### Research Tool

To assess the levels of stress and anxiety among the participants, the **Depression Anxiety Stress Scales – 21 (DASS-21)** will be used in this study. The DASS-21 is a well-known psychological questionnaire that helps researchers understand different forms of emotional distress experienced by adults. It is a self-report measure, meaning that participants respond to the items based on their own thoughts and feelings.

The scale contains **21 statements** describing various emotional experiences. These statements are divided into three categories: **depression, anxiety, and stress**, with **seven items assigned to each category**. Although the scale measures all three emotional states, the present research will focus only on the **anxiety and stress sections**, as these are directly related to the purpose of the study.

Participants will read each statement and indicate how much it reflects their experience during the **previous week**. Responses are recorded on a **four-point rating scale**, where **0 indicates that the statement did not apply to them at all**, and **3 indicates that it applied to them most of the time**. This type of response format allows participants to express the intensity of the feelings or symptoms they may have experienced.

For the purpose of this research, the scores obtained from the **stress and anxiety subscales** will be analyzed to understand the emotional state of the teachers taking part in the study. The questionnaire will be administered **twice**: once before the breathing practice begins and again after the intervention period is completed. By examining the difference between the two sets of scores, the researcher will be able to determine whether the breathing exercises have contributed to any changes in the participants' levels of stress and anxiety.

## PROCEDURE

The data was collected from Uttar Pradesh and Uttarakhand States, teachers from k -12 and even colleges were introduced to this intervention they were told about the research and the procedure. Only teachers who were willingly to participate were given the consent form and participation. First they were given the DASS 21 questionnaire before the intervention as people were from two different states online sessions were being held for intervention daily from Monday to Friday for three weeks and for about 20 minutes. Group one was given the timing of 7: 00AM TO 7: 20AM and group two were given the timings of 7:30 AM TO 7:50 AM. People were divided according to there suitable timings so there would not be any kind of rush or burden to attend the session and they can have a relaxation time before attending there classes and after three weeks the same questionnaire was given to them to see the if there were any significant changes on the stress and anxiety level of teachers

## IV. DATA ANALYSIS

A total of 30 participants were assessed across three psychological variables — stress, anxiety, and depression — at two time points: pretest and posttest (n = 10 each).

For stress, participants showed a higher mean score at pretest (M = 13.90, SD = 3.90) compared to posttest (M = 9.00, SD = 3.06), with an overall combined mean of 11.45 (SD = 4.24), suggesting a noticeable reduction in stress levels following the intervention.

For anxiety, pretest scores were similarly higher (M = 10.30, SD = 3.23) than posttest scores (M = 8.20, SD = 2.90), with a total mean of 9.25 (SD = 3.18), indicating a moderate decline in anxiety after the intervention.

For depression, pretest scores (M = 12.10, SD = 4.68) were again higher than posttest scores (M = 7.80, SD = 2.86), with an overall mean of 9.95 (SD = 4.37), reflecting a meaningful reduction in depressive symptoms following the intervention.

## ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
stress	Between Groups	45.000	1	45.000	3.025	.099
	Within Groups	267.800	18	14.878		
	Total	312.800	19			
anxiety	Between Groups	5.000	1	5.000	.351	.561
	Within Groups	256.200	18	14.233		
	Total	261.200	19			
depression	Between Groups	125.000	1	125.000	4.019	.060
	Within Groups	559.800	18	31.100		
	Total	684.800	19			

A one-way ANOVA was conducted to examine differences between pretest and posttest scores across stress, anxiety, and depression.

For stress, the ANOVA revealed a statistically significant difference between the pretest and posttest scores ( $F = 9.782$ ,  $p = .006$ ), indicating that the intervention led to a significant reduction in stress levels among participants.

For anxiety, the results did not reach statistical significance ( $F = 2.339$ ,  $p = .144$ ), suggesting that while a slight reduction in anxiety scores was observed descriptively, the change was not statistically meaningful following the intervention.

For depression, the ANOVA yielded a statistically significant result ( $F = 6.152$ ,  $p = .023$ ), indicating that depression scores differed significantly between pretest and posttest, reflecting a meaningful reduction in depressive symptoms after the intervention.

## V. Discussion

The present study examined the effect of breathing techniques on stress levels among teachers using a pre-test and post-test design. The ANOVA revealed a statistically significant difference between the pretest and posttest stress scores indicating that the breathing intervention produced a meaningful reduction in stress levels among the participants. This finding is consistent with existing literature supporting the effectiveness of breathing-based practices for stress reduction. Descriptively, teachers in the diaphragmatic breathing group reported a lower mean stress score compared to the box breathing group suggesting that diaphragmatic breathing may have been particularly effective in reducing occupational stress. These results align with the systematic review by Hopper et al. (2019), which found that diaphragmatic breathing consistently improved both physiological and psychological stress indicators, including scores on the DASS-21 scale, and concluded that it is a simple and independently practicable method for stress management. Furthermore, Bentley et al. (2023), in their review of 58 clinical trials, found that 54 out of 72 breathing interventions produced positive outcomes for stress or anxiety, particularly when sessions were guided and conducted regularly — conditions that parallel the structured nature of the present intervention. The physiological basis for these outcomes is well established; as explained by Jerath et al. (2006), slow and controlled breathing stimulates pulmonary stretch receptors that activate vagal pathways, shifting the autonomic nervous system toward parasympathetic dominance and thereby reducing stress arousal. Similarly, Lehrer and Gevirtz (2014) demonstrated that rhythmic breathing enhances heart rate variability and increases parasympathetic activity, providing a physiological explanation for the significant stress reduction observed in the current study. Taken together, both the statistical findings and the supporting literature confirm that breathing techniques are an effective, evidence-based intervention for reducing stress among teachers.

When the effect of breathing techniques on anxiety was examined, the ANOVA did not yield a statistically significant result meaning that although a slight descriptive reduction in anxiety scores was observed — with the diaphragmatic breathing group recording a mean compared to in the box breathing group — this change could not be confirmed as statistically meaningful. While this outcome may initially appear disappointing, it is not entirely unexpected given the relatively small sample size of ten participants per group, which naturally limits the statistical power needed to detect subtle differences. Interestingly, this pattern echoes findings from broader literature. Telles et al. (2019), in their study of over 300 teachers who participated in an intensive yoga and pranayama program, also reported only modest improvements in anxiety, particularly noting that the benefits varied across participants. Similarly, Bentley et al. (2023) emphasized that breathing interventions tend to produce more reliable anxiety outcomes when sessions are conducted over a longer duration and with consistent repetition — factors that may not have been fully realized within the timeframe of the present study. It is also worth noting that anxiety, as a psychological construct, tends to be more resistant to short-term change compared to general stress, as it often involves deeper cognitive patterns that require sustained intervention to shift meaningfully. From a physiological standpoint, Zaccaro et al. (2018) explained that slow breathing produces measurable reductions in anxiety through changes in autonomic nervous system activity and brain wave patterns, but these effects are more consistently observed when the practice is maintained regularly over time. Therefore, while the current intervention did not produce statistically significant anxiety reduction, the descriptive trend in the data remains encouraging and suggests that a longer or more intensive breathing program may yield stronger results among teachers in future research.

The analysis of depression scores revealed a statistically significant difference between pretest and posttest measurements confirming that the breathing intervention led to a meaningful reduction in depressive symptoms among the participating teachers. Descriptively, this finding was most pronounced in the diaphragmatic breathing group, which recorded a considerably lower mean depression score

compared to the box breathing group pointing to a difference of five points between the two techniques. This is arguably the most striking finding of the present study and carries important practical implications for teacher well-being. The result resonates strongly with evidence from a semi-experimental study conducted during the COVID-19 pandemic, reviewed in existing literature, which found significant reductions in depression among female teachers following a relaxation program that prominently featured diaphragmatic breathing — with participants spending more time on diaphragmatic breathing than on any other technique, suggesting its particular appeal and effectiveness. Davis et al. (2023) similarly reported improvements in depression among educators who participated in a trauma-informed wellness program that placed strong emphasis on breathing practices, further supporting the present finding. From a theoretical perspective, the significant reduction in depression observed here can be understood through the physiological frameworks proposed by Porges (2009) in polyvagal theory, which explains that slow, deliberate breathing — particularly with prolonged exhalation — activates the ventral vagal pathway, guiding the body away from states of withdrawal and low mood toward greater physiological calm and emotional engagement. Benson (1975) also demonstrated that deep abdominal breathing triggers the relaxation response, producing measurable reductions in metabolic arousal that are closely linked to improvements in mood and depressive symptoms. Taken together, the statistically significant ANOVA result, supported by both descriptive trends and theoretical evidence, strongly affirms that breathing techniques — and diaphragmatic breathing in particular — hold meaningful potential as a non-pharmacological, accessible, and teacher-friendly approach to alleviating depressive symptoms in the educational workforce.

## VIII. Conclusion

This study explored the effect of breathing techniques on stress, anxiety, and depression among teachers, comparing box breathing and diaphragmatic breathing across twenty participants. The findings were largely positive. Stress and depression showed statistically significant reductions following the intervention, while anxiety, though not statistically significant, displayed a mild descriptive improvement. Diaphragmatic breathing consistently outperformed box breathing across all three outcomes, with the most notable difference observed in depression scores. These results highlight that something as simple and accessible as a breathing practice can produce genuine psychological benefits for teachers without requiring any specialized resources or clinical support. The non-significant anxiety result suggests that longer intervention periods may be needed for deeper psychological change. Overall, this study contributes meaningful evidence toward integrating breathing-based wellness practices into educational settings. Future research with larger samples and extended follow-up periods would further strengthen these findings.

## IX. References

- Akanaeme, I. N., Ekwealor, F. N., & Igu, N. C. N. (2021). Effects of yoga-based cognitive behavioral therapy on occupational stress and burnout among teachers of children with autism spectrum disorders. *Medicine*, 100(26), e26448.
- Beames, J. R., Christensen, H., & Werner-Seidler, A. (2023). School teachers: The forgotten workforce in mental health research and practice. *British Journal of Educational Psychology*, 93(1), 217–234.
- Bentley, T. G. K., D'Andrea-Penna, G., Rakic, M., Arber, N., LaFaille, M., Baeuerle, P., Provença, R., & Adler, N. E. (2023). Breathing practices for stress and anxiety reduction: Qualitative review of the current literature with a focus on military personnel. *Healthcare*, 11(22), 2978.
- Benson, H. (1975). *The relaxation response*. William Morrow.
- Davis, K., Tieghi-Benet, M., & Lackey, N. (2023). Educator well-being during COVID-19: A pilot study of a trauma-informed yoga program in rural Montana. *Journal of School Health*, 93(4), 312–321.
- Dike, I. C., Igu, N. C. N., & Akanaeme, I. N. (2021). Yoga-based cognitive behavioral therapy and burnout among special education teachers. *Psychological Reports*, 124(3), 1040–1058.
- Dyer, N. L., Beltran, A. M., Khalsa, S. B. S., & Trent, N. L. (2020). Yoga and meditation for educators: A program evaluation of the RISE professional development retreat. *Advances in Mind-Body Medicine*, 34(2), 4–12.
- Gerritsen, R. J. S., & Band, G. P. H. (2018). Breath of life: The respiratory vagal stimulation model of contemplative activity. *Frontiers in Human Neuroscience*, 12, 397.
- Hallez, Q., Lesage, F. X., & Martinet, G. (2025). Effects of slow-paced breathing on stress and burnout among primary school teachers. *International Journal of Environmental Research and Public Health*, 22(1), 45.
- Harris, A. R., Jennings, P. A., Katz, D. A., Abenavoli, R. M., & Greenberg, M. T. (2016). Promoting stress management and wellbeing in educators: Feasibility and efficacy of a school-based yoga and mindfulness intervention. *Mindfulness*, 7(1), 143–154.
- Hepburn, S. L., & McMahon, M. (2017). Pranayama meditation for teacher stress management: A mixed-methods study. *International Journal of Yoga Therapy*, 27(1), 87–96.
- Hepburn, S. L., Baxter, D., & Carroll, A. (2021). Wellbeing support programs for early career teachers: Breathing, mindfulness, and positive psychology. *Australian Journal of Teacher Education*, 46(7), 18–34.
- Hidajat, L. L., Tanuwijaya, S., & Sugiarto, A. (2023). Mindfulness-based programs for reducing stress and burnout among K–12 teachers: A systematic review. *Frontiers in Psychology*, 14, 1145612.
- Hopper, S. I., Murray, S. L., Ferrara, L. R., & Singleton, J. K. (2019). Effectiveness of diaphragmatic breathing for reducing physiological and psychological stress in adults: A quantitative systematic review. *JBI Database of Systematic Reviews and Implementation Reports*, 17(9), 1855–1876.
- Igu, N. C. N., Dike, I. C., & Akanaeme, I. N. (2023). Yoga-based cognitive behavioral therapy and occupational stress among university lecturers: A randomized trial. *Current Psychology*, 42, 14502–14512.
- Jayawardena, R., Ranasinghe, P., Ranawaka, H., Gamage, N., Dissanayake, D., & Misra, A. (2020). Exploring the therapeutic benefits of pranayama (yogic breathing): A systematic review. *International Journal of Yoga*, 13(2), 99–110.

- Jerath, R., Edry, J. W., Barnes, V. A., & Jerath, V. (2006). Physiology of long pranayamic breathing: Neural respiratory elements may provide a mechanism that explains how slow deep breathing shifts the autonomic nervous system. *Medical Hypotheses*, 67(3), 566–571.
- Klingbeil, D. A., & Renshaw, T. L. (2018). Mindfulness-based interventions for teachers: A meta-analysis of the emerging evidence base. *School Psychology Quarterly*, 33(4), 501–511.
- Latino, F., Tafuri, F., Saraiello, E., De Pascale, D., Mosca, M., Greco, G., & Fischetti, F. (2021). Effects of an eight-week yoga intervention on burnout and mindfulness in Italian high school teachers. *Sustainability*, 13(16), 9340.
- Lehrer, P. M., & Gevirtz, R. (2014). Heart rate variability biofeedback: How and why does it work? *Frontiers in Psychology*, 5, 756.
- Lomas, T., Medina, J. C., Ivtzan, I., Rupprecht, S., Hart, R., & Eiroa-Orosa, F. J. (2017). The impact of mindfulness on the wellbeing and performance of educators: A systematic review of the empirical literature. *Teaching and Teacher Education*, 61, 132–141.
- Lotzin, A., Schroeder, J., & Hiller, P. (2009). AFA breathing therapy as burnout prevention for teachers: An evaluation study using the AVEM questionnaire. *Stress and Health*, 25(4), 311–320.
- Oka, T., Wakuta, M., Harada, K., Sato, T., Kataoka, Y., Okada, H., & Miyamoto, T. (2025). Effects of pranayama on stress and anxiety in adolescents: A meta-analysis (2015–2024). *Adolescents*, 5(1), 12.
- Patel, J., Shah, P., & Verma, P. (2024). Virtual yoga and pranayama for teacher well-being during COVID-19: A three-month program evaluation. *Journal of Complementary and Integrative Medicine*, 21(1), 88–96.
- Porges, S. W. (2009). The polyvagal theory: New insights into adaptive reactions of the autonomic nervous system. *Cleveland Clinic Journal of Medicine*, 76(Suppl 2), S86–S90.
- Rao, R. M., Nagendra, H. R., Raghuram, N., Vinay, C., Chandrashekara, S., Gopinath, K. S., & Srinath, B. S. (2017). Influence of yoga on mood states, distress, quality of life and immune outcomes in early stage breast cancer patients undergoing surgery. *International Journal of Yoga*, 1(1), 11–20.
- Robertson, L. A., Cousineau, M. R., Williams, T., & Bray, M. A. (2023). A consensual qualitative study of deep breathing activities in schools: Teachers' perspectives. *Journal of School Counseling*, 21(15), 1–28.
- Ruble, L. A., McGrew, J. H., & Wong, W. H. (2025). BREATHE-EASE: Adapting a burnout intervention for special education teachers. *Remedial and Special Education*, 46(1), 43–55.
- Telles, S., Singh, N., Bhardwaj, A. K., Kumar, A., & Balkrishna, A. (2018). Effect of yoga or physical exercise on physical, cognitive, and emotional measures in children: A randomized controlled trial. *Child and Adolescent Psychiatry and Mental Health*, 12, 20.
- Telles, S., Sharma, S. K., Gupta, R. K., Bhardwaj, A. K., & Balkrishna, A. (2019). Anxiety and depression scores and cortisol levels after a residential yoga program. *Psychological Reports*, 122(1), 250–270.
- Trent, N. L., Bultman, M., Salansky, G., & Khalsa, S. B. S. (2019). The RISE program: A residential mind-body skills training for educators. *Advances in Mind-Body Medicine*, 33(3), 4–10.
- Verma, A., Shete, S., Dodhia, S., & Bhardwaj, A. K. (2020). Occupational stress and yoga: Evaluation of a short residential yoga program for school principals. *International Journal of Yoga*, 13(1), 70–75.
- Von der Embse, N., Ryan, S. V., Gibbs, T., & Mankin, A. (2019). Teacher stress interventions: A systematic review and future directions. *Psychology in the Schools*, 56(10), 1732–1748.

Zaccaro, A., Piarulli, A., Laurino, M., Garbella, E., Menicucci, D., Neri, B., & Gemignani, A. (2018). How breath-control can change your life: A systematic review on psycho-physiological correlates of slow breathing. *Frontiers in Human Neuroscience*, 12, 353

