

uniwell

Physical and Mental Awareness for University Students



Co-funded by
the European Union



Editors

Tan Temel, YTU, Türkiye
Tuba Ugras, YTU, Türkiye
Yıldız Erdoğanoğlu, ABU, Türkiye
Paula Lebre, U Lisbon, Portugal
Dominique Persona Adorno, UNIPA, Italy

Authors

Sernaz Demirel, YTU, Türkiye
Yıldız Erdoğanoğlu, ABU, Türkiye
Sinem Asena Sel, ABU, Türkiye
Paula Lebre, U Lisbon, Portugal
Elisabete Monteiro, U Lisbon, Portugal
Tuba Ugras, YTU, Türkiye

Graphic Design

Ezgican Akgün, Eu&Pro, Czechia
Cevat Ucuncuoglu, Eu&Pro, Czechia

This work is created under the Erasmus+ Project 2023-2-TR01-KA220-HED-000171079, UniWell: Physical and Mental Awareness for University Students.

Publisher:

ISBN:

2024-2026

“The European Commission’s support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.”

Project Coordinator

Yıldız Technical University, YTU
Türkiye



Project Partners

Antalya Bilim University, ABU
Türkiye



University of Lisbon, U Lisbon
Portugal



University of Palermo, UNIPA
Italy



Coachmotion
Türkiye



Eu&Pro
Czechia



Technovias
Estonia





Physical and Mental Awareness for University Students

The project aims to enhance the mental wellness of university students by fostering cross-border collaboration and promoting holistic educational methodologies. Recognizing the unique stressors faced by today's students, we're committed to crafting resources that address emotional, psychological, and social well-being. By integrating traditional and digital tools, we seek to provide supportive environments, resources, and practices, empowering students to thrive academically and personally.

We anticipate the project to yield a comprehensive app packed with resources on mental wellness tailored for university students. The interactive content, from videos to e-books and podcasts, will foster improved mental health awareness and practices. As a result, students will gain enhanced coping strategies, resilience, and emotional intelligence.

Preface

Welcome to the UniWell E-Book, a resource developed within the framework of the Erasmus+ KA220-HED project UNIWELL: Physical and Mental Awareness for University Students, designed to support university students in navigating the challenges of academic life in the digital age. Higher education today offers incredible opportunities for learning, growth, and connection, yet it also presents new forms of stress and pressure. The increasing digitization of education and social life has transformed how we study, communicate, and develop our personal and social identities. While these changes create exciting possibilities, they also bring specific challenges: cognitive overload, digital fatigue, sedentary routines, social comparison, and the blurring of boundaries between academic responsibilities and personal life.

The UniWell E-Book has been created with these challenges in mind. Its purpose is not only to inform but also to provide practical, evidence-based tools and strategies that can help you maintain your physical, emotional, and mental well-being. Each chapter has been carefully designed to guide you through actionable steps, reflection prompts, and exercises that you can immediately apply to your daily life. The resource takes a holistic approach, combining textual explanations, visual summaries, infographics multimedia content, and self-reflective activities, ensuring that students,

with diverse learning preferences can engage meaningfully with the material.

The UniWell E-Book is organized to provide both structured learning pathways and flexible consultation options. You can read it sequentially or focus on specific modules according to your needs. Its main goals include:

1. Supporting Physical and Mental Well-Being
2. The chapters provide actionable insights to strengthen resilience, regulate emotions, and maintain healthy routines. Students will find guidance on managing stress, balancing screen time, fostering mindful technology use, and integrating physical activity into their daily lives.
3. Providing Coping Strategies for the Digital Age
4. Each chapter combines theory with practice, offering practical roadmaps for stress management, relaxation techniques, and strategies to prevent burnout. Whether you are looking for quick exercises to reset during a busy study day or more in-depth approaches to understanding your personal well-being, the e-book provides resources for all levels.
5. Serving as a Resource for Universities and Support Services
6. Beyond personal use, the e-book has been designed as a ready-to-use educational tool for university staff. Modules can be integrated into curricular activities, student support services, counseling programs, or digital self-help platforms, ensuring that its impact extends across institutional strategies for student well-being.

How This E-Book Can Support You

A Holistic and Engaging Learning Experience

The E-book's multimodal approach combines clear textual explanations with infographics, visual syntheses, multimedia content, and reflective exercises. This design ensures that students of different learning styles can interact with the material in a meaningful way. Importantly, the E-Book encourages active participation and self-reflection, helping students translate knowledge into actionable daily practices.

Advanced chapters (Chapters 10-12) are included for those who wish to deepen their understanding beyond foundational strategies. These sections offer more detailed scientific explanations and embodied approaches, providing enrichment for students and institutions that integrate the e-book into elective or extended modules. At the same time, the core content remains accessible and immediately applicable, ensuring that all students can benefit regardless of their prior experience with stress-management or wellness strategies.

A distinguishing feature of this E-Book is the rigorous expert evaluation that underpins its content. A dedicated Expert Review Board, composed of highly qualified academics and practitioners, has assessed the quality, relevance, and scientific grounding of all materials. Through their detailed qualitative feedback, iterative reviews, and guidance, the E-Book has been refined to ensure that it is both scientifically robust and pedagogically accessible. The result is a resource that is not only scientifically grounded but also engaging, actionable, and adaptable to diverse student needs. By bridging research and practice, the UniWell E-Book supports students in developing sustainable habits for well-being, resilience, and success in an increasingly digital academic environment. Students can be confident that the strategies and practices presented are research-informed, effective, and relevant to contemporary academic life.

Expertise Review Board

Name	Expertise	Country
Dr. Sonia Sicilia	<i>Student Support and Inclusion Expert, Functional Psychologist</i>	Italy
Dr. Calin Rus	<i>PhD in Social Psychology and Senior Expert for the Council of Europe at the Intercultural Institute of Timișoara</i>	Romania
Dr. Maria Kyriakidou	<i>Chair of the Division of Humanities and Social Sciences at ACT, American College of Thessaloniki</i>	Greece
Prof. Dr. Dominique Persano Adorno	<i>Associate Professor of Applied Physics at the University of Palermo and expert in Educational Innovation, Student-Centred Learning, and Higher Education Transformation</i>	Italy

Closing Remarks

We hope that you will use this E-Book as a trusted companion on your university journey—a guide to understanding and managing the unique challenges of contemporary student life. By exploring its chapters, engaging with its exercises, and reflecting on your own experiences, you will gain tools and strategies that can positively impact your health, learning, and personal growth. The UniWell Comprehensive E-Book represents a unique synthesis of scientific rigor, pedagogical innovation, and practical applicability, and it stands as a testament to what collaborative European projects can achieve in supporting student well-being. Welcome, explore, and take the first steps toward a more balanced, resilient, and empowered university experience.

The Editors

Chapters

1- Cultivating Body-Mind Awareness: A Path to Well-being	19
2- Breathing Exercises for Body-Mind Awareness	34
3- Sensory Awareness	60
4- Posture and Postural Control	81
5- Muscle Tension and Relaxation	104
6- Body-Mind Connection: Grounding, Mindfulness, Gentle Movement and Visualization for Well-being	120
7- Mindfulness and Somatics for Emotional Regulation and Stress Management	140
8- Movement Exploration and Self-Expression From Motion to Meaning, Exploring Identity Through Movement	157
9- Creative Movement and Improvisation for Well-being	177
10- Authentic Movement within Body, Space, Time and Energy Awareness	196
11- Quality of Movement and Creative Expression	213
12- Authentic Movement within Body and Social Awareness	227
13- Technology-Supported Wellness Plan	238

CHAPTER 2

Breathing Exercises for Body-Mind Awareness

Yıldız Erdoğanoğlu, Sinem Asena Sel



Abstract

This chapter explores how conscious breathing forges a powerful body-mind link. We begin by mapping the mechanics of respiration (diaphragm, ribs, and postural muscles) then show how targeted breath work influences physical comfort, emotional steadiness, and mental clarity. Readers learn how diaphragmatic, chest, box, and 4-7-8 patterns loosen neck-and-back tension from long study sessions, steady racing heartbeats under stress, and refresh focus during afternoon energy slumps. Use each technique at the right moment: perform a full reset after prolonged static positions; practice a slow-exhale wind-down to shorten the time it takes to fall asleep; and take brief micro-breaks while standing to continually refine your posture. This chapter presents vagus-nerve activation, cortisol reduction, and improved oxygen delivery into plain language. Blending evidence and hands-on practice, this chapter equips anyone seeking better posture, calmer nerves, sharper thinking, and deeper rest to weave simple, effective breathing techniques into daily life and craft a healthier, more balanced routine.

Focused Problems

- Neck, shoulder & lower-back tension
- Stiffness / fatigue from prolonged sitting
- Leg & foot fatigue from prolonged standing
- Stress / anxiety / pre-exam nerves
- Focus loss & mental fog
- Afternoon energy dip
- Difficulty falling asleep
- Elevated heart rate / palpitations
- Restlessness linked to blood-sugar swings

1. Introduction

Breathing is a natural action we perform countless times each day, often without even realizing it. However, this seemingly simple life function creates a powerful and effective bridge between our body and mind. When we learn to breathe correctly and mindfully, we not only achieve physical relaxation but also experience mental clarity, inner balance, and an overall sense of well-being.

In this section, we will begin by learning the basic structure and function of the respiratory system, its connection with the nervous system, and how breathing is controlled. Then, we will explore the effects of breathing exercises on body-mind awareness. You will be provided with information to help you understand which breathing techniques serve what purpose, how they are practiced, and the physiological and psychological mechanisms behind them.

“When we learn to breathe correctly and mindfully, we not only achieve physical relaxation but also experience mental clarity, inner balance, and an overall sense of well-being.”

Additionally, we will show you how to easily integrate these breathing techniques into your daily life and how regular practice can bring noticeable improvements in your quality of life. With explanations supported by visuals, you will have a guide that enables you to practice the techniques on your own.

2. The Primary Function and Anatomy of the Respiratory System

The primary function of the respiratory system is to supply oxygen to the blood and to remove waste gases, mainly “carbon dioxide,” from the body. This process takes place through breathing: we inhale oxygen and exhale carbon dioxide. Breathing occurs as a result of the diaphragm contracting and relaxing, drawing air in through the mouth or nose [1].

As we inhale, air enters through the nasal cavity into the pharynx, then passes through the larynx and reaches the trachea. From the trachea, it moves through the bronchial tree and its branches, eventually reaching the alveoli. Gas exchange between oxygen and the blood takes place in the alveoli through the surrounding capillaries (Figure 2.1).

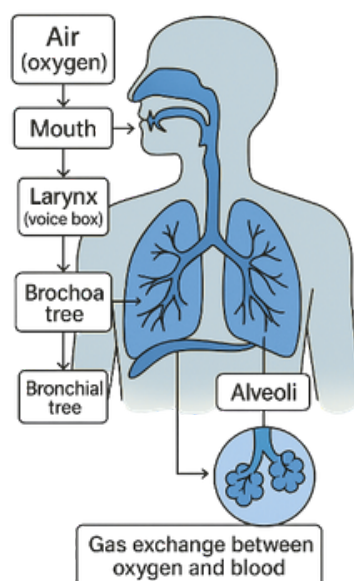


Figure 2.1. Organs of the Respiratory System and Their Functions (AI-generated image)

Ventilation is an active process that requires energy, as it involves muscle contraction. The primary muscles involved in respiration are the diaphragm and the external intercostal muscles. The diaphragm is a dome-shaped muscle with its upper surface curving outward. When the diaphragm contracts, it flattens, expanding the thoracic cavity.

During inspiration (inhalation), the external intercostal muscles lift the ribs and the sternum upward, expanding the chest cavity in the horizontal plane. Simultaneously, the diaphragm moves downward, increasing the volume of the thoracic cavity in the vertical plane. This increase in chest cavity volume lowers the pressure in the lungs (and alveoli) below atmospheric pressure, causing air to flow into the lungs.

During expiration (exhalation), the external intercostal muscles and diaphragm relax, allowing the thoracic cavity to return to its pre-inhalation volume [2] (Figure 2.2).

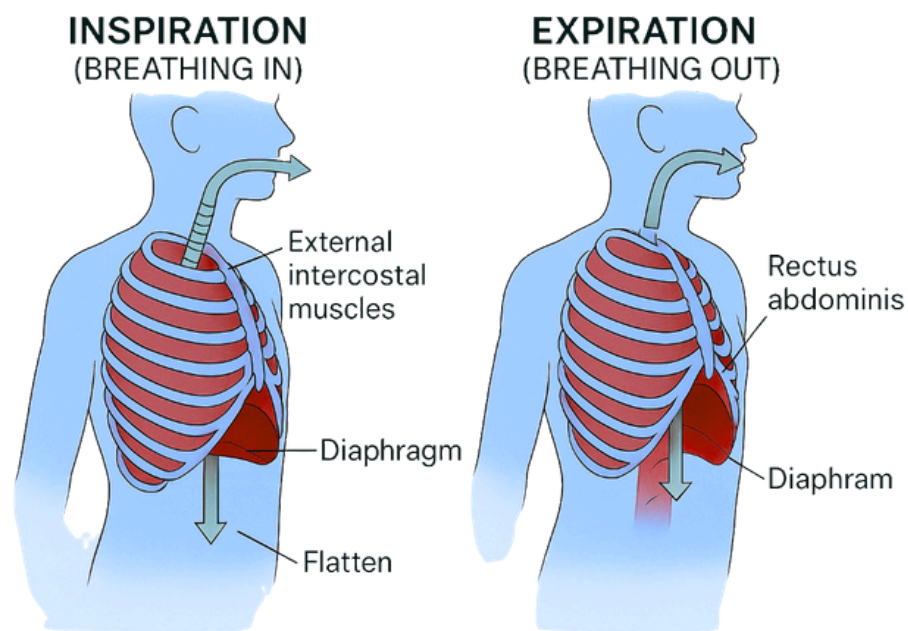


Figure 2.2. Main Muscles Involved in Inhalation and Exhalation
(AI-generated image)

Breathing is generally an unconscious activity but the rate and depth of breathing can be voluntarily controlled and even temporarily stopped—for example, while swimming underwater. However, voluntary control over breathing is limited; the respiratory centers are always ready to take over when necessary. Breathing can also be influenced by a person's mental state and emotions. Anticipation of fear, anxiety, or a stressful situation can cause involuntary increases in both the rate and depth of breathing.

Beyond its role in gas exchange, respiration also plays a key role in regulating the body's pH balance, electrolyte levels, blood flow, hemoglobin chemistry, and kidney function. Moreover, it significantly affects behaviors such as motivation, strength, mood, focus, perception, and memory (3).

Deep breathing increases the amount of blood returning to the heart [7]. This helps the heartbeat more strongly and pump more blood. Heart rate and blood pressure rhythms synchronize with the breathing cycle. This harmony supports more efficient blood flow through the vessels.

Regular breathing can help lower blood pressure [8]. Slow and rhythmic breathing, especially around 6 breaths per minute and helps synchronize breathing with the heartbeat. This supports more efficient functioning of both the respiratory and cardiovascular systems [9]. The exchange of oxygen and carbon dioxide in the lungs becomes more efficient. The heart's workload is reduced, and blood pressure becomes more balanced [10]. Deep breathing activates the vagus nerve, which in turn stimulates the parasympathetic nervous system, the part of the nervous system responsible for calming the body [11].

As a result, stress is reduced, the heart rate slows down, and a sense of relaxation is achieved. At the same time, the body becomes better able to adapt to changing conditions, such as standing up or exercising. Through breath, the nervous system is balanced, allowing for both relaxation and increased energy when needed (Figure 2.3).

“Deep breathing activates the vagus nerve, which in turn stimulates the parasympathetic nervous system, the part of the nervous system responsible for calming the body.”

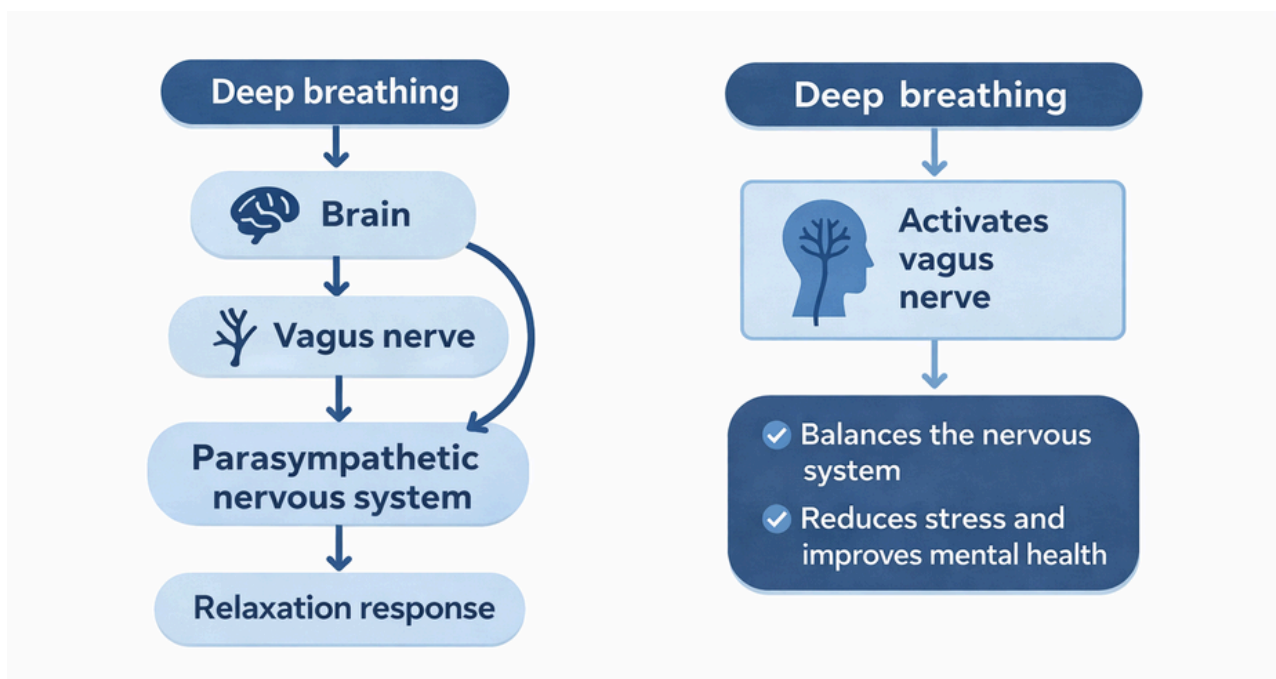


Figure 2.3. Deep Breathing and the Nervous System (AI-generated image)

Proper breathing techniques have been found to have positive effects on mental health. They have been shown to reduce levels of stress, anxiety, and depression, and to strengthen overall mental well-being [12]. There is scientific evidence showing that breathing techniques used during mindfulness-based practices combined with breathing exercises can reduce individuals' levels of stress hormones and enhance body awareness [13].

3. Breathing Techniques

The primary goal of breathing technique practices is known to be mental relaxation, stress management, and physical relaxation. Breathing exercises are a form of moderate-intensity activity used to slow down the breathing rate and extend the duration of each breath. Research has shown that breathing exercises help reduce the level of oxidative stress in the body [14]. Controlled breathing is believed to have a significant effect on the parasympathetic nervous system. In particular, extending the duration of exhalation is thought to reduce the release of stress hormones, decrease amygdala activation, and alleviate both the physiological and psychological symptoms of stress [15].

In this section, you will find information on how to perform basic breathing exercise techniques and how to integrate them into your daily life. These techniques are not limited to short sessions in quiet environments; they are also practical tools you can use throughout the day while walking, reflecting deeply, or managing stress before an exam.

Incorporating such practical methods into the daily routine is especially important for university students as they cope with academic, social, and emotional pressures. Breathing techniques not only enhance mental performance but also improve sleep quality, extend attention span, and support emotional regulation.

In addition, combining the physical and mental awareness exercises featured in different sections of this chapter with breathing techniques will promote a holistic sense of well-being for both body and mind. Using proper breathing during exercise enhances movement efficiency, optimizes oxygen flow to the muscles, and accelerates post-exercise recovery.

Therefore, whether you are doing a brief stretch at your desk or taking a walk across campus, every movement supported by proper breathing techniques will contribute to your overall health.

Now, we will introduce you to some basic breathing exercises that you can easily incorporate into your daily life.

3.1. Key Breathing Techniques

Diaphragmatic Breathing

Diaphragmatic breathing is defined by the upward and downward movement of the diaphragm muscle, which is located just below the lungs. This breathing technique allows the lungs to expand approximately 1.5 times more than during normal breathing, enabling them to fill with more air [16,17]. Perform diaphragmatic breathing in ten sets three times a day, pausing for a few natural breaths after every three diaphragmatic breaths.

Now, let's practice diaphragmatic breathing (DB) step by step together:



Figure 2.4. Preparation for Diaphragmatic Breathing (AI-generated image)

STEP 1 – Preparation

Lie on your back. Place one hand on your chest and the other on your abdomen. Relax your body and focus on your breath (Figure 2.4).



Figure 2.5. Inspiration of Diaphragmatic Breathing

STEP 2 – Inspiration

Take a slow, deep breath in through your nose. Your diaphragm contracts, causing your abdomen to expand upward. Chest movement should be minimal (Figure 2.5).

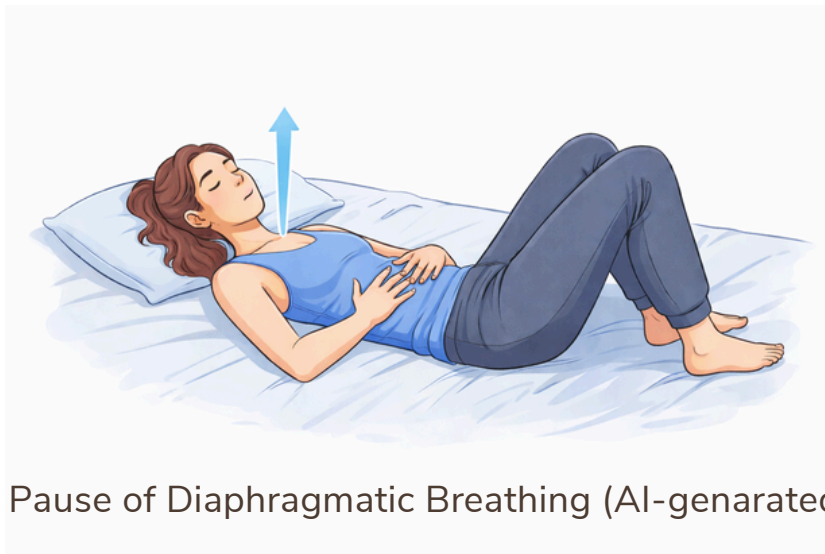


Figure 2.6. Pause of Diaphragmatic Breathing (AI-generated image)

STEP 3 – Pause

After inhaling, pause briefly for 1–2 seconds. During this time, your abdomen should remain expanded, and your chest should stay still. Be aware of your breath (Figure 2.6).

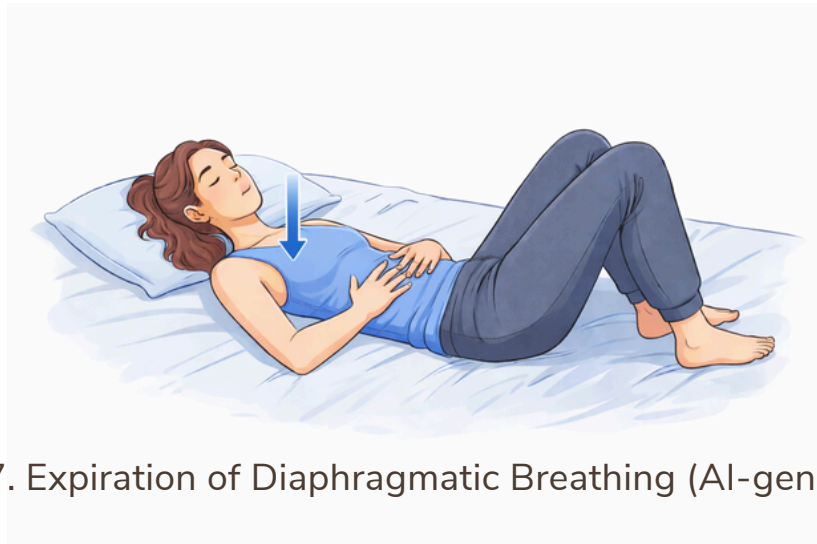


Figure 2.7. Expiration of Diaphragmatic Breathing (AI-generated image)

STEP 4 – Expiration

Slowly breathe out through your nose or mouth. Your diaphragm relaxes and your abdomen pulls inward. Exhale completely and calmly (Figure 2.7).



Video 2.1. Diaphragmatic Breathing (AI-generated image)

Chest Breathing Technique

Chest breathing technique is a method of respiration in which air enters the lungs primarily through the expansion of the upper lobes of the lungs and the rib cage. In this technique, the intercostal muscles (muscles between the ribs) become active, and breathing occurs as the rib cage rises upward (18, 19). For optimal benefit, perform chest breathing in ten-breath cycles, three times daily, pausing for several relaxed, natural breaths after every third chest inhalation and exhalation.

Now, let's practice Chest Breathing step by step together:



Figure 2.8. Posture of Chest Breathing (AI-generated image)

STEP 1- Posture: Adopting a Comfortable and Upright Position

Sit or stand with your back straight. Relax your shoulders and avoid leaning too far forward or backward (Figure 2.8).



Figure 2.9. Inspiration of Chest Breathing (AI-generated image)

STEP 2 - Inspiration: Slow Nasal Breathing with Chest Expansion

Take a slow, shallow breath through your nose. As you do, feel your chest rise and expand upward (Figure 2.9).

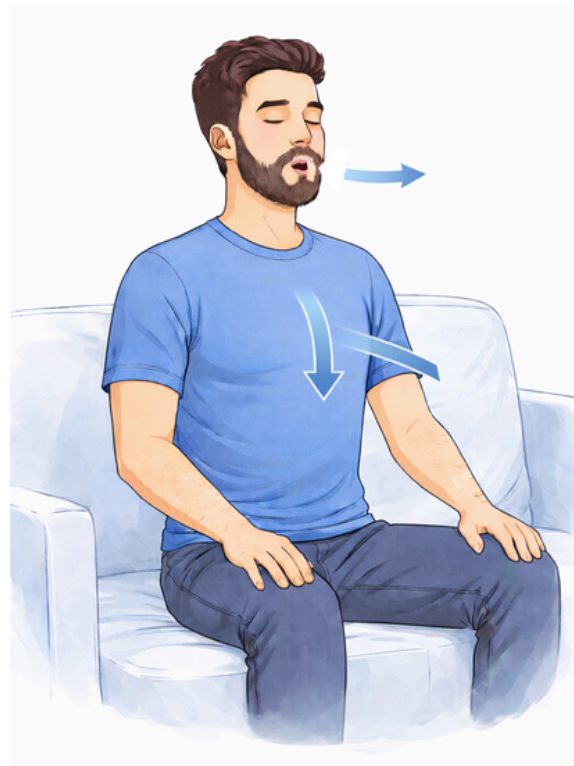
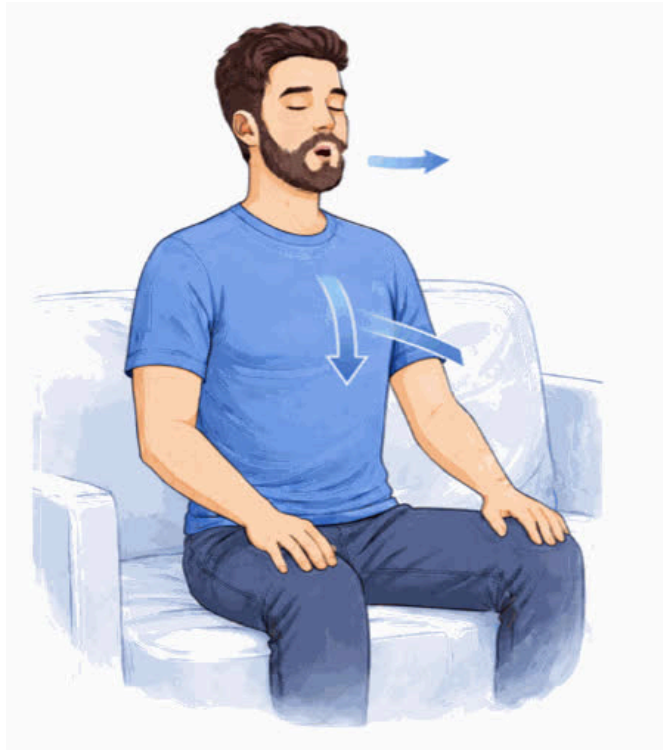


Figure 2.10. Expiration of Chest Breathing (AI-generated image)

STEP 3- Expiration: Controlled Breathing Out Through the Mouth

Gently open your mouth and slowly exhale. As you breathe out, focus on your chest gradually returning to its original position, lowering and narrowing (Figure 2.10).



FVideo 2.2. Chest Breathing Technique (AI-generated image)

Box Breathing Technique

It is a technique that involves a slow breathing rhythm and is widely used especially by athletes and professionals. Also known as “four square breathing,” it consists of a simple four-step process: inhale for 4 seconds, hold the breath for 4 seconds, exhale for 4 seconds, and wait for 4 seconds before the next breath (Figure 2.11). Repeat this cycle three to ten times, and practice box breathing three times daily (20).

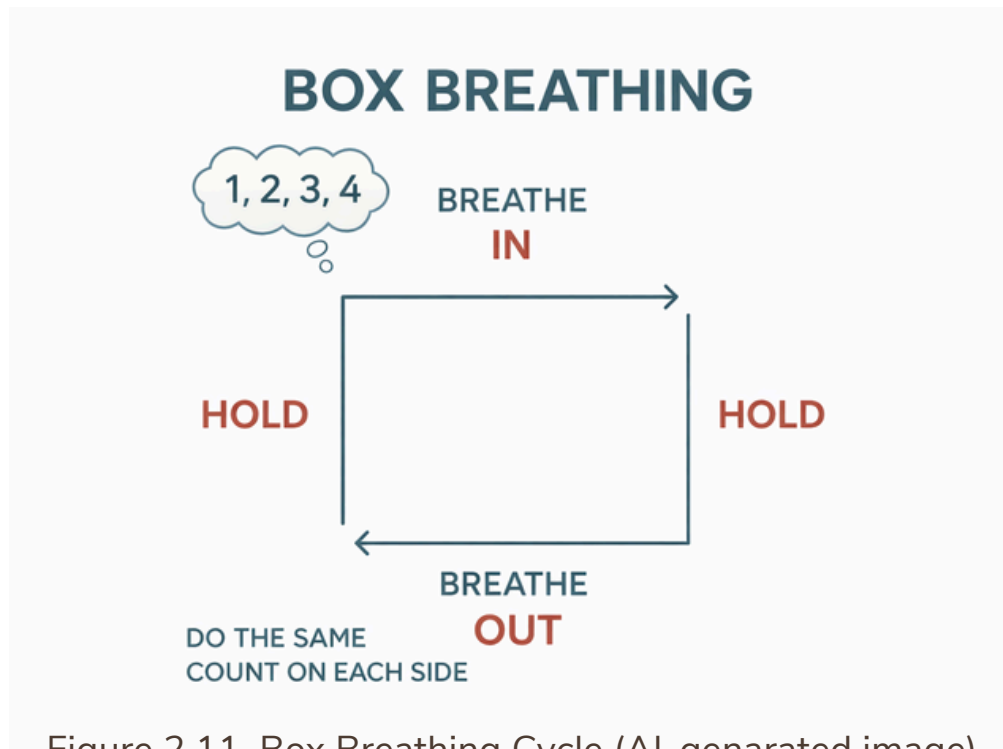


Figure 2.11. Box Breathing Cycle (AI-generated image)

Now, let's practice the Box Breathing technique step by step together.



Figure 2.12. Inspiration for Box Breathing (AI-generated image)

STEP 1 –Inspiration

Slowly and deeply inhale through your nose for 4 seconds. Focus on the expansion of your chest and abdomen (Figure 2.12).



Figure 2.13. Breath Hold of Box Breathing (AI-generated image)

Step 2 – Breath Hold (Post-Inhalation Pause)

Hold the breath you've taken in and remain still for 4 seconds. Try to keep your body relaxed and calm during this pause (Figure 2.13).



Figure 2.14. Expiration of Box Breathing (AI-generated image)

STEP 3 – Expiration

Slowly exhale through your mouth or nose for 4 seconds. Feel your chest and abdomen gradually contracting (Figure 2.14).



Figure 2.15. Breath Hold of Box Breathing (AI-generated image)

STEP 4 – Breath Hold (Post-Exhalation Pause)

After exhaling, wait for 4 seconds before taking your next breath. Notice the sense of calm in your body during this pause (Figure 2.15).



Video 2.3. Box Breathing Technique (AI-generated image)

4-7-8 Breathing Technique

The 4-7-8 breathing technique is one of the controlled breathing methods and is especially used for relaxation, stress reduction, and improving sleep quality. This technique is based on regulating the durations of inhalation, breath-holding, and exhalation according to a specific rhythm (21).

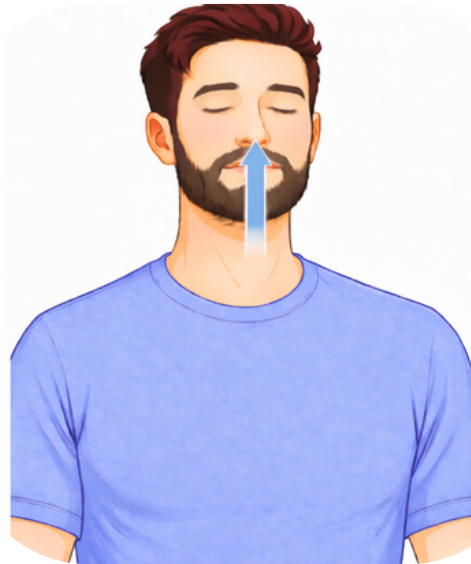


Figure 2.16. Inspiration of 4-7-8 Breathing Technique (AI-generated image)

STEP 1 - Inspiration

Take a breath in through your nose for 4 seconds (Figure 2.16).



Figure 2.17. Breath Hold of 4-7-8 Breathing Technique (AI-generated image)

STEP 2 - Breath hold

Hold your breath for 7 seconds (Figure 2.17)

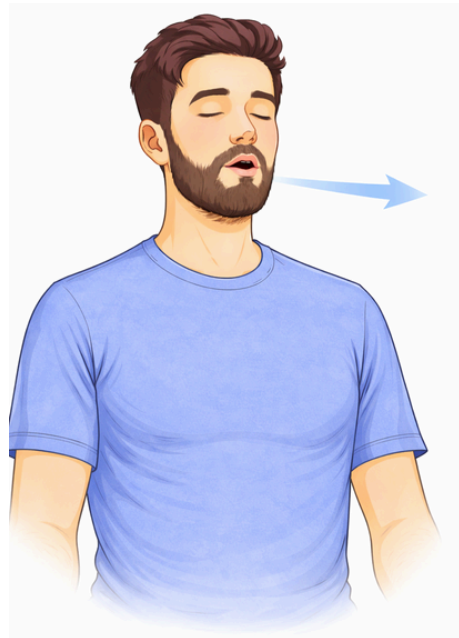
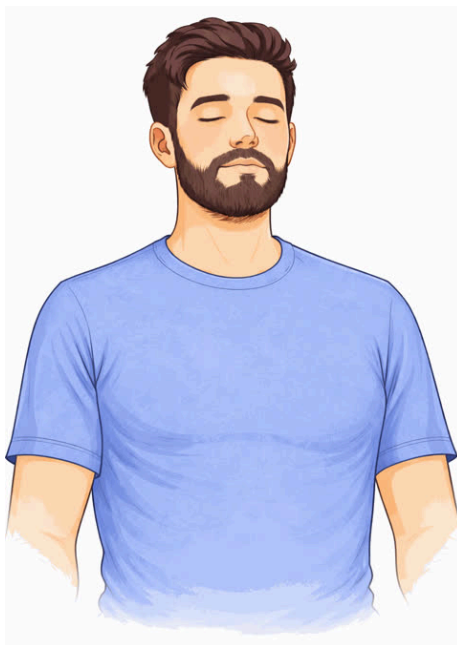


Figure 2.18. Expiration of 4-7-8 Breathing Technique (AI-generated image)

STEP 3- Expiration

Slowly exhale through your mouth for 8 seconds (Figure 2.18).



Video 2.4. 4-7-8 Breathing Technique (AI-generated image)

How to Integrate into Daily Life?

- You can do any breathing exercises as part of your morning routine. Starting the day with breathing practice can help reduce your stress levels.
- You can take short breaks while studying to do breathing exercises. This will help improve your concentration.
- Focusing on your breath during physical exercise reduces stress levels and lowers heart rate.
- Using breathing techniques when you feel stressed before an exam can help regulate your stress levels.
- Practicing breathing exercises before bedtime can help you fall asleep more easily.
- Practising these techniques regularly reduces tension in your neck, shoulders, and back, and helps modulate pain.
- Opening your chest and drawing the shoulders back while you breathe helps correct slumped posture.
- Include brief breathing pauses throughout the day (on the metro, in lifts, or while files render) to stay calm and alert (23, 24).

Conclusion

Breathing is a vital action that takes place in every moment of our daily lives. Proper breathing not only supports stress management, body awareness, and mental clarity in everyday situations, but also has significant physiological effects, such as stimulating the parasympathetic nervous system, lowering blood pressure, and maintaining the oxygen-carbon dioxide balance in the lungs. In this context, by incorporating breathing techniques into our daily routines, we can regulate our stress levels, support our mental health, and enhance our body awareness.

By incorporating breathing techniques into our daily routines, we can regulate our stress levels, support our mental health, and enhance our body awareness

For more information, visit the UniWell website.

<https://uniwellproject.com>

References

- [1] Moussavi, Z. M. K. (2006). *Fundamentals of respiratory sounds and analysis* (Vol. 8). Morgan & Claypool Publishers.
- [2] Peate, I. (2018). Anatomy and physiology, 10. The respiratory system. *British Journal of Healthcare Assistants*, 12(4), 178–181.
- [3] Russo MA, Santarelli DM, O'Rourke D. The physiological effects of slow breathing in the healthy human. *Breathe*. 2017;13(4):298–309..
- [4] Vostatek, P., Novak, D., Rychnovsky, T., et al. (2013). Diaphragm postural function analysis using magnetic resonance imaging. *PLOS ONE*, 8, e56724.
- [5] Stromberg, S. E., Russell, M. E., & Carlson, C. R. (2015). Diaphragmatic breathing and its effectiveness for the management of motion sickness. *Aerospace Medicine and Human Performance*, 86, 452–457.
- [6] Bernardi, L., Gabutti, A., Porta, C., et al. (2001). Slow breathing reduces chemoreflex response to hypoxia and hypercapnia, and increases baroreflex sensitivity. *Journal of Hypertension*, 19, 2221–2229.
- [7] Dick, T. E., Mims, J. R., Hsieh, Y. H., et al. (2014). Increased cardio-respiratory coupling evoked by slow deep breathing can persist in normal humans. *Respiratory Physiology & Neurobiology*, 204, 99–111.
- [8] Radaelli, A., Raco, R., Perfetti, P., et al. (2004). Effects of slow, controlled breathing on baroreceptor control of heart rate and blood pressure in healthy men. *Journal of Hypertension*, 22, 1361–1370.
- [9] Pitzalis, M. V., Mastropasqua, F., Massari, F., et al. (1998). Effect of respiratory rate on the relationships between RR interval and systolic blood pressure fluctuations: A frequency-dependent phenomenon. *Cardiovascular Research*, 38, 332–339.

- [10] Lorenzi-Filho, G., Dajani, H. R., Leung, R. S., et al. (1999). Entrainment of blood pressure and heart rate oscillations by periodic breathing. *American Journal of Respiratory and Critical Care Medicine*, 159, 1147–1154.
- [11] Chang, Q., Liu, R., & Shen, Z. (2013). Effects of slow breathing rate on blood pressure and heart rate variabilities. *International Journal of Cardiology*, 169, e6–e8.
- [12] Fincham, G. W., et al. (2023). Effect of breathwork on stress and mental health: A meta-analysis of randomised-controlled trials. *Scientific Reports*, 13(1), 432.
- [13] Russo, M. A., Santarelli, D. M., & O'Rourke, D. (2017). The physiological effects of slow breathing in the healthy human. *Breathe (Sheffield)*, 13(4), 298–309.
- [14] Li, T. T., Wang, H. Y., Zhang, H., Zhang, P. P., Zhang, M. C., Feng, H. Y., et al. (2023). Effect of breathing exercises on oxidative stress biomarkers in humans: A systematic review and meta-analysis.
- [15] Lavretsky, H., & Datta, T. (2022). Neurobiological mechanisms of mind-body medicine. *Integrative Medicine (Encinitas)*, 39(Oct), 22–24.
- [16] Önal, G. F. (2023). Gündelik hayatta nefesin önemi ve mesleki nefes çalışmaları. *Ulusal Toplum Bilimleri Dergisi*, 7(2), 63–83.
- [17] Hamasaki, H. (2020). Effects of diaphragmatic breathing on health: A narrative review. *Medicines (Basel)*, 7(10), 65.
- [18] Cappa, S. F., et al. (2020). Breathing patterns and respiratory muscle activity during stress. *Journal of Applied Physiology*, 129(6), 1234–1244.
- [19] West, J. B. (2012). *Respiratory physiology: The essentials* (9th ed.). Lippincott Williams & Wilkins.
- [20] Ahmed, A., Devi, R. G., & Priya, A. J. (2021). Effect of box breathing technique on lung function test. *Journal of Pharmaceutical Research International*, 33(58A), 25–31.

[22] Aktaş, G. K., & İlgin, V. E. (2023). The effect of deep breathing exercise and 4–7–8 breathing techniques applied to patients after bariatric surgery on anxiety and quality of life. *Obesity Surgery*, 33(3), 920–929.

[23] Tavoian, D., & Craighead, D. H. (2023). Deep breathing exercise at work: Potential applications and impact. *Frontiers in Physiology*.

[24] Cho, H., Ryu, S., Noh, J., & Lee, J. (2016). The effectiveness of daily mindful breathing practices on test anxiety of students. *PLOS ONE*, 11(10), e0164822.

Recommended Resources

- Gerbarg, P. L., Brown, R. P., & Streeter, C. C. (2023). Breath–body–mind core techniques to manage medical student stress. *Frontiers in Public Health*, 11, 1235529.
- Nestor, J. (2020). *Breath: The new science of a lost art*. Riverhead Books.

Glossary

- **Alveoli:** Tiny air sacs in the lungs where the exchange of oxygen and carbon dioxide takes place between the air and the blood.
- **Amygdala:** A region in the brain involved in emotional processing, particularly fear and stress responses. Controlled breathing can help reduce its overactivation.
- **Breathing Rate:** The number of breaths taken per minute; an indicator of physiological and emotional states.
- **Carbon Dioxide (CO₂):** A waste gas produced by cells and exhaled during respiration. Its balance with oxygen is vital for maintaining blood pH.
- **Diaphragm:** A dome-shaped muscle separating the thoracic and abdominal cavities. It is the primary muscle responsible for inhalation.
- **Exhalation (Expiration):** The process of breathing out air from the lungs, which eliminates carbon dioxide and supports parasympathetic activation.
- **External Intercostal Muscles:** Muscles located between the ribs that help lift the rib cage during inhalation, expanding the thoracic cavity.
- **Gas Exchange:** The process through which oxygen is absorbed into the bloodstream and carbon dioxide is released from it in the alveoli.
- **Heart Rate Variability (HRV):** A physiological measure of the variation in time between heartbeats, influenced by breathing and nervous system activity. Higher HRV is associated with better stress resilience.
- **Inhalation (Inspiration):** The act of drawing air into the lungs. It involves contraction of the diaphragm and expansion of the chest cavity.
- **Nasal Cavity:** The airway passage through which air enters and is filtered, warmed, and humidified before reaching the lungs.

- **Parasympathetic Nervous System (PNS):** A division of the autonomic nervous system responsible for promoting relaxation, reducing heart rate, and restoring balance after stress.
- **Pharynx:** Part of the throat that serves as a passageway for both air and food, connecting the nasal cavity to the larynx.
- **pH Balance:** A measure of acidity or alkalinity in the blood. Breathing helps regulate pH by controlling CO₂ levels.
- **Respiratory System:** The group of organs (nose, pharynx, larynx, trachea, bronchi, lungs) responsible for breathing and gas exchange.
- **Trachea:** Also called the windpipe; it connects the larynx to the bronchi, allowing air passage to the lungs.
- **Vagus Nerve:** A major cranial nerve connecting the brain to internal organs. Deep breathing stimulates it, promoting calmness and parasympathetic activity.
- **Ventilation:** The mechanical process of moving air into (inhalation) and out of (exhalation) the lungs.
- **Oxidative Stress:** A condition resulting from an imbalance between free radicals and antioxidants. Controlled breathing can reduce oxidative stress and promote cellular health.
- **Stress Hormones (e.g., Cortisol):** Chemicals released in response to stress. Slow breathing reduces their secretion and promotes relaxation.
- **Sympathetic Nervous System (SNS):** The part of the autonomic nervous system responsible for activating the body's "fight or flight" response; counterbalanced by parasympathetic activation during deep breathing.

- **Parasympathetic Nervous System (PNS):** A division of the autonomic nervous system responsible for promoting relaxation, reducing heart rate, and restoring balance after stress.
- **Pharynx:** Part of the throat that serves as a passageway for both air and food, connecting the nasal cavity to the larynx.
- **pH Balance:** A measure of acidity or alkalinity in the blood. Breathing helps regulate pH by controlling CO₂ levels.
- **Respiratory System:** The group of organs (nose, pharynx, larynx, trachea, bronchi, lungs) responsible for breathing and gas exchange.
- **Trachea:** Also called the windpipe; it connects the larynx to the bronchi, allowing air passage to the lungs.
- **Vagus Nerve:** A major cranial nerve connecting the brain to internal organs. Deep breathing stimulates it, promoting calmness and parasympathetic activity.
- **Ventilation:** The mechanical process of moving air into (inhalation) and out of (exhalation) the lungs.
- **Oxidative Stress:** A condition resulting from an imbalance between free radicals and antioxidants. Controlled breathing can reduce oxidative stress and promote cellular health.
- **Stress Hormones (e.g., Cortisol):** Chemicals released in response to stress. Slow breathing reduces their secretion and promotes relaxation.
- **Sympathetic Nervous System (SNS):** The part of the autonomic nervous system responsible for activating the body's "fight or flight" response; counterbalanced by parasympathetic activation during deep breathing.

Project Coordinator

Yıldız Technical University, YTU
Türkiye



Project Partners

Antalya Bilim University, ABU
Türkiye



University of Lisbon, U Lisbon
Portugal



University of Palermo, UNIPA
Italy



Coachmotion
Türkiye



Eu&Pro
Czechia



Technovias
Estonia





Physical and Mental Awareness for University Students

The project aims to enhance the mental wellness of university students by fostering cross-border collaboration and promoting holistic educational methodologies. Recognizing the unique stressors faced by today's students, we're committed to crafting resources that address emotional, psychological, and social well-being. By integrating traditional and digital tools, we seek to provide supportive environments, resources, and practices, empowering students to thrive academically and personally.

We anticipate the project to yield a comprehensive app packed with resources on mental wellness tailored for university students. The interactive content, from videos to e-books and podcasts, will foster improved mental health awareness and practices. As a result, students will gain enhanced coping strategies, resilience, and emotional intelligence.