Academic Article

Breathing Techniques for Enhancing Psychological Resilience: An Integrative Literature Review of Scientific and Buddhist Trilakkhana Principles

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Abstract: This integrative literature review aims to explore the connections between modern scientific breathing techniques and Buddhist principles in enhancing psychological resilience. Through analysis of biological and psychological mechanisms related to breathing, including the application of Trilakkhana principles in developing psychological resilience. From the compilation of research articles, five main breathing techniques effective for psychological resilience were summarized: cyclic sighing, resonance frequency breathing, mindfulness of breathing (Anapanasati), box breathing, and diaphragmatic breathing. All techniques affect the improvement of Heart Rate Variability (HRV), creation of autonomic nervous system balance, and development of emotional regulation abilities. The connection with Trilakkhana principles shows that Anicca (impermanence), Dukkha (suffering), and Anatta (non-self) can serve as an effective conceptual framework for building psychological resilience through breathing practice. The application of breathing techniques can be used in various contexts, from crisis situations, education, workplace settings, to public health systems. The integration between modern science and religious principles opens opportunities for developing effective and comprehensive approaches to creating sustainable psychological resilience.

Keywords: Psychological resilience, breathing techniques, Trilakkhana, heart rate variability, Buddhist psychology

1. Introduction

Currently, Thailand faces a mental health crisis at a critical level, with more than 10 million people affected by mental health problems (Warat Chotipityasunon, 2024). Patients with depression aged 15 years and above number 1.5 million (Thai Depression Knowledge Center, 2023), and suicide completion statistics average 14 people per day, along with 85 suicide attempts per day (National Suicide Prevention Center, 2024). This situation reflects the urgent need to develop effective mental health care mechanisms.

Psychological resilience is considered a crucial characteristic for quality living (Fletcher & Sarkar, 2013), referring to the ability to adapt, recover, and grow from difficult experiences. Psychological resilience is not only a desirable skill but also a fundamental

competency necessary for coping with change and uncertainty in life, especially in the post-COVID-19 era where mental health problems tend to increase (Kepenek-Varol et al., 2022).

Breathing is a natural mechanism that humans can voluntarily control and has been proven to be an effective tool for adjusting mental states to enhance psychological resilience. Scientific research has confirmed that breath control directly affects the autonomic nervous system and influences the increase in Heart Rate Variability (HRV), which is an important indicator reflecting emotional balance and the ability to recover from stress states (Laborde et al., 2017; Thayer & Lane, 2009).

Theravada Buddhism has established the foundation for using breath as a tool for deep mental development for over 2,500 years through the practice of Anapanasati, which aims to promote harmonious mind-body integration (Analayo, 2003). This approach not only helps promote physical and mental well-being but also deeply connects with the spiritual dimension of practitioners (Kitti Chittreethinn et al., 2021; Phra Nathawutti Phanthalee et al., 2021). Therefore, breathing is not merely a biological process but also a practice approach with potential for therapy, development, and elevation of mental states in all dimensions.

This literature review aims to study and analyze research articles related to breathing techniques for enhancing psychological resilience by conducting an integration of knowledge between modern health science and Buddhist principles, particularly the Trilakkhana principles consisting of Anicca, Dukkha, and Anatta. The purpose is to create guidelines for research studies in developing evidence-based methods that can be appropriately applied in contemporary social contexts at individual, organizational, and overall societal levels.

2. Psychological Resilience

The term "resilience" originates from the Latin "resilire," meaning "to bounce back," and currently means "the ability to withstand or recover quickly from difficult circumstances" (Resilience Definition, n.d.). This concept aligns with principles in physics referring to an object's ability to return to its original shape after receiving pressure (Fletcher & Sarkar, 2013).

Psychological resilience refers to the abilities and mental processes that help individuals cope, adapt, and recover effectively when encountering hardship, stress, or threatening situations in life. Psychological resilience not only means enduring difficulties but also includes the ability to maintain good mental health and, in some cases, the ability to grow and develop positively from those difficult experiences (Fletcher & Sarkar, 2013).

2.1 Breathing Mechanisms and Psychological Resilience

Breathing is a process directly connected to the autonomic nervous system, which is divided into the sympathetic nervous system responsible for stress responses and the parasympathetic nervous system responsible for restoration and relaxation (Thayer & Lane, 2009). Inhalation stimulates the sympathetic nervous system, increasing heart rate, while exhalation stimulates the parasympathetic nervous system, decreasing heart rate. This phenomenon is called Respiratory Sinus Arrhythmia (RSA), which is the foundation of Heart Rate Variability (Laborde et al., 2017). Breathing also positively affects the body in multiple systems. In the nervous system, it helps the prefrontal cortex function better and reduces the size of the amygdala, which responds to stress (Hölzel et al., 2011). In the endocrine system, it helps reduce cortisol hormone and increase DHEA (Dehydroepiandrosterone) hormone (Ma et al., 2017). In the immune system, it helps stimulate Natural Killer white blood cells and reduce inflammatory substances (Zope & Zope, 2013).

This article focuses on studying the role of breathing that affects autonomic nervous system function, with the important variable being Heart Rate Variability (HRV), which reflects the unequal time intervals between heartbeats, indicating autonomic nervous system

balance and having a significant relationship with emotional regulation abilities and psychological resilience (Beauchaine & Thayer, 2015).

3. Breathing Techniques for Enhancing Psychological Resilience

Research studies have compiled breathing techniques that affect psychological resilience creation into five main techniques:

3.1 Cyclic Sighing

A technique involving double inhalation through the nose, followed by a slow and long exhalation through the mouth for 5 minutes per session. Studies found this technique more effective than mindfulness breathing meditation in both mental and physical aspects, suitable for rapid emotional control and acute stress management (Yilmaz Balban et al., 2023).

3.2 Resonance Frequency Breathing

Breathing at approximately 5-6 breaths per minute according to individual resonance frequency values. Studies found that breathing according to individual resonance frequency is an important component of increasing HRV and creating autonomic nervous system balance, and found that practicing this technique for 15 minutes can immediately increase physical and emotional flexibility (Steffen et al., 2017).

3.3 Mindfulness of Breathing (Anapanasati)

The main meditation technique of Theravada Buddhism, meaning mindfulness of breathing or focusing on the breath (Nandarathana & Ranjan, 2024; Brewer et al., 2011). It helps reduce anxious thinking and rumination, enhances present-moment awareness, which is an important component of psychological resilience (Brewer et al., 2011).

The Anapanasati breathing practice according to Buddhist tradition has 16 stages (Sombat Siripatanakul, 2022). For application in stress reduction or emotional flexibility, the principle is to focus on natural, relaxed breathing in and out (Nandarathana & Ranjan, 2024). According to the Tripitaka: "Set the body straight, maintain mindfulness in front, be mindful breathing in, be mindful breathing out" (Mahachulalongkornrajavidyalaya University, 2016). Studies show that practicing 10 days, 20-30 minutes per day, can significantly increase HRV values (Kirk & Axelsen, 2020).

3.4 Box Breathing

This technique emphasizes rhythm and equality of breathing, such as 4-4-4 breathing (inhale 4 seconds, hold 4 seconds, exhale 4 seconds) or 4-7-8 (Marchant et al., 2025). It helps promote the parasympathetic system and reduce sympathetic system activity, affecting brainwave changes and HRV (Bentley et al., 2023). RCT studies found it can reduce anxiety and regulate emotions well, but is less effective than cyclic sighing (Balban et al., 2023) and less than resonance frequency breathing (Marchant et al., 2025).

3.5 Diaphragmatic Breathing

A technique that stimulates diaphragm function to enhance the parasympathetic nervous system. The method involves slow, deep breathing through the nose, allowing the abdomen to expand while keeping the chest still, then slowly exhaling to contract the abdomen (Zaccaro et al., 2018). Practicing 6-10 times/minute, 10 minutes per day for 4+ weeks helps reduce blood pressure, balance the autonomic nervous system, and increase HRV, enhancing psychological resilience and reducing stress responses (Yau & Loke, 2021; Gerritsen & Band, 2018).

Effectiveness Ranking Based on research data, effectiveness can be ranked as follows: 1) Cyclic Sighing has the highest effectiveness with immediate results, 2) Resonance Frequency Breathing provides the best long-term results, 3) Anapanasati and Diaphragmatic Breathing are suitable for long-term development, and 4) Box Breathing provides moderate results but is easy to use, suitable for beginners. Technique selection depends on goals, situations, and practitioner abilities.

Table 1: Comparison of Breathing Techniques for Enhancing Psychological Resilience

Technique	Duration	Resilience Building Effectiveness	Suitable Situations	Primary Mechanism	Precautions
Cyclic Sighing	5 minutes/session	Best - significantly better than Anapanasati meditation statistically	Rapid emotional control, acute stress, increasing sense of control	Double inhalation + long exhalation stimulates parasympathetic system	Must practice correct rhythm
Resonance Frequency Breathing	15 minutes for immediate results	Very good - increases HRV and effectively balances autonomic nervous system	Increasing long-term physical and emotional flexibility	5-6 breaths/minute according to individual resonance frequency	Need to find appropriate frequency for each person
Mindfulness of Breathing (Anapanasati)	10 days, 20-30 minutes/day	Good - increases HRV, reduces anxious thinking, develops present-moment awareness	Long-term stress reduction, mindfulness and concentration development	Focusing on natural breathing, stimulates parasympathetic system	Requires continuous practice
Box Breathing	At least 5 minutes/session, 1-2 times/day, at least 1 week	Moderate - better than natural breathing but less than Cyclic Sighing	General mood regulation, anxiety reduction	Regular rhythm (4-4-4 or 4-7-8) helps control autonomic nervous system	HRV increases less than Resonance Frequency
Diaphragmatic Breathing	At least 10 minutes/day, 4+ weeks	Good - increases HRV, reduces blood	Long-term stress reduction, stress-	Primarily uses diaphragm (6-10	Must practice correct posture

Technique	Duration	Resilience Building Effectiveness	Suitable Situations	Primary Mechanism	Precautions
		pressure, balances autonomic nervous system	related health problems	times/minute) stimulates parasympathetic system	

In Thailand, the principles of deep and slow breathing have been applied in the Breathe-Embrace-Name (B.E.N) technique for rapid emotional flexibility in the "Resilience Builders: Wellness Recovery Skills" curriculum organized by the Thai Health Promotion Foundation (ThaiHealth) and the Volunteer Spirit Bank for Thailand's Happiness to build psychological resilience for medical personnel in the post-COVID-19 era.

4. Benefits of Breathing Practice on Psychological Resilience

4.1 Reducing Anxiety and Managing Stress

Breathing practice creates effective stress coping mechanisms (Fincham et al., 2023), especially in crisis situations such as COVID-19 fear, which was found to significantly reduce anxiety and stress affecting psychological resilience and improve sleep quality (Kepenek-Varol et al., 2022; Morgan et al., 2024).

4.2 Improving Emotional Regulation

Slow breathing affects the reduction of stress, anxiety, and depression through increasing HRV, which is an important mechanism in emotional state regulation and affects the parasympathetic nervous system and interoception (Fincham et al., 2023; Marchant et al., 2025; Shao et al., 2024).

4.3 Sense of Control

Breathing practice enhances confidence in managing body systems and emotions, resulting in increased psychological resilience (Kurdziel et al., 2025; Zaccaro et al., 2018).

4.4 Applications in Various Contexts

1) **Crisis Situations** - The application of breathing techniques is a convenient, economical, and effective method for significantly reducing anxiety statistically (Kepenek-Varol et al., 2022).
2) **Workplace Settings** - Deep breathing practice for 1-5 minutes during breaks or before meetings is a low-cost method applicable to all types of organizations (Tavoian & Craighead, 2023). It can also be used with HRV Biofeedback technology to enhance training effectiveness (Vagedes et al., 2024).
3) **Educational Systems** - Mindful breathing practice for 6 minutes before exams can effectively reduce student anxiety (Sillevis et al., 2025). For elementary students, focusing on breathing for 3 minutes per day for 9 weeks can significantly increase mathematics achievement (Voltmer et al., 2023).
4) **Public Health Systems** - Resonance frequency breathing practice at 5-6 breaths per minute for 8 weeks can reduce stress and burnout, increase empathy, and effectively improve mental health of medical personnel (Wang et al., 2023; DeGraves et al., 2024; Sos & Melton, 2024).

From the above research studies, it can be concluded that the application of breathing techniques in various contexts demonstrates high potential for creating psychological resilience at all levels, whether individual, organizational, and societal, with advantages in practical convenience, no need for special equipment, and short training duration.

5. Connection with Buddhist Principles: Trilakkhana and Psychological Resilience

Trilakkhana is a fundamental principle in Buddhism that explains the reality of all things as having characteristics of impermanence (Anicca), suffering (Dukkha), and non-self (Anatta). This serves as a guide for students to consider the nature of the world according to reality, leading to understanding of uncertainty and emptiness of all phenomena (Phra Promkunaphon (P.A. Payutto), 2017, p. 89). Therefore, it can be said that those who understand Trilakkhana principles tend to have psychological resilience because they can accept change, cope with suffering, and not cling to things beyond control, which aligns with characteristics of psychological resilience as stated by Fletcher and Sarkar (2013).

5.1 Breathing Practice for Enhancing Psychological Resilience and Accessing Trilakkhana Principles

(1) **Anicca and Flexibility toward Change** The principle of Anicca is understanding that everything in nature changes constantly, with nothing remaining permanently fixed. Breathing practice helps create acceptance of change and present-moment awareness, reducing rumination about past and future. Breathing practice helps reduce default mode network (DMN) activity that induces repetitive thinking, creating acceptance of change and present-moment awareness (Hehr et al., 2022).

(2) **Dukkha and Resilience toward Suffering** Breathing practice is effective in recovering from mental suffering, reducing stress, anxiety, and depression (Fincham et al., 2023). Resonance frequency breathing helps increase psychological resilience and emotional differentiation ability (DeGraves et al., 2024) and can transform suffering perspectives into growth opportunities (Tedeschi, 2023).

(3) **Anatta and Reducing Emotional Attachment** Mindfulness practice through breathing reduces self-referencing thinking processes, allowing the mind to process and perceive emotions freely without clinging to self-identity. Suffering can be reduced when not clinging to phenomena as self (Santarnecchi et al., 2014). Even 8 weeks of breathing practice can significantly change brain responses to stimuli (Desbordes et al., 2012).

Breathing practice integrated with Trilakkhana principles is an effective approach for developing psychological resilience. Understanding all three components of Trilakkhana principles - impermanence, suffering, and non-permanent self - helps practitioners manage emotional challenges more effectively.

Scientific research has confirmed the validity of these principles by showing that breathing practice affects biological mechanisms in directions conducive to reducing emotional attachment and increasing capacity to cope with life's challenging situations. This practice approach demonstrates the possibility of applying religious principles in modern contexts with scientific evidence as foundation, and can be applied to create sustainable psychological resilience at both individual and organizational levels.

8. Conclusion

This literature review demonstrates the potential of breathing techniques in enhancing psychological resilience through the integration of scientific evidence and Buddhist principles.

Physiological and Psychological Mechanisms Breathing affects psychological resilience through four important mechanisms: improving Heart Rate Variability (HRV), which serves as an indicator of autonomic nervous system balance (Thayer & Lane, 2009; Laborde et al., 2017), creating balance between sympathetic and parasympathetic nervous systems, developing present-moment awareness, and enhancing sense of control over situations (Kurdziel et al., 2025; Zaccaro et al., 2018).

Effective Breathing Techniques Comparative analysis reveals that all five breathing techniques have distinct advantages. Cyclic Sighing provides immediate results and highest effectiveness for acute stress management. Resonance Frequency Breathing provides the most sustainable long-term results in creating autonomic nervous system balance. Mindfulness of Breathing (Anapanasati) and Diaphragmatic Breathing are suitable for long-term psychological resilience development through continuous practice, while Box Breathing is an easily learned technique suitable for beginners.

Applications in Diverse Contexts Breathing techniques can be effectively applied in various situations, from acute crisis management, enhancing learning efficiency in educational systems, reducing stress in workplace settings, to preventing burnout in public health personnel. The convenience of practice, no need for special equipment, and short training duration make these techniques accessible and practically usable in daily life.

Future Research Directions

Neuroscientific discoveries have clearly confirmed Buddhist mental development principles, especially creating psychological resilience through breathing practice and mindfulness of breathing. Research shows these practices affect biological mechanisms in directions conducive to emotional control and effective stress management.

Integration between modern science and religious principles provides opportunities for developing effective tools for creating psychological resilience. This approach not only has solid scientific foundation but also meets spiritual needs and is accessible to all social groups without being limited to those with religious faith, resulting in acceptance and application in diverse contexts including education, work, healthcare, and organizational development.

Future research that can integrate religious principles such as Trilakkhana with breathing practice for psychological resilience and systematic scientific measurement will be beneficial for long-term human and social potential development.

References

Analayo, B. (2003). *Satipatthana: The direct path to realization*. Windhorse Publications.

Balban, M. Y., Neri, E., Kogon, M. M., Weed, L., Nouriani, B., Jo, B., Holl, G., Zeitzer, J. M., Spiegel, D., & Huberman, A. D. (2023). Brief structured respiration practices enhance mood and reduce physiological arousal. *Cell Reports Medicine*, *4*(1), 100895. https://doi.org/10.1016/j.xcrm.2022.100895

Beauchaine, T. P., & Thayer, J. F. (2015). Heart rate variability as a transdiagnostic biomarker of psychopathology. *International Journal of Psychophysiology*, *98*(2), 338-350. https://doi.org/10.1016/j.ijpsycho.2015.08.004

Bentley, T. G. K., D'Andrea-Penna, G., Rakic, M., Arce, N., LaFaille, M., Berman, R., Cooley, K., & Sprimont, P. (2023). Breathing practices for stress and anxiety reduction: Conceptual framework of implementation guidelines based on a systematic review of the published literature. *Brain Sciences*, *13*(12), 1612. https://doi.org/10.3390/brainsci13121612

Brewer, J. A., Worhunsky, P. D., Gray, J. R., Tang, Y.-Y., Weber, J., & Kober, H. (2011). Meditation experience is associated with differences in default mode network activity and connectivity. *Proceedings of the National Academy of Sciences of the United States of America*, *108*(50), 20254-20259. https://doi.org/10.1073/pnas.1112029108

DeGraves, B. S., Titley, H., Duan, Y., Thorne, T. E., Banerjee, S., Ginsburg, L., Salma, J., Hegadoren, K., Angel, C., Keefe, J., Lanius, R., & Estabrooks, C. A. (2024). Workforce resilience supporting staff in managing stress: A coherent breathing intervention for the long-term care workforce. *Journal of the American Geriatrics Society*, *72*(3), 753-766. https://doi.org/10.1111/jgs.18727

Desbordes, G., Negi, L. T., Pace, T. W. W., Wallace, B. A., Raison, C. L., & Schwartz, E. L. (2012). Effects of mindful-attention and compassion meditation training on amygdala response to emotional stimuli in an ordinary, non-meditative state. *Frontiers in Human Neuroscience*, *6*, 292. https://doi.org/10.3389/fnhum.2012.00292

Fincham, G. W., Strauss, C., Montero-Marin, J., & Cavanagh, K. (2023). Effect of breathwork on stress and mental health: A meta-analysis of randomised-controlled trials. *Scientific Reports*, *13*(1), 432. https://doi.org/10.1038/s41598-022-27247-y

Fletcher, D., & Sarkar, M. (2013). Psychological resilience: A review and critique of definitions, concepts, and theory. *European Psychologist*, *18*(1), 12-23. https://doi.org/10.1027/1016-9040/a000124

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. https://doi.org/10.3389/fnhum.2018.00397

Hehr, A., Iadipaolo, A. S., Morales, A., Cohen, C., Taub, J. W., Harper, F. W. K., Goldberg, E., Bluth, M. H., Rabinak, C. A., & Marusak, H. A. (2022). Meditation reduces brain activity in the default mode network in children with active cancer and survivors. *Pediatric Blood & Cancer*, *69*(10), e29917. https://doi.org/10.1002/pbc.29917

Hölzel, B. K., Carmody, J., Vangel, M., Congleton, C., Yerramsetti, S. M., Gard, T., & Lazar, S. W. (2011). Mindfulness practice leads to increases in regional brain gray matter density. *Psychiatry Research*, *191*(1), 36-43. https://doi.org/10.1016/j.pscychresns.2010.08.006

Kepenek-Varol, B., Zeren, M., Dinçer, R., & Erkaya, S. (2022). Breathing and relaxation exercises help improving fear of COVID-19, anxiety, and sleep quality: A randomized controlled trial. *Journal of Integrative and Complementary Medicine*, *28*(7), 579-586. https://doi.org/10.1089/jicm.2021.0381

Kirk, U., & Axelsen, J. L. (2020). Heart rate variability is enhanced during mindfulness practice: A randomized controlled trial involving a 10-day online-based mindfulness intervention. *PLoS One*, *15*(12), e0243488. https://doi.org/10.1371/journal.pone.0243488

Kurdziel, L., McDevitt, L., & Hardway, C. (2025). Acute effects of slow-paced breathing on emotion regulation: A pilot study. *Psychological Reports*, *134*(1), 332941251329856. https://doi.org/10.1177/00332941251329856

Laborde, S., Mosley, E., & Thayer, J. F. (2017). Heart rate variability and cardiac vagal tone in psychophysiological research—Recommendations for experiment planning, data analysis, and data reporting. *Frontiers in Psychology*, *8*, 213. https://doi.org/10.3389/fpsyg.2017.00213

Ma, X., Yue, Z.-Q., Gong, Z.-Q., Zhang, H., Duan, N.-Y., Shi, Y.-T., Wei, G.-X., & Li, Y.-F. (2017). The effect of diaphragmatic breathing on attention, negative affect and stress in healthy adults. *Frontiers in Psychology*, *8*, 874. https://doi.org/10.3389/fpsyg.2017.00874

Marchant, J., Khazan, I., Cressman, M., & Steffen, P. (2025). Comparing the effects of square, 4-7-8, and 6 breaths-per-minute breathing conditions on heart rate variability, CO2 levels, and mood. *Applied Psychophysiology and Biofeedback*, *50*(2), 261-276. https://doi.org/10.1007/s10484-025-09688-z

Morgan, S. P., Lengacher, C. A., & Seo, Y. (2024). A systematic review of breathing exercise interventions: An integrative complementary approach for anxiety and stress in adult populations. *Journal of Holistic Nursing*, *42*(4), 8980101241273860. https://doi.org/10.1177/08980101241273860

Nandarathana, R. N., & Ranjan, J. K. (2024). The application of Theravāda Buddhist meditation practices and techniques in mindfulness-based interventions. *Vidyodaya Journal of Humanities and Social Sciences*, *9*(1). https://journals.sjp.ac.lk/index.php/vjhss/article/view/7424

Resilience Definition. (n.d.). Oxford Learner's Dictionaries. https://www.oxfordlearnersdictionaries.com/definition/english/resilience

Santarnecchi, E., D'Arista, S., Egiziano, E., Gardi, C., Petrosino, R., Vatti, G., Reda, M., & Rossi, A. (2014). Interaction between neuroanatomical and psychological changes after mindfulness-based training. *PLoS One*, *9*(10), e108359. https://doi.org/10.1371/journal.pone.0108359

Shao, R., Man, I. S. C., & Lee, T. M. C. (2024). The effect of slow-paced breathing on cardiovascular and emotion functions: A meta-analysis and systematic review. *Mindfulness*, *15*(1), 1-18. https://doi.org/10.1007/s12671-023-02294-2

Sillevis, R., Weiss, V., & Reuter, P. (2025). Do mindful breathing exercises in the classroom have a positive impact on student anxiety and testing experience? *HAPS Educator*, *29*(1), 5-14. https://doi.org/10.21692/haps.2025.001

Sos, T., & Melton, B. (2024). Comparison of mindfulness practices for effectiveness of stress and burnout reduction in healthcare staff. *Journal of Holistic Nursing*, *42*(4), 333-343. https://doi.org/10.1177/08980101231219304

Steffen, P. R., Austin, T., DeBarros, A., & Brown, T. (2017). The impact of resonance frequency breathing on measures of heart rate variability, blood pressure, and mood. *Frontiers in Public Health*, *5*, 222. https://doi.org/10.3389/fpubh.2017.00222

Tavoian, D., & Craighead, D. H. (2023). Deep breathing exercise at work: Potential applications and impact. *Frontiers in Physiology*, *14*, 1040091. https://doi.org/10.3389/fphys.2023.1040091

Tedeschi, R. G. (2023). The post-traumatic growth approach to psychological trauma. *World Psychiatry*, *22*(2), 328-329. https://doi.org/10.1002/wps.21093

Thayer, J. F., & Lane, R. D. (2009). Claude Bernard and the heart-brain connection: Further elaboration of a model of neurovisceral integration. *Neuroscience & Biobehavioral Reviews*, *33*(2), 81-88. https://doi.org/10.1016/j.neubiorev.2008.08.004

Vagedes, J., Szőke, H., Islam, M., Sobh, M., Kuderer, S., Khazan, I., & Vagedes, K. (2024). Mobile heart rate variability biofeedback for work-related stress in employees and the influence of instruction format (digital or live) on training outcome: A non-randomized controlled trial. *Applied Psychophysiology and Biofeedback*, *50*(1), 79-93. https://doi.org/10.1007/s10484-024-09671-0

Voltmer, K., Hondrich, F., & von Salisch, M. (2023). Daily breath-based mindfulness exercises in a randomized controlled trial improve primary school children's performance in arithmetic. *Scientific Reports*, *13*(1), 22169. https://doi.org/10.1038/s41598-023-49354-0

Wang, Q., Wang, F., Zhang, S., Liu, C., Feng, Y., & Chen, J. (2023). Effects of a mindfulness-based interventions on stress, burnout in nurses: A systematic review and meta-analysis. *Frontiers in Psychiatry*, *14*, 1218340. https://doi.org/10.3389/fpsyt.2023.1218340

Yau, A., & Loke, A. Y. (2021). Effects of diaphragmatic breathing training on anxiety, depression, and stress among pregnant women: A systematic review and meta-analysis. *Frontiers in Psychology*, *12*, 720090. https://doi.org/10.3389/fpsyg.2021.720090

Yilmaz Balban, M., Neri, E., Kogon, M. M., Weed, L., Nouriani, B., Jo, B., Holl, G., Zeitzer, J. M., Spiegel, D., & Huberman, A. D. (2023). Brief structured respiration practices enhance mood and reduce physiological arousal. *Cell Reports Medicine*, *4*(1), 100895. https://doi.org/10.1016/j.xcrm.2022.100895

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. https://doi.org/10.3389/fnhum.2018.00353

Zope, S. A., & Zope, R. A. (2013). Sudarshan kriya yoga: Breathing for health. *International Journal of Yoga*, *6*(1), 4-10. https://doi.org/10.4103/0973-6131.105935

Kitti Chittreethinn, Somphochon Aiamsuphasit, & Man Suesoongern. (2021). Effects of Anapanasati practice on reducing anxiety among regular military personnel. Journal of Buddhist Psychology, 6(1), 30-40. https://so03.tci-thaijo.org/index.php/jbp/article/view/251270

Mahachulalongkornrajavidyalaya University. (2016). Tripitaka Volume 10 (Mahachula Edition). https://84000.org/tipitaka/pitaka_item/read_page.php?book=10&page=301&pages=4&edition=mcu

National Suicide Prevention Center. (2024). Report on suicide situation in Thailand, fiscal year 2023. https://suicide.dmh.go.th/news/view.asp?id=92

Phra Nathawutti Phanthalee, Phra Khru Winaitharawornchod Payutto, & Chanatip Sritho. (2021). Anapanasati: The breath of awakening according to Buddhist principles. Journal of Buddhism and Philosophy, 4(2), 1-13.

Phra Promkunaphon (P.A. Payutto). (2017). Dictionary of Buddhism: Comprehensive Dharma Edition (23rd ed.). Mahamakut Rajavidyalaya University Press. https://www.watnyanaves.net/uploads/File/books/pdf/dictionary_of_buddhism_pra-muan-dhaama.pdf

Sombat Siripatanakul. (2022). Anapanasati meditation: Breath contemplation from ordinary person to noble one. Journal of Buddhist Innovation Review, 3(1), 11-20.

Thai Depression Knowledge Center. (2023). Report on depression situation and access to treatment in Thailand. Department of Mental Health, Ministry of Public Health. https://www.thaipbs.or.th/news/content/324887

Thai Health Promotion Foundation. (n.d.). "Resilience Builders: Wellness Recovery Skills" curriculum for medical personnel. https://www.happinessisthailand.com/2022/08/09/resilience-builders/

Warat Chotipityasunon. (2024, March 30). Thai mental health situation and problem-solving approaches. In 2nd National Health Promoting University Academic Conference. https://www.hfocus.org/content/2024/03/30088