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# Using Pranayama For Better Sleep And Relaxation: A Review Paper

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**Abstract**
Purpose:
This research investigates the effects of pranayama, a traditional yogic breathing method, on relaxation and sleep quality in a natural and drug-free manner. Today's population suffers from sleep disorders because of stress, worry, or age-related issues, and traditional sleep aids frequently have negative side effects. Pranayama provides a soothing, all-encompassing substitute that emphasizes breath control to soothe the body and mind.

**Methods:**
Its effectiveness was examined by reviewing a large number of papers published between 2007 and 2024. Systematic reviews, randomised controlled trials (RCTs), and experimental studies were among them. To evaluate sleep outcomes, the research used well-known instruments like the Pittsburgh Sleep Quality Index (PSQI) and looked at a variety of Pranayama techniques, including Anulom-Vilom, Savitri Pranayama, and Bhastrika.

**Result:**
The findings revealed that regular practice of Pranayama can significantly improve sleep by reducing stress levels, calming the nervous system, and helping people fall asleep faster and stay asleep longer. Techniques like slow breathing (around 6 breaths per minute) were particularly helpful for elderly individuals, women, and healthcare workers, who are often more prone to sleep disturbances. These practices also supported better mental relaxation and emotional balance.

**Conclusion:**
In conclusion, Pranayama stands out as a safe and effective method to manage sleep problems without the use of medication. It not only enhances sleep quality but also supports overall well-being. More research is encouraged to compare different breathing techniques and study their long-term benefits across various age groups and populations.

**Key words**: Pranayama, relaxation, sleep quality, yogic breathing.

**Introduction:**

Pranayama is an old Bhartiya (Indian) yoga breathing method that was created by ancient sages who were also yoga scientists at the time. They did this via careful observation and experimentation)Mondal, S. 2024).The respiratory system has a close connection to brain processes and can be influenced both voluntarily and involuntarily, they found.A variety of ancient yoga scriptures (Dharam granth) described the connection between pranayama)Mondal, S. 2024).

The scientific community has given particular attention to pranayama, or breath management, which is heavily stressed in yoga. Modifying the breathing rate, such as pacing or slowing it down, adjusting the nostrils, humming sounds, holding your breath, etc., is all part of breath regulation. Different breathing techniques from yoga that are detailed in the traditional *Hath yoga* literature are included)Saoji, et.al., .(2019)Pranayama, a method of controlled breathing, has demonstrated promise in reducing stress and enhancing mental health. The effects of Pranayama on healthcare professionals' reported stress, well-being, and quality of life are examined in this quasi-randomised clinical research, providing evidence for its use as a practical and efficient intervention in high-stress situations (Sarwal etal., 2024). Maharshi *Patanjali's Ashtanga* Yoga consists of eight branches:*Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyana*, and *Samadhi*. Each branch helps in improving human awareness in a special way. Yoga, especially *Pranayama*, offers many benefits for the body, mind, and spirit, and can help address problems caused by unhealthy lifestyle choices)Sharma, M. et al., 2009(.*Pranayama* is a key component of yoga philosophy and practice, and it is the foundation of all mind-body-focused exercises. It connects the two and acts as a bridge between the inner and outer selves. Pranayama appears in practically all yoga literature because it is such an essential component of yoga.)Tyagi, .(etal., 2023 Many *Hatha yoga texts*, like the *Hatha Pradipika* by Swami Svatmaram, the *Gherand Samhita* by *M*ahar*ishi Gherand*, and numerous others that date back more than 500 years, go into great length about it. The *Gherand Samhita* incorporates mantras with pranayama. Older writings such as the Yoga Upanishad, the *Shrimad Bhagavad Gita*, and the *Maharishi Patanjali Yoga Sutra*)Tyagi, .(etal., 2023

**Meaning and Definition Pranayam**

"तस्मिनसत्सत्श्वासप्रश्वासयोगतिच्चेदःन्यामः "

(तस्मिनसतिश्वासप्रश्वसयोर्गतिविच्छेदःप्राणा यामः.(P/Y2/49

Thus, *pranayama* is the control of prana's entrance and outflow. Retention of breath flowalso contains )Tyagi, .(etal., 2023

चलतेवातेचलंचित्तंनिश्चलेनिश्चलंभवेत्।

योगीस्थानुत्वम्आप्नोतिततोवायुंनिरोधयेत्।।

)Chale vate c halecittam nischale nischalambhavet)

(Yogi sthaṇutvam aapnoti tato vayum nirodhayet) ||2.2|| Hathapradipika

When the air moves, the mind also becomes restless and when the air becomes still, the mind also becomes steady and then the yogi attains stability)Tyagi, (et al., 2023.

| Sl. No. | Name of the Book | No. of Pranayama | Citation |
|---|---|---|---|
| **1.** | Hatha Yoga Pradipika (Svatmaram) | Ashta Kumbhaka (8) 2/44 | (Swami .S. B. (2003). |
| **2.** | Gherand Samhita<br><br>(Mahrishi Gherand) | Astha Kumbhaka (8) 5/46 | Sarswati, S. N. (2011). |
| **3.** | Hatha Ratnaavli(Shree Nivash Bhatt) | Astha Kumbhaka(8) Bhujangakarni navam 2/5,6 | Khichar, Sh.Satpal. (2018) |
| **4.** | Patanjali Yog Sutra | Pranayama (4). 2/49,50 | Swami .S. B. (2003). |
| **5.** | Yogakundalupanishad | Kumbhaka (2). 1/19-21 | Sharma Acharya et.al.,(2021) |

*Pranayama* is a combination of two words प्राण (breath) + आयाम(movement) = *Pranayama*, in *Pranayama*, the breath is controlled in three stages: "*Puraka*" (inhalation), "*Kumbhaka*" (holding), and "*Rechaka*" (exhalation))Sharma, etal., 2014; Onder, 201.(9 One can do *pranayama* in two different ways: fast and slow. Both slow and fast *pranayama* have benefits "Fast pranayama enhances reaction time, executive functions, and sensory-motor performance.")Sharma, etal., 2014; Onder, 201.(9One of Slow *pranayama*the special methods that incorporate each of those elements in a 2:1:2:1 sequence is "*Savitri Pranayam*,Pranava , anulom- vilom (Nadishodhana), Chandra Pranayama" Cortical and sub cortical activity are increased by slow breathing)Mondal, S. (2024).and Fast Pranayama have Bhastrika, .agnisar kriya(Kukkriya), KapalabhatiThe hold-in and hold-out phases last for just half as long as the inspiration and expiration phases doO)nder, 201.(9The liver, spleen, pancreas, and abdominal muscles are all stimulated and activated by Bhastrika and Kapalabhati. As a result, there is an overall feeling of excitement, sinus drainage, eye cooling, and improved digestion)Iyengar BKS .(2001 ,India's elderly population (60+) is expected to rise from 9% (104 million) in 2011 to 19.6% (330 million) by 2050, posing challenges in policymaking and healthcare. Over **50%** of older adults face sleep disorders, impacting hormone balance, muscle repair, energy conservation, and overall health, increasing concerns about physical frailty)Muhammad, T.,etal., .(2024Globally, women are disproportionately affected by sleep disorders due to hormonal and psychosocial factors, particularly during menopause, with insomnia affecting a significant proportion of this demographic**.** Everyday productivity and quality of life are negatively impacted by inadequate sleep. Between 50 and 70

million Americans currently experience sleep issues at some point in their lives (Castro, etal.,2024).In developed countries, the prevalence of Chronic fatigue syndrome )CFS( ranges between 0.2 and 1%, with approximately 2 million diagnosed cases in Europe and 2.5 million in the United State )US(, although a considerable number of individuals still remain undiagnosed)Fricke-Comellas,.(etal.,2024Pharmacological treatments for sleep difficulties can have negative side effects, especially in older people, with dependency, cognitive impairment and sleep disturbances being some of the negative consequences of these medications)Bankar et al.,2013).Sleep is a vital physiological need, essential for brain functions, organ health, the immune system, metabolism, and overall body functioning. It supports nerve conduction, affects the brain, heart, and lungs, and plays a crucial role in maintaining overall health and well-being)Tyagi, .(etal., 2023Thus, it's critical to find strategies that might enhance sleep, promote a higher standard of living in the near future, and potentially stop the emergence of comorbid illnesses in the long run(Castro, etal.,2024). Poor sleep and quality of life are also associated to the age, mainlyprimarily due to a depletion of body reserves and a compromised immune system.(Mooventhan & Nivethithan, 2017)

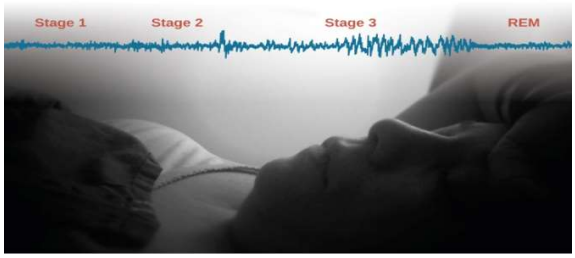
**Research Gap**

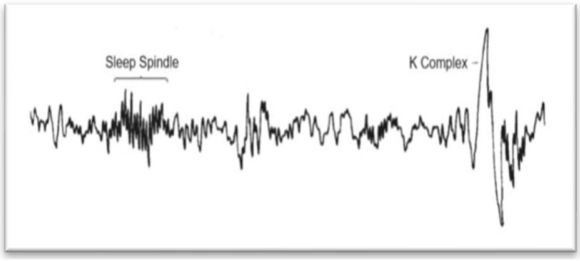
Many benefits of Pranayama are seen in research papers. And many studies have also been done to test the benefits of Pranayamas, but still there are very few research papers on all the different Pranayama. It has been seen in many research papers. Mostly the effect of Pranayama has been seen on the whole body. In most of the research, the effect of Pranayama has been seen on insomnia and diseases caused by sleep.Very few research papers have seen the effect of Pranayama on good sleep and improving sleep. Through the presented research, we are reviewing the research done on the special contribution of Pranayama to good sleep and how to improve sleep. So that such studies can be explored properly.

**Factors and Stages of Sleep**

Sleep is a vital physiological need, essential for brain functions, organ health, the immune system, metabolism, and overall body functioning. It supports nerve conduction, affects the brain, heart, and lungs, and plays a crucial role in maintaining overall health and well-being.)Tyagi, etal., .(2023Stress, anxiety, and sadness are among the psychological factors that are known to contribute to sleep disruptions (Chen et al., 2020). Sleep can be improved or disturbed by environmental factors such as noise levels, light exposure, and room temperature. Workplace stress, more screen time, and social obligations are examples of lifestyle and social factors that are becoming better acknowledged for their impact on sleep (Chen et al., 2020). Additional behavioral factors that affect sleep quality include imbalance food, lack of exercise, and irregular sleep schedules.Genetic and biological determinants, such as individual chronotype and family history, also play a role in shaping sleep patterns (Xie et al., 2021).Sleep is a vital physiological need, essential for brain functions, organ health, the immune system, metabolism, and overall body functioning. It supports nerve conduction, affects the brain, heart, and lungs, and plays a crucial role in maintaining overall health and well-being)Tyagi, etal., .(2023Numerous studies have demonstrated that sleep disturbances have an instantaneous detrimental impact on cardiovascular health, endocrine function, cognitive function, and performance. Additionally, it can raise a person's risk of obesity and other illnesses in both adults and

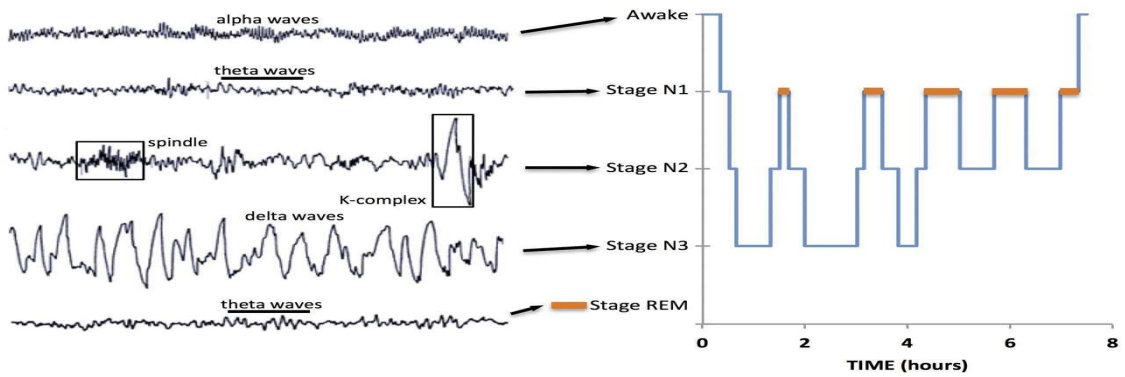
childrenO)nder, 201.(9Sleep is a reversible state where the body becomes disengaged from the environment, marked by reduced activity and closed eyes. It involves-K complex physiological and behavioral processes, with occasional unusual behaviors like sleepwalking or sleeptalking. Sleep disruptions may also intrude into wakefulness, causing phenomena like muscle weakness or dream imagery)Carskadon, M. A.,.(etal., 2005 The two primary stages of human sleep, REM (rapid eye movement) and NREM (on-REM), alternate during the night. K-complexes, slow delta waves (0.5–2 Hz), and sleep spindles (12–15 Hz) areamong the brain waves that indicate NREM sleep.



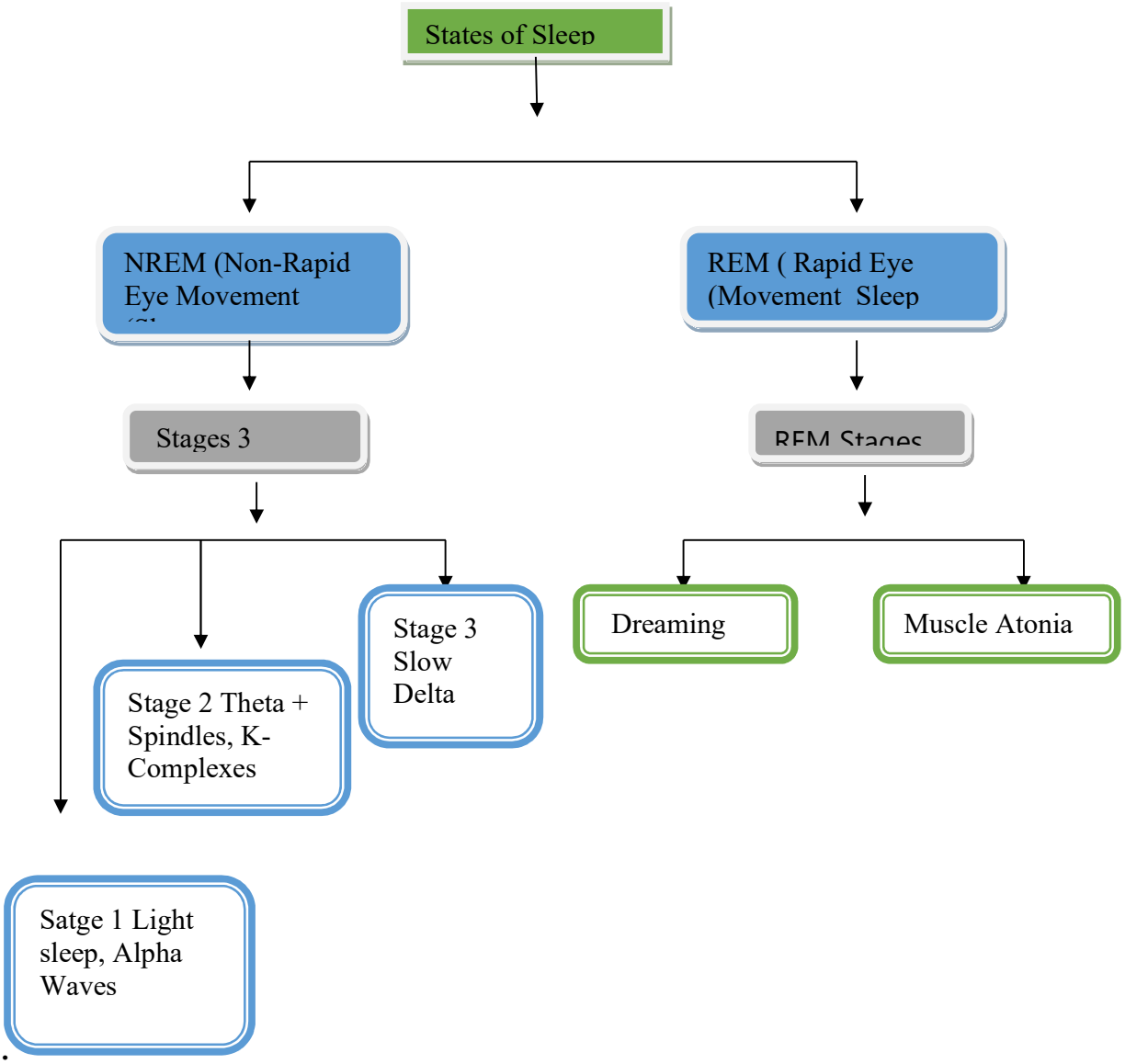




Low levels of mental and muscular activitytonic musclemuscle atonia ,are involved (Carskadon & Dement, 2005).In contrast, theta waves (4–7 Hz) and low-voltage rapid activity are present in desynchronized EEG patterns during REM sleep, along with muscular atonia and vivid dreams (Berry et al., 2014).NREM usually precedes the first REM episode, which happens 80–100 minutes after falling asleep, and then progresses through lighter to deeper stages (dominated by theta and delta waves, respectively). In 90-minute cycles, NREM and REM sleep then switch places (Kryger etal., 2017).

Carley, D. W.,et.al.,(2016)



**Stages of Sleep(Kryger et. al., 2017)**

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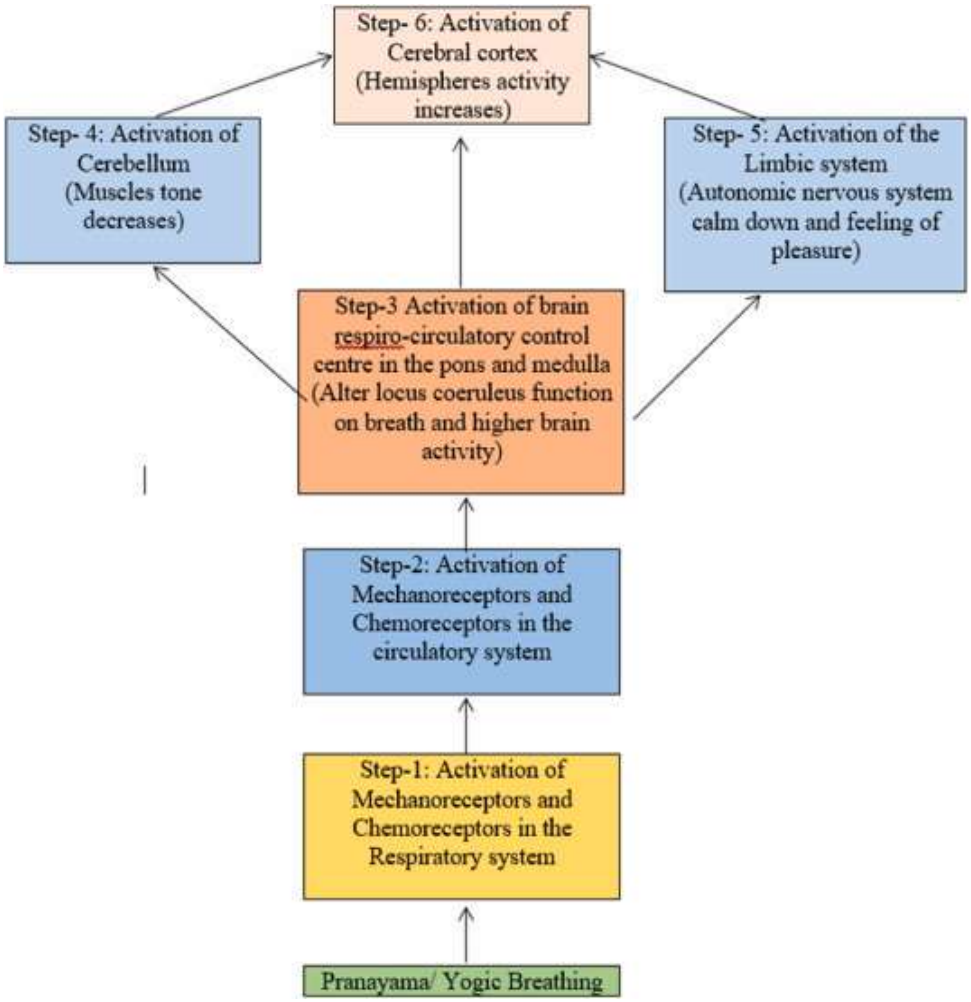
**Effect of Pranayam onRelaxation**

Modern medicine recognizes the importance of relaxation for a healthy lifestyle, but the problem is that, despite telling patients to relax, they don't explain how to do it, and it's possible that they don't know the answer for themselves.Anulom- Vilom, Yoga Nidra, Savitri Pranayama, Chandra Pranayama, Kaya Kriya, Marmanasthanam Kriya, and Shawasana have been shown to be very helpful for hypertensive patients)Bhavanani, A. B.2011(.Mind-body exercises consist of techniques like breathing, body relaxation, and self-awareness that are meant to ease physical tension and mental stress) Xu, M.,.(2023)Numerous web results that relate pranayama to these advantages demonstrate the widespread belief in Western culture that controlled breathing promotes well-being, relaxation, and stress alleviation, all of which improve health )Zaccaro, A.,etal.,2018).Effect of Pranayam on better Sleep

Examining a few earlier studies, we discovered that consistent *pranayama* practice has been demonstrated to greatly enhance the quality of sleep. It decreases tension, promotes relaxation, and improves sleep by activating the parasympathetic nervous system. Research shows that yoga, particularly pranayama, has a significant impact on mental and physical health. By promoting general well-being and healing, these techniques may aid in the management of psychosomatic and stress-related illnesses)Tyagi, P.,(et al., 2023 . Slow frequency breathing at a rate of 0.1 Hz (6 breaths per minute) for 20 minutes prior to bedtime reduces sleep start delay, the number of awakenings, and the duration of awakenings during sleep while increasing sleep efficiencyO)nder, 201.(9One of the most important components of yoga treatment for better sleep is *Pranayama*, or *B*reathes control techniques. Deep breathing techniques that facilitate better sleep include diaphragmatic and alternate nostril breathing. These techniques help soothe the nervous system, lower stress levels, and encourage relaxation) Mehta, V. (2024.(




The proposed physiological mechanisms of Pranayama (Yogic Breathing)(Mondal, S. (2024).

These include making sure the sleeping environment is peaceful and quiet, avoiding electronics and caffeine right before bed, and practicing meditation (National Centre for Chronic Disease Prevention and Health Promotion – Division of Population Health, 2022). Physiological changes that may affect one's health mark the irreversible process of ageing. The ageing population will cause a variety of health problems, such as sleep disturbances (Shree Ganesh et al., 2021).

**Research Methodology**

This review involved an in-depth analysis of research published between 2007 and 2024 to determine how pranayama, an ancient yogic breathing method, affects sleep quality and relaxation. We conducted an in-depth search of databases including PubMed, Google Scholar, Science Direct, and Scopus using terms such as “sleep quality”, “relaxation”, “stress management”, “yogic breathing”, “pranayama”, and “yoga and insomnia”. Research involving pranayama as a key intervention and its effect on sleep-related outcomes was limited to peer-reviewed research only. Systematic reviews, quasi-experimental designs, randomised controlled trials (RCTs), and experimental investigations were all taken into account. Participants included adults, the elderly, healthcare professionals, and people with stress or sleep problems. To assess sleep quality, duration, onset latency, night awakenings, and efficiency, critical assessment tools such as the Pittsburgh Sleep Quality Index (PSQI) and the Insomnia Severity Index (ISI) were used. Studies describing mental and physical effects, such as stress reduction and activation of the parasympathetic nervous system, were also taken into account. This systematic and targeted approach guarantees an accurate and scientific understanding of how pranayama can be a natural, non-pharmacological, and effective way to improve sleep and promote mental peace.

**Literature Review**

| S.No | Author(year | Title of the study | Study design/Participants | Intervention | Assesment | Result |
|---|---|---|---|---|---|---|
| .1 | Ho, E. CM. et.al.,(20 (18 | Effectiveness of sleep intervention developed by occupational therapists and a conceptual framework for sleep management | Narrative reviewNot / spacified | Reviewed sleep management interventions: assistive devices/equipment, activities, CBT-I, and lifestyle interventions | Evidence-based articles on occupational therapy interventions from 2007–2017 | Effective occupational sleep interventions. |
| .2 | Mei-Fen Tang, et.al., (2019) | Walking is more effective than yoga at reducing sleep disturbance in cancer patients: A systematic review and meta-analysis of randomized controlled trials | Systematic review and meta-analysis of RCTs1918/ | Moderate-intensity walking and yoga interventions for sleep disturbance in cancer patients | Pittsburgh Sleep Quality Index (PSQI) as the primary outcome measure | Walking improves sleep disturbances. |
| .3 | Wei-Li Wang, et.al.,(20 (20 | The effect of yoga on sleep quality and insomnia in women with sleep problems: a systematic review and meta-analysis | Systematic review and meta-analysis 1832/ | Yoga interventions compared to control conditions in randomized controlled trials | Sleep quality or insomnia severity accessed via subjective tools (PSQI, ISI) and objective tools (polysomnography, actigraphy) | Improved sleep quality significantly. |
| .4 | Shree Ganesh H.R., et.al., (2021) | Role of yoga therapy in improving digestive health and quality of sleep in an elderly population: A randomized controlled trial | Randomized controlled trial96/ | Yoga intervention (3 sessions/week for 3 months) compared to waitlisted control | Pittsburg Sleep Quality Index (PSQI) and Patient Assessment of Constipation QoL (PAC-QOL) | Yoga group showed significant improvement improve sleep quality |
| .5 | Jing-Yi Ai,et.al., (2022) | Effects of Multi-Component Exercise on Sleep Quality in Middle-Aged Adults | Randomized controlled trial24 / | Multi-component exercise (MCE) program: 90-minute sessions weekly for 12 weeks vs. control group | Pittsburgh Sleep Quality Index (PSQI) and physical fitness measures (strength, endurance, balance, flexibility) | Significant improvement |

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|---|---|---|---|---|---|---|
| | | | | maintaining daily routines | | |
| .6 | Tyagi, P.,et.al., (2023) | Effect of Pranayama as per Trishikhbrahmana Upanishad on Sleep Quality in Adults: An Experimental Study | Experimental, pretest–posttest control group30/ | Pranayama intervention (study group, n = 15) vs. no intervention (control group, n = 15) for 30 days | Pittsburgh Sleep Quality Index (PSQI) | Pranayama improves sleep quality. |
| .7 | Sarwal, R., et.al.,(20 (24 | Effect of pranayama on perceived stress, well-being and quality of life of frontline healthcare professionals on COVID-19 duty: A quasi-randomised clinical trial | Quasi-randomised clinical trial / 280 | 28-day pranayama regimen for intervention group (n = 123) vs. no intervention for control group (n = 127) | Perceived stress, WHO Quality of Life scores, psychological domain scores | Pranayama reduces stress, enhances well-being. |
| .8 | Prashanth, S.,et.al., (2024) | Effects of yoga on sleep quality among the geriatric population: Systematic review and meta-analysis | Systematic review and meta-analysis467/ | Yoga interventions from 5 studies on geriatric sleep quality | Sleep disturbance, duration, efficiency, PSQI-Global | Yoga improves elderly sleep quality. |

## Discussion

Some reviewed studies have concluded that pranayama, an ancient yogic breathing technique, is important in improving relaxation and sleep quality. According to research, pranayama may be a safe, natural alternative to traditional sleep aids, which often have adverse side effects (Banker et al., 2013). Pranayama is particularly beneficial for people with sleep problems because, according to Tyagi, it focuses on breathing control, which calms the nervous system, reduces stress, and improves emotional balance (Tyagi et al., 2023). According to a key finding of the evaluated research, slow breathing exercises such as Savitri Pranayama and Anulom-Vilom are useful in improving sleep. These techniques improve sleep efficiency, decrease sleep latency, and reduce nighttime awakenings when used at a pace of approximately 6 breaths per minute (Onder, 2019). This is particularly beneficial for high-stress groups who are more likely to have sleep problems, such as healthcare professionals, the elderly, and women undergoing hormonal changes (Castro et al., 2024; Muhammad et al., 2024). The physiological processes that underlie the benefits of pranayama are also important. By activating the parasympathetic nervous system, techniques such as bhastrika and kapalabhati counteract stress responses and encourage relaxation (Mandal, 2024). According to Tyagi et al. (2023), this is consistent with the ancient yogic concept that mindful breathing promotes mental and physical health, as stated by Zaccaro et al. (2018). Despite these encouraging results, the study points out research weaknesses. For example, most research focuses on how pranayama affects insomnia. Furthermore, little research has been done to compare different pranayama techniques and their long-term effects. Future studies could address these gaps by examining differences in the effectiveness of specific strategies across different age groups and communities. In summary, pranayama provides a safe, easily available, and effective way to improve relaxation and sleep without any prescribed medication. Incorporating it into daily activities may improve both physical and mental health, especially for those struggling with age-related sleep problems or who are exposed to high stress. Nevertheless, more research is needed to increase our understanding of its lasting benefits and ideal mechanisms (Sarwal et al., 2024). At this time, there is sufficient evidence to support pranayama as a useful technique for improving sleep quality and general health.

## Conclusion

To sum up, pranayama is an age-old Indian yogic breathing method that has a lot of potential to enhance general well-being by affecting both mental and physical health. Pranayama is an essential part of yoga practice, serving as a link between the mind and body. It has its roots in the teachings of Maharshi Patanjali and is well-documented in historical writings like the Hatha Pradipika and Gheranda Samhita. The efficiency of pranayama in lowering stress, increasing relaxation, and enhancing the quality of sleep is supported by scientific study. Numerous practices, including Anulom-Vilom, Bhastrika, Kapalabhati, and Savitri Pranayama, have been linked to heightened parasympathetic activation, which improves autonomic regulation and mental health in general. Regular practice of pranayama can help reduce sleep problems, which are becoming a rising global concern, especially among older persons and people who are in high-stress situations. According to studies, by encouraging relaxation and reducing physiological arousal, controlled breathing techniques improve sleep efficiency, minimise nighttime awakenings, and shorten the time it takes for people to fall asleep. With the increased frequency of sleep disorders and the potential side effects of pharmaceutical therapies, pranayama

appears to be a promising non-pharmacological intervention for improving sleep quality and overall health.There are still study gaps despite the overwhelming evidence of pranayama's advantages, especially when it comes to the relative efficacy of various breathing techniques. Future research should evaluate long-term adherence and efficacy in a variety of demographics while delving deeper into these variances. People can develop a comprehensive approach to health by incorporating pranayama into their daily wellness routines, which promotes both mental and physical vitality.

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