



Medical Applications of Sound Therapy: A Narrative Review of Its Efficacy in Treatment and Healing Modalities

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Abstract

Sound therapy is gaining attention in the medical world. The technique of mindfully employing sound and listening to alter and broaden consciousness in order to strengthen the body's innate ability to repair and rejuvenate itself is known as sound healing. Sound is a vibroacoustic waveform that can be used for both medical and therapeutic purposes. However, this has yet to be sufficiently utilized, and sound treatment in medicine is still mainly unexplored. This present narrative review attempts to shed light on the benefits of sound therapy in the alleviation of symptoms of various medical diseases. Sound therapy is a ground-breaking method of medical care and prevention that is revolutionising the field of medicine today. Sound therapy offers a non-invasive, easily accessible, and possibly inexpensive technique that might be incorporated into more comprehensive treatment regimens.

Introduction

Sound healing is a particular integrative medicine therapeutic approach that uses vibration. It is also known as sound therapy, sound bath, or sound meditation. Handmade bowls, which resemble bells, along with gongs and other vibrational musical instruments, are commonly used in sound therapy. Because of the unusual experience that participants have described as the sound and vibration "washing" over their bodies, it has really been dubbed a "sound bath". Sound healing is a less well-known vibrational healing method that has gained more attention recently. It can be thought of as a fusion of some elements of music therapy and meditation (Goldsby et al., 2022).

The majority of individuals would assume that music is only utilised for communication, celebration, ceremony, artistic expression, or amusement. Sound healing, a therapeutic approach that uses various signals and vibrations to enhance the mental and physical well-being of people, communities, and cultures, is another way that music is used. This can involve playing an instrument, chanting, dancing to the rhythms of alternative music, meditating, or listening to different musical experiences. One-on-one or in-group instruction may be a part of specific treatment from a specialised practitioner. Sessions typically entail sitting or lying down and listening to pre-made music or sounds that are played over a monitor. These sounds can be produced by specific instruments that have been used for millennia or by applying frequency and sound vibrations with the use of specialised instruments like a tuning fork (Pulido, 2001).

A vibration that travels through a solid, liquid, or gaseous media as an acoustic wave is called sound, and it is the feeling that is perceived by the unique sense and organ of hearing. The human ear can detect acoustic waves at frequencies between 20 Hz and 20 KHz. Ultrasound and infrasound waves fall above and below this frequency range, respectively (Uğraş, 2018). As a result, sound is an oscillation that travels through elastic medium like air as waves. It causes the media to vibrate, which causes changes in pressure, particle displacement, as well as velocity (Berg, 2012). However, the medium itself does not follow the sound wave. Compared to liquids or air, sound waves move more quickly through solids. The human ear interprets their stimulation of the hearing mechanism (organ of Corti) as sound. To put it simply, sound represents a sinusoidal plane wave that has amplitude, speed, direction, wavelength (the inverse of frequency), and frequency (waves per unit of time). The material used for transmission can reflect, refractively alter, or even attenuate sound waves. This depends on the medium's density, pressure, velocity, and viscosity (Abagnali, 2011).

Sound has amplitude and frequency, and it moves through a medium at a specific speed and in a specific direction. It creates vibrations in a substance by transmitting its waves into it. Each particle of the material has a unique frequency. They start to vibrate in time with the sound waves as soon as they come into contact with them. Sound therapists have believed since ancient times that the body's energy frequencies become out of sync when an illness strikes. These distorted frequencies can be aligned and returned to normal by pure sound generated by a variety of devices. It is believed that this will alleviate the illness and help to mitigate the issue. Numerous neuroimaging methods have demonstrated how music and sound can either stimulate or calm the brain, resulting in certain EEG brain wave alterations. On a deeper level, sound treatment can cause a sleepy phase in which the brain's theta waves are more prevalent. This improves memory, consciousness, and intuition while also promoting healing and clear, creative thinking. Neural regeneration processes are thought to be improved. It eases pain and stress and promotes relaxation. The effect lasts longer and is more profound (Shahid, 2021).

Through several vibrations, humans are continuously impacted and altering our rhythms. The alpha and theta brain waves linked to deep meditation, intense creativity, and healing-promoting sleep states can be triggered by these vibrations. Additionally, they lower our heart and breathing rates, which has a healing effect on both the body and the psyche. Brain waves that are synchronised enable the body to regain homeostasis and lessen any discord. The human body is a great vibration transmitter because it is a bioelectrical system, meaning that every cell is a sound resonator that can produce sound outside of itself.

It is our voices that possess a special healing potential. Each cell in the human body resonates when we sing. We all have the opportunity to tune into the Divine and relieve pain and illness without the use of drugs through sound healing. Sound healing is the therapeutic use of sound frequencies that stimulate the body/mind of individuals to put them into an optimal state of harmony and wellness. Every organism

vibrates at a different rate. There is a resonance frequency that is specific to each item in the cosmos. The vibration of sound is enjoyable to our body's cells. When two 'C' tuning forks are struck and put close to each other, resonance is easily visible. Simultaneously with the first tuning fork, the subsequent tuning fork will start to resonate. The second tuning fork has received some of the energy from the first one's sound wave. A metal or glass object will start to vibrate if the struck tuning fork's stem is put on it (Heather, 2007).

For anyone using music as a therapeutic aid, the understanding of the innate link between the microcosm and macrocosm is crucial. If the vibrations of an electron orbiting an atom and a planet orbiting the sun are indeed related, then we must undoubtedly acknowledge this similar relationship in ourselves. This vibration can be thought of and experienced as music if we believe that all matter is vibration. With this knowledge, the power of music to bring about revolutionary transformations for both individual and global healing becomes genuinely infinite.

Sound therapy has its roots in Egyptian, Babylonian, Indian, Chinese, African, Native American, and Persian cultures. For a number of advantageous reasons, sound has been utilised as a therapeutic technique by numerous traditional civilisations worldwide. The west has just started investigating these techniques as a substitute for treating illnesses and injuries that affect the body and mind. Few Westerners are aware of the power of sound. The ancient Hindu language of Sanskrit is where the word "tantra" first appeared. Tantra, which means "to weave together," is a philosophical concept that unites matter and spirit. Tattva and mantra are the two terms that make up the etymology of tantra. While mantra means "the word that saves," or "that which enables the heart and mind to connect and co-create," tattva means "that-ness" or "truth."

Tantric practice is seen in eastern Hindu and Tibetan Buddhist traditions as a means of harmonising and resonating with sound in a way that helps one to transcend the concept of dualism. Modern science is starting to recognise this connection through studies showing nonlocality, despite the fact that the Western civilisation has mostly ignored this old knowledge. Programs in linguistics have also demonstrated that sound can be a therapeutic medium. Similar to the application of the mantra, neuroscientists have discovered that precise and highly structured therapeutic inputs can be used to remodel the neural system. Many of the world's ancient spiritual teaching centres, from Tibet to Athens and other mystery schools, have realised that sound is the universe's primary creative force and that the world is constantly being recreated through the fusion of thoughts and sounds rather than just being created through sound (Barber, n.d).

For thousands of years, Hindus have utilised their understanding of mantras and ragas to alter their physical, mental, and emotional well-being. Since ancient times, shamans from various traditions have altered consciousness and performed healings through the use of drumming and chanting. Applying ideas like "resonance" and "entrainment" to these ideas and methods that have been successful for other civilisations and traditions, researchers have focussed on what is now known as Sound Therapy.

According to the Entrainment principle, two or more oscillators in the same field that are pulsing at a nearly identical rate have a tendency to lock in and start pulsating at the exact same rate. One source's strong rhythmic vibrations will force another source's weaker vibrations to lock into the first source's vibration. According to systems theory, "a system will conduct more energy if it has less diversity." A system's resonant frequencies will be less varied and a particular single energy frequency or multiple energy frequencies will be carried through the system more readily if there are fewer components in the system. Pulsing in collaboration requires less energy than in resistance. A study demonstrated how if you hang many grandfather clocks on a wall with pendulums swinging at various speeds, after a few hours all

of the pendulums will be swinging at the same speed. The most effective functional condition is what nature looks for. Harmonious bodily functioning can be restored by entrainment. We can adjust a body portion that is out of equilibrium. Some bodily functions are not in harmony with the entire organism when a person is unwell. A person who is ill or out of balance mentally or bio energetically can lock into a more potent healing sound if a strong, clear, harmonious sound is sung to them. A sound healing treatment uses both the entrainment and resonance principles (Bentov, 1988).

The process of sound healing is also based on the crucial idea of intention. Healing will happen if we sing a pure sound with an intention of healing to someone else. Everything in the cosmos is driven by intention, which is not something you create. According to Goldman (1992), "The human voice can produce almost any frequency, which falls within the audible frequency range, once we have mastered harmonic toning techniques. Healing is equal to frequency plus intention." Healing will take place if we can identify the ideal sound frequency and intention. Everything that exists in the entirety of the universe is tied to an inexplicable, unquantifiable power known to shamans as "intent." Everything in the cosmos was created by this unseen power. We may perform miracles whenever we are in connection with the source through which we all come. Aligning ourselves to this all-encompassing power is what intention is. Every action we take has a purpose, whether conscious or unconscious. In Sound Healing, the sound conveys our purpose to bring the patient's body, emotions, mind, and soul back into balance (Goldman, 2022).

According to Campbell (1997), there are several advantages to music with specific rhythmic elements. The brain wave pattern has been seen to shift from beta to alpha when listening to Pachelbel's Canon, which follows a rhythm of 64 beats per minute, which is the pace of a resting heartbeat. Music with a slower tempo causes us to breathe more slowly. Human heartbeats also have a tendency to sync with musical rhythms. Additionally, listening to rock music that is hard-driving has the opposite effect on heart rate than sluggish, easy-listening music. It has been observed that listening to relaxing music can help people believe that some workouts are easier and enable them to work out for longer.

The study by Goldsby et al., (2022) looked at how different mood variables and spiritual well-being variables interacted after sound healing treatment. For instance, for several age groups, there was a strong correlation between improved spiritual well-being and decreased anxiety and depression after therapy. Spirituality may help people with chronic mental illnesses, as well as people who are visiting a mental health professional and members of the general public, have better mental health. Therefore, this combination of enhanced mood and spiritual well-being may be significant for general wellbeing. Lower depression scores following sound therapy were linked to improvements in spiritual well-being for the 20–40 age group, and especially for the 31–40 age group. Many people in this age range are starting their jobs, maybe starting a family, and dealing with the stress, worry, and depression that come with these life transitions. Therefore, this can be a particularly crucial time in life to apply a straightforward therapeutic approach that could help enhance spiritual health and reduce depression without requiring a long learning curve. Furthermore, improvements in the age group 51–60's spiritual well-being scores showed a substantial correlation with improvements in stress and depression following sound healing. There is great promise for therapies like sound healing to support spiritual well-being and better mood because older and middle-aged people may be more susceptible to stress-related illnesses because of the potential for elevated cortisol levels.

We can start to see how music might enhance human understanding and relationships by reviving our perception of it as a collective force. By its very definition, communal music is a way for the participants to feel good regarding themselves and the people they are performing with. Human interactions can only be improved by using music as a restorative tool. Shared music can take many different forms, ranging from straightforward rhythms to intricate melodies. There could be just a few people or even a sizable crowd. However, the outcomes of group music can be exactly the same: the dismantling of obstacles that lead to social isolation. People have the chance to realise how they are interconnected with all of mankind on a level that may be not necessarily completely conscious. Therefore, this is one of the great strengths of music: We can start to realise that we are a network of interconnected beings whose goal is to work collectively as one, rather than isolated, individual units, through our communal music experience (Goldman, 1988).

Techniques of Sound Therapy

The technique of mindfully employing sound and listening to alter and broaden consciousness in order to strengthen the body's innate ability to repair and rejuvenate itself is known as sound healing. The nature and presentations of vibration and consciousness, as well as the impact of these interactions on energy, matter, and living things, provides the mechanisms of action that underlie the effectiveness of sound as a therapeutic or healing agent. Developing fundamental sound-making abilities through the use of various musical instruments and/or sound-making materials is a crucial component of sound healing practice. Easy-to-learn and operate instruments including tuning forks, handmade and crystal singing bowls, gongs, whistles, didgeridoos, flutes, frame drums, rain sticks, and the voice are frequently used by sound healers (Beaulieu & Perez-Martinez, 2018).

Handmade Bowls

For generations, monks in Tibet and Nepal used handmade bowls for healing and spiritual rituals. Singing bowl sound meditation is becoming a more common and accepted form of sound healing. This tradition is paralleled by the centuries-old use of instruments like bells, gongs, and a Tibetan bowl. These instruments' physics involves both wave and acoustic components. The study's authors tried using these bowls as part of a psychotherapy framework for adolescents at high risk to promote emotional recovery through deep breathing, visualization, and loving-kindness meditation. According to reports, this mix of therapeutic approaches may help clients in counseling sessions experience emotional and psychological recovery.

Standard tools for these therapies, like singing bowl therapy, are handmade singing bowls. These bronze metal tools, which are currently utilised for more medicinal purposes, have been employed for generations by Buddhist monks in sacred settings. Despite their non-instrumental appearance, no two of these bowls have an identical pitch. The sort of beater the practitioner employs and the reverberated sound from the device are determined by the thickness and size of these metal or glass bowls. Ancient shamanic practices demonstrate how the healer represented and diagnosed the patient's condition and spirit through music. Nowadays, music is used by therapists as a therapeutic tool, and the therapist acts as the conduit for the music.

A wooden mallet can be used to tap or rub these metal bowls, which resemble bells, to create a vibrating sound and effect. The bowl's vibration will respond with the body when utilised in therapy, essentially working with our circulatory systems, nerve centres, and

cells that communicate with different regions of the brain. In addition to laying the groundwork for a future, more formal control trial, medical researchers have investigated the potential impacts of using handmade singing bowls and sound healing on state of mind, stress, physical pain, and spiritual well-being. This method has also been found to be a viable stress-reduction strategy in the West in recent years. (Goldsby et al., 2017)

Determining the neurophysiological consequences of a handmade singing bowl massage was the goal of the study by Walter and Hinterberger (2022). 34 individuals in this prospective cohort investigation had their EEG, ECG, and breathing monitored prior to, during, and following a professional, handmade singing bowl massage. Subjective well-being changes were also evaluated. The effect sizes of various frequency bands were calculated in order to analyse the EEG data. A multiple comparisons-corrected two-tailed t-test was used to determine significant differences. Heart rate, respiration rate, and heart rate variability measures were calculated and contrasted. Following the intervention, the average heart rate was considerably lower and the breathing rate was higher. Participants reported feeling 76.5% more vitalised, 97.1% more balanced, and 91.2% more integrated. One way to understand the neurophysiological consequences of a homemade singing bowl sound massage is as a transition to a more contemplative, meditative frame of mind.

A similar research examined the EEG (electroencephalogram) of the listener in relation to the frequency band of the handmade singing bowl's sounds. The handmade singing bowl is used as a technique to preserve and restore the balance of the normal frequency range of the human body. The sound of the handmade singing bowl contains a variety of frequencies that can help the body heal or recover by restoring all of its natural frequencies. The band as a whole expended the most energy in the low frequency band of the singing bowl's sound, which was followed by a drop in energy in the mid-frequency and high-frequency bands. (Ahn, 2019).

Lastly, the purpose of a study by Kim and Choi (2023) was to confirm whether listening to the rhythmic sound produced by a handmade bowl caused brain waves to synchronise and activate. The experiment's handmade bowl degraded exponentially over the course of roughly 50 seconds, producing beats at a frequency of 6.68 Hz. Seventeen individuals (eight males and nine females, with an average age of 25.2) who listened to the sounds of a beating handmade bowl had their brain waves recorded for five minutes in the F3 and F4 regions. In contrast to other clinical brain wave frequency bands, the experimental results demonstrated that the beat frequency was where the increases in the spectral magnitudes of the brain waves were most pronounced. Given that the beat frequency is part of the theta wave area, which increases during a relaxed meditation state, the synchronised activation of brain waves at the frequency of the beating sound supports the idea that the handmade bowl sound may help people meditate and relax. The handmade singing bowl's sounds are intended to provide stability and comfort to people's minds and bodies overall since it is a tool for healing and recovery

Chakra Healing

According to some Eastern philosophies, such as Buddhism and Hinduism, the human body has energy centres called chakras. Seven main chakras are traditionally recognised, each of which has a distinct bodily, emotional, and spiritual function. It is thought that these energy centres affect a person's general health, vitality, and psychic ability. Achieving balance and harmony within oneself requires the alignment and activation of chakras, which are frequently connected to improved psychic powers and increased spiritual awareness (Verma & Srivastava, 2023).

Omkar vibrations originate directly from the sacred sound "Om," which is regarded as one of the most essential components in many spiritual traditions, especially Hinduism. This sound, which is thought to represent the primordial sound from which all creation originates, captures the essence of the universe. Chanting "Om" is believed to produce vibrations that resonate at the molecular level, impacting physical as well as mental states of being. It is said that this resonance helps these energy centres open and balance, improving spiritual awareness and general well-being. Furthermore, there is research that suggests heightened psychic skills may be associated with enhanced chakra activation, enabling practitioners to access extrasensory awareness and intuitive insights. A deep connection between the individual and the universe is made possible by these vibrations, which represent a special fusion of sound, energy, and consciousness. It is believed that Om's vibrational frequency resonates with and stimulates the chakras, promoting their alignment and activity. It is said that this synergy improves the body's energy flow, fostering spiritual development and holistic health (Maharara & Sabar, 2020).

People who want to use Omkar vibrations to heal their chakras can do so in a number of useful ways. In order to further activate the chakras, regular meditation techniques can include chanting or listening to recordings of Om. To produce sounds that resonate with particular frequencies linked to particular chakras, practitioners may employ particular musical instruments, such as harmoniums or singing bowls. By developing a regular practice that incorporates the vocalisation or auditory sensation of Om, people can improve their general spiritual practices and develop a stronger bond with their energy fields (Naragatti, 2024).

Bonny Method

Today, a number of sound healing techniques can support the preservation of harmony and well-being. The Bonny Method was created by American music therapist Helen Bonny and is also referred to as Guided Imagery and Music. She developed psychotherapy using this approach for patients who have experienced a variety of psychological and emotional challenges. This included people who had a history of abuse or addiction, were now dealing with anxiety or depression, were under stress at work, or had life-limiting illnesses like cancer. During a 30- to 45-minute classical music program, practitioners who employ the Bonny Method deal with a client who is in a calm state, lying on their back with their eyes closed. As this develops in reaction to the music, the client's imaging experience appears as an expression of his or her inner process. Therapists indicate that music can serve a variety of support purposes when it reflects the client's experience. In order for the client to "feel understood and held by the music," it might "match and produce an auditory reflection of the client's internal state" (Bonny, 1989).

A deep approach to music psychotherapy, the Bonny technique of Guided Imagery and Music (GIM) uses specially programmed classical music to create a dynamic unfolding of inward experiences. Through a steady, ongoing conversation with the unconscious, the music enables the ego to maintain its own sense of reality while letting the unconscious do the same. Throughout the session, the therapist engages the listener in active conversation to give grounding. Focussing and supporting the emergence of emotions, memories, bodily sensations, sensory images, and thoughts is the therapist's job. Together, music and the therapist encourage, reflect, and facilitate the creative process as co-therapists. GIM has become more well-known as a stand-alone option for psychotherapy as well as individual development (Goldberg, 2013). A series of Bonny Method GIM sessions may be therapeutically advised for adults seeking treatment for physical, mental,

and nonclinical requirements, and there is encouraging evidence that they can improve psychological and physiological health (McKinney & Honig, 2017).

In the Bonny Method of Guided Imagery and Music (BMGIM), the therapist's role was initially explained in 1978. The function is essentially the same, even though some components have changed and evolved. Several aspects of BMGIM therapy, involving assessment, goal-setting, music program selection, and fostering the therapeutic alliance, outline the therapist's role. New music instruction programs and adapting the conventional BMGIM format to the particular requirements of clients are examples of contemporary practice techniques (Grocke, 2005).

Medical Uses of Sound Therapy

Sound is a vibroacoustic waveform that can be used for both medical and therapeutic purposes. However, this has yet to be sufficiently utilized, and sound treatment in medicine is still mainly unexplored. Studies in this sector with tiny sample sizes are extremely rare. However, the results are encouraging.

Since traditional Eastern medicine views the patient more holistically, treatments target the entire self-system rather than just a malfunctioning physiological component. Similar to this, the ideas of energy medicine and vibrational medicine have grown in popularity in recent years and share this holistic view of the individual. Many of these methods are based on the ideas of the ancient East. Recent applications of the ideas can be described as innovative and progressive, such as the use of vibrational medicine in fields like psychosocial stress and regenerative medicine. With more people exhibiting a wide range of chronic stress symptoms, these strategies are desperately needed in today's culture (Beri, 2018).

An examination of research in the fields of noise, hospital noise pollution, and music medicine supports a recommendation for a means for lowering stress and anxiety in the hospital setting by integrating the issues of excessive noise in a hospital setting with the effectiveness of music therapy. Research has detailed the negative health impacts of noise, the issues with noise pollution in healthcare settings, and the advantages of substituting music for noise in order to lower blood pressure, heart rate, rate of breathing, emotional anxiety, and pain. Combining two research areas, the authors of the study suggest creating a department tasked with (1) reducing hospital noise and (2) offering music therapy to everyone present in the hospital, including staff, physicians, in-patients, and out-patients. This unifying source, or "Department of Sound," is proposed to help fully address and combine these two notions most effectively because of the high specificity of these domains (Cabrera & Lee, 2000).

Patients in intensive care units have a stressful environment, especially when they are on mechanical ventilation, which can cause anxiety. Anxiety can negatively impact the patient's overall health and recovery process. For critically ill patients, listening to music is a common and effective stress-relieving technique utilised in all fields of medicine. Without the need for medicine, it can reduce anxiety during mechanical ventilation, lessen the stress reaction, and promote a general relaxation response. More efficient breathing can emerge from this relaxation response's ability to reduce cardiac workload and oxygen use. Additionally, music can help patients sleep better and feel less

discomfort, which can lessen their exposure to sedatives and hasten the process of weaning off of a ventilator and their recovery (Mofredj, 2016).

Based primarily on sound levels, sound in hospital settings has historically been seen negatively as both unwelcome and intrusive. Sound volume is just one component of the soundscape. There is compelling evidence that examining the positive aspects of sound in a medical setting can make patients and nurses feel better. Studies on music psychology have also demonstrated that using music in healthcare settings might improve patients' feelings and healing processes. In this sense, hospital environments can help patients feel safe and at ease while also lowering tension and anxiety. The findings showed that not all sounds in healthcare soundscapes are unfavourable. When compared to quiet, listening to calming music has been demonstrated to lower blood pressure, tension, and post-operative trauma. Many of the sounds, such as the gentle breeze, the tweeting of birds, and the sounds of the ocean, provide valuable information that is beneficial to both patients and nurses. It has been shown that the perception of music can improve patient-reported outcomes, such as elevating feelings of happiness and lowering stress levels. Although music can be unpleasant and has both positive and negative sides to the hospital environment, it also has a calming effect that makes patients feel better (Iyendo, 2016).

Sound therapy is a ground-breaking method of medical care and prevention that is revolutionising the field of medicine today. The concept of resonance serves as the foundation for sound therapy. The electromagnetic fields that surround the body and all of its cells, organs, connective tissue, bones and liquids normally have a balanced vibratory frequency when everything is in homeostasis. Deep relaxation brought on by sound wave therapy promotes the healing of wounds and emotional distress. Sound therapy "cleanses" negative emotions, eases loneliness and despair, helps people let go of fear and misery, and offers helpful insights into emotional issues. It also aids in the relief of bodily ailments like surgical rehabilitation, mobility problems, muscular and connective tissue problems, and aches and pains (Kerna et al., 2022).

Anxiety

There is proof that sound vibrations have a significant effect on both the body and the psyche, resulting in less anxiety and improved wellness. The advantage is probably driven by relaxing. Compared to simple, supine relaxation, the handmade bowls, which are used for therapeutic purposes to improve the individual's mental and physical wellbeing, may promote deeper and faster relaxation. Based on the objective evaluation of physiological parameters, such as the Stress Index and Heart Rate Variability (HRV), the study by Trivedi and Saboo (2019) sought to confirm the hypothesis that brief 20-minute relaxation sessions with the aid of handmade bowls could offer greater depth of relaxation than Supine Silence (SS). For 16 subjects, seven metal handcrafted singing bowls were utilised in a certain order. There were 17 participants in the Supine Silence group. The Emwave Pro gadget measured heart rate variability (HRV) data, and Kubios HRV Premium application was used for analysis. Key HRV parameters were compared both within and between the groups in the analysis. Overall, both groups experienced relaxation as indicated by changes in HRV values, which was to be expected. Further investigation, however, revealed that the group using handmade singing bowls experienced more consistent relaxation, as seen by a statistically significant decrease in stress index and a spike in HRV. Throughout the exercise, they were able to attain a deeper level of relaxation at more regular intervals of five minutes than the Supine Silence group. According to the study, singing bowl sessions can be used as a tool to induce an effective relaxation

response (with a greater parasympathetic tone, decreased stress) in just 20 minutes, which can lead to considerable health benefits and aid in healing and energy recovery.

The goal of the study by Gurvendra et al. (n.d) was to examine how sound therapy affected women's elevated levels of stress and anxiety. A quantitative method of investigation was used as the study's research methodology. A "pre-post experimental group design" was used for the study. Twenty women around the ages of 25 and 45 were chosen for the study using the non-probability quota selection approach from Dev Sanskrit Vishwavidyalaya in Haridwar. Stress, anxiety, and two anxiety-related metrics, alpha-electroencephalogram (EEG) and GSR, were examined to determine Sound therapy's effectiveness as a low-cost treatment method. Anxiety was measured using Sinha's comprehensive anxiety test. To confirm the findings, galvanic skin resistance (GSR) as well as alpha EEG (electroencephalogram) neural activity were also examined. The student t-test was used to evaluate the data. Results were shown to be clinically significant at .01 levels. This suggests that the brain changes during meditation from an alert, energetic state (beta) to a calmer, more relaxed state (alpha and theta). The main goal of this is to increase the brain's and other internal organs' capacity so that people can use their abilities to their fullest potential and maintain both physical and mental health (peace, contentment, bliss, and self-realization). As a treatment method for stress and anxiety, sound therapy can be quite successful.

Similarly, this study by Jain et al., (2023) investigated the viability and efficacy of a biofield-based, virtually administered sound healing therapy to lessen anxiety in people who fit the criteria for generalised anxiety disorder. During the SARS-CoV-2 pandemic, this one-group, mixed-method feasibility research was carried out virtually via Zoom. According to the Generalised Anxiety Disorder, 15 participants had moderate to severe symptoms of anxiety. Statistically significant decreases in anxiety (State-Trait Anxiety Inventory), negative affect (Positive and Negative Affect Scale), as well as perceived stress (Perceived Stress Scale) were seen in intention to treat analyses ($p < .001$ in all cases). Over the duration of the intervention, participants' use of negative affect words significantly decreased linearly ($p = .01$), according to linguistic as well as word count analysis. The results show that virtual bio-field tuning is viable and feasible for research, and that it may have a significant effect on lowering anxiety and enhancing mental health.

PTSD

Post-traumatic Stress Disorder (PTSD) is a common sequelae of severe combat-related emotional trauma that is often associated with significantly reduced quality of life in afflicted veterans (Pezzin et al., 2018). Playing or listening to music can improve brain recovery, normalise the stress response, and promote neurogenesis and neuroplasticity. Furthermore, research demonstrates that music can help with coping and emotional control, dissociation symptoms, anxiety and despair, and the general intensity of PTSD symptoms. A growing number of ICU survivors along with their loved ones around the world suffer from PTSD, which is a component of post-ICU syndrome and affects their quality of life and ability to function. There hasn't been much advancement in the treatment of PTSD during intensive care unit stays. In order to impede the appropriate regulation of the fear response, PTSD symptoms are exacerbated by a hypoactive prefrontal cortex, an increased amygdalic response, hippocampal atrophy, and a disrupted HPA axis feedback circle. The hippocampus and amygdalae, which are adversely affected by stress, can be stimulated by music. Additionally, music can promote neuroplasticity and neurogenesis in certain brain

regions, facilitating brain healing. Furthermore, music can promote communication between the Prefrontal cortex/hippocampus and amygdalae, which is essential for controlling stress reactions (Pant et al., 2022).

Soldiers frequently experience combat stress reactions, which can lead to post-traumatic stress disorder (PTSD). Symptoms of this upsetting illness include generalised emotions of powerlessness, intrusive memories, angry outbursts, and feelings of loneliness and social isolation. In music therapy, drumming has drawn a lot of interest. Six soldiers with PTSD connected to combat or terror are included in the study's music therapy group work. A self-report, open-ended in-depth interviews, and digital cameras that recorded the sessions were used to gather data. Following drumming, there was a noticeable decrease in PTSD symptoms, particularly an increase in feelings of openness, community, belonging, sharing, closeness, connectedness, and intimacy; a non-threatening access to traumatic memories; an outlet for anger; and a return to self-control (Bensimon, 2008).

Cognitive behavioural therapy (CBT) is not always effective for treating PTSD in patients. According to published research, group music therapy may help cure PTSD. An exploratory randomised controlled trial, a qualitative content analysis of therapy, and patient interviews were among the mixed approaches used in the study. After completing CBT, patients with substantial PTSD symptoms ($n = 17$) were randomised to either the treatment group ($n = 9$) or the control group ($n = 8$). Exit interviews were performed following ten weeks of group music therapy for the treatment group. At the conclusion of the trial, the intervention was made available to the patients in the control group. At the start and finish of treatment, symptoms were measured using the Beck Depression Inventory II and the Impact of Events Scale-Revised. At 10 weeks from baseline, treatment-group participants showed a marginally significant decrease in depression and a substantial reduction in the severity of PTSD symptoms as compared to the control group. According to their experiences, patients thought music therapy was beneficial, which is consistent with recent research. For PTSD patients who have not reacted well to cognitive behavioural treatment, group music therapy seems to be both possible and beneficial (Carr et al, 2012).

Problems in sound tolerance

The most prevalent of the various kinds of sound tolerance problems is hyperacusis. It is described as bodily pain or discomfort that occurs when a sound reaches a volume that is pleasant for the majority of individuals. Enhancement of auditory gain is a strong candidate for that mechanism. The idea that altering exposure to sound can alter auditory gain is supported by a lot of data ((Pienkowski, 2019). The opposite of adding sound (sound enhancement) is reducing sound (sound deprivation). Sound therapy is based on adding sound (Formby et al., 2007). A methodical approach is necessary when using sound therapy for hyperacusis, starting at a very low volume and progressively raising it in an effort to reach a "normal" level of loudness tolerance (Henry, 2022).

The aetiology of idiopathic sudden sensorineural hearing loss is uncertain. Between 50 and 75 percent of individuals heal on their own. The current investigation in patients with acute deafness treated with sound therapy is supported by scientific experiments conducted on animals. Patients who suffered from idiopathic acute sensorineural hearing loss between 2003 and 2009 were given steroids, piracetam, and antioxidants in addition to sound therapy. When comparing the outcomes of patients treated with medicine ($n = 65$) to those treated with medications and sound therapy ($n = 67$), it was shown that the latter group recovered more quickly. Of the patients who received medications and sound therapy, 25 (37%) recovered completely, 28 (42%) recovered well, 11 (16%) recovered somewhat, and 3 (5%) recovered poorly

or not at all. 54% of patients in the medication-treated group and 79% of patients in the medication and sound therapy-treated group regained more than half of their audition. At least a year following treatment, there were no changes in auditory recovery (López-González, 2012).

A common and sometimes incapacitating medical symptom is tinnitus. Depression, head injuries, ototoxic medications, and hearing loss are risk factors (Baguley et al., 2013). There is no one "absolute" way to treat tinnitus using a single therapy methodology. The goal of this study is to determine how Bhramari Pranayama Sound Therapy affects tinnitus's emotional and physical components. Bhramari Pranayama is a "Yogic" method that combines a calming pose with the simultaneous pressing of the eyelids that are shut and the production of a humming sound at the sub-tinnitus level during exhale. BP was used as a treatment for a subset of tinnitus patients. Ginkgo biloba, masking therapy, and an amalgamation of all the aforementioned methods were administered to three further groups of comparable individuals in order to treat their tinnitus. Analysing the values obtained before and after therapy for characteristics like 1) Loudness; 2) THI score; and 3) the depression and anxiety scale; allowed for the determination of the study's outcome. Results showed that Bhramari Pranayama and every other treatment modality significantly decreased post-therapeutic ratings across all groups and all metrics. According to the study's findings, Bhramari Pranayama considerably decreased the tinnitus-related irritation, despair, and anxiety. It may have alleviated tinnitus symptoms by 1) producing self-generated sound, 2) causing parasympathetic dominance in the brain environment, and 3) serving as a relaxation method. Bhramari Pranayama may be a useful and affordable adjuvant treatment for tinnitus, likely working on the basis of neuromodulatory principles (Pandey et al., 2010).

Cancer

Patients experience anxiety after receiving a cancer diagnosis, which can have serious psychological repercussions. The purpose of the study by Ziaeirad et al. (2023) was to ascertain how sound therapy affected the felt stress of patients with cancer receiving chemotherapy. In 2018, 70 cancer patients receiving chemotherapy at Dr. Ali Shariati Hospital in Fasa participated in the clinical trial study. The convenience technique was used for sampling, and the samples were split into two groups at random: the control group and the test group. The Holy Quran was recited, traditional music was played, or heavenly petitions were said for the intervention group. Results showed that the control group patients' mean stress scores prior to and following the intervention did not differ significantly ($p < 0.05$). However, following the intervention, the test group patients' mean stress levels considerably dropped ($p < 0.001$). Additionally, patients in the test group experienced lower mean stress scores than those in the control group following the intervention ($p < 0.001$). According to the current study's findings, sound therapy helped patients feel less stressed. Therefore, the treatment team can readily adopt this simple and non-invasive way to assist cancer patients feel less stressed.

Chemotherapy is considered the most severe type of cancer treatment; yet, music can be a helpful distraction during chemotherapy. In sound therapy, monochord (MC) tones are used to promote relaxation, improve body perception, and reduce pain. In contrast to progressive muscle relaxation (PMR), a well-known relaxation technique, this study by Lee et al. (2012) examined the calming effects of monochord tones on patients undergoing chemotherapy. Throughout chemotherapy, two randomly assigned patient groups were monitored. Twenty people in one group were exposed to a taped monochord sound therapy, and another twenty people in the second group heard to recorded PMR. Spielberger's State Anxiety Inventory (SAI) was used to examine each session both before and after. Additionally, multivariate

electroencephalogram (EEG) data were obtained for the first and last sessions. Patients' psychological, physical, and anxiety levels significantly improved in both the PMR and sound treatment groups. According to the EEG data, during the final period of relaxation treatment, the monochord and PMR groups were linked to a drop in midfrontal beta-2 band (20–29.5 Hz) activity and an increase in posterior theta (3.5–7.5 Hz). Additionally, compared to the PMR group, the sound therapy monochord cohort showed lower alpha band (8–12 Hz) activity. With largely overlapping but noticeably different neurological correlates, this study demonstrates that both practicing PMR and listening to recorded monochord sound therapy sounds have a beneficial and significant effect on gynaecologic oncological patients undergoing chemotherapy.

Even after receiving cancer treatment, cancer patients still have high levels of emotional anguish. High levels of emotional discomfort impair endocrine and immunological systems and lower quality of life. This study by Burns (2001) investigated the efficacy of guided imagery and music therapy in reducing mood disorders and enhancing cancer patients' quality of life. A wait-list controlled group and an experimental group were randomly allocated to eight participants with a history of cancer. Each experimental subject took part in ten weekly Music therapy and Guided Imagery sessions. Every participant filled out the Quality of Life—Cancer (QOL-CA) and Profile of Mood States (POMS) questionnaires before, during, and after a 6-week follow-up. At the posttest, participants in the Music Therapy and Guided Imagery sessions outperformed those in the control group in terms of mood and quality of life. Furthermore, even after sessions ended, the experimental group's state of mind and quality of life ratings kept getting better. The findings show that guided imagery and music therapy were successful in raising these cancer patients' moods and quality of life.

Cardiovascular diseases

In order to restore and maintain optimum health, cardiac rehabilitation combines physical, psychological, and occupational techniques. In an outpatient setting at two major metropolitan teaching hospitals, a novel study by Short et al. (2013) that included sound and music therapy (Bonny Method of Guided Imagery and Music [BMGIM]) examined the experiences of cardiac rehabilitation participants. Six trial participants were enlisted for six weekly music and sound therapeutic sessions starting six to fifteen weeks following cardiothoracic surgery. Patients utilised music therapy to spontaneously investigate their healing process, according to a qualitative analysis of the patient's narrative conducted within a semiotic framework. Themes included anticipated lifestyle, post-operative adjustment, and physical changes. This study shows that individuals undergoing cardiothoracic surgery may benefit from music therapy to better comprehend their internal healing process.

The purpose of the study by Abd-Elshafy et al. (2015) was to assess how music therapy affected the stress levels of kids having congenital heart disease repair. The sample consisted of fifty children between the ages of 4 and 12 who were having congenital heart disease rectified. Patients were randomly assigned to one of two equal groups; in the music group, they listened to a recorded CD of songs and music that the child liked, while in the control group, they listened to a blank CD. Preoperative vital signs, clinical data, and demographic information were all documented. Blood samples were taken for baseline stress indicators, such as cortisol and glucose levels. Patients were evaluated intraoperatively for stress markers and vital signs prior to extubation, and for pain and sedative scales following extubation. In order to measure post-traumatic stress disorder and adverse postoperative behaviour changes, an interview was done with the patients and

their parents during the first week following surgery. Preoperative and at-extubation blood glucose levels and preoperative blood cortisol levels, clinical data, vital signs, and demographic variables did not significantly differ between groups. Blood glucose and cortisol levels during all intraoperative times showed significant variations between groups, but only at extubation did cortisol blood levels show significant differences. Pain and sedation scores, the prevalence of post-traumatic stress disorder in children, and the incidence of poor postoperative behaviour all showed significant variations. Children getting treatment for congenital heart defects reported feeling less stressed and more relaxed when they listened to music that was beneficial to them.

Another study that assessed the impact of music therapy in enhancing the health-related outcomes of patients undergoing cardiac rehabilitation was conducted by Mandel et al. (2007). In an outpatient cardiac rehabilitation program in Ohio, the study was carried out using a randomised, controlled trial with follow-up. Of the 103 patients who were recruited, sixty-eight of them, ranging in age from 30 to 80, finished the program. Both psychological and physiological effects were quantified. Patients undergoing cardiac rehabilitation were randomised to either music therapy in addition to cardiac rehabilitation or cardiac rehabilitation alone. Music-Assisted Relaxation and Imagery, counselling, and musical experiences were all included in music therapy. Anxiety, general health, and social functioning changes were interpreted four months after treatment, including improvements from before to after music therapy sessions. Results indicate that, in addition to cardiac rehabilitation, music therapy involvement may have a positive impact on certain health-related outcomes.

Sleep

Doctors and other healthcare professionals are becoming increasingly interested in the topic of sleep. Because chronic sleep deprivation is so often linked to other physical and mental disorders, speciality clinics are increasingly looking at sleep-related difficulties. Sleep quality may or may not be enhanced by music alone. There is a greater chance that music will improve sleep quality if it is carefully chosen and incorporated into a routine that has been advised by music therapists. An informed foundation will be provided in this way by clinical decision-making, music analysis, and integrative practice concerns. The notion that cultural significance can be customised and accommodated within music interventions is accompanied by familiar music that is chosen by the patient. It is simple to address the comfort of patients by implementing such adjustments to fit patient needs. An essential part of evaluating a patient's sleep is determining if the trauma was caused by an illness or by anxiety.

The American Academy of Paediatrics warned about the possible dangers of pharmaceutical sedation for infants and young children almost twenty years ago. In order to help sedate children to undergo medical testing, researchers subsequently established a formal music therapy procedure that included culturally chosen, recommended "songs of kin" that parents and/or music therapists might sing in a therapeutically modified manner. This study led to the development of a music sedation procedure that has been used ever since for patients who need to be sedated for medical tests. It has also been used to help patients who are experiencing anxiety-related sleep loss (Loewy et al., 2005). The clinical trial's most crucially clinically suggested component was the use of elements of the music itself, including melodies that the parents and kids were accustomed to ("song of kin"). A follow-up clinical research that involved 272 infants in 11 NICUs in the US likewise implemented the sedation and "song of kin" procedure. In order to highlight the parents' voices and create favourable conditions for

entrainment, the melodies were purposefully used with meter adjustments, lullaby formats, and frequently the elimination of words. The sound therapy “song of kin” treatment was demonstrated to be beneficial whether provided by a parent or by a music therapist (Loewy, 2020).

Music	Goal	Music Therapy Technique
Step 1: Orienting Song/Music of Kin	Orienting & Grounding. Music or song may provide familiarity and safety.	Invite music or a song of kin. Learn to play selected song choice with or for the patient.
Step 2: Musical Holding	Music phrasing shifts to provide a further holding place for the experience. Tension release.	Gradually shift the song/music to 3/4 or 6/8 holding meter. Remove lyrics.
Step 3: ‘Cadencial Effect’	Enhance a feeling of safety and stability. The music follows the patient’s breathing patterns.	Use a selected cadence-with mantra (simplified patient-selected words/lyrics) within a simple V-I harmonic hold. Sing/play rubato style; meterless, repeating the phrase entrained to the patient’s release of air, fading in and out of the cadence.
Step 4: Elongated Pause	Sustained silences, or rests, hold a feeling of embellished pause.	As the sense of meter loosens, elongate periods of grand pauses that occur between exhalations, remove harmonic support.
Step 5: Breath Entrainment	Simple breath tones, provide the barest, yet most aligned breath support, inducing sleep response	Use breathed voice on one tonic tone-vowel or phoneme—release the sound intricately attuned to the patient’s exhale—observe shifts in consciousness.

Figure 1: Music sedation protocol (Loewy, 2009)

Conclusion

This narrative review emphasises the potential benefits of sound therapy in reducing the symptoms of a number of illnesses, such as cancer, heart disease, anxiety, tinnitus, and sleep disturbances. The overall efficacy of sound therapy is still up for debate because of variations in study design, treatment methods, and outcome measures, despite mounting evidence of its potential therapeutic advantages.

Deep relaxation brought on by sound wave therapy promotes the healing of wounds and emotional distress. Sound therapy "cleanses" negative emotions, eases loneliness and despair, helps people let go of fear and misery, and offers helpful insights into emotional

issues. It also aids in the relief of bodily ailments like surgical rehabilitation, mobility problems, muscular and connective tissue problems, and aches and pains

Sound therapy, namely through treatments like music, white noise, and natural sounds, has demonstrated promise in lowering symptoms, enhancing relaxation, and fostering higher-quality sleep for problems like anxiety and sleep disorders. Similarly, sound therapy has been investigated as an adjuvant strategy for controlling cardiovascular disease and cancer-related symptoms, such as pain and mental distress, and has shown some efficacy in reducing the suffering associated with tinnitus.

The parasympathetic nerve system, which controls the body's "rest and digest" reaction, has been shown to be activated by sound therapy, especially when it involves relaxing music, nature sounds, or binaural beats. This lowers cortisol levels, blood pressure, heart rate, and other physiological indicators of stress. As a type of sound therapy, music therapy has been utilised extensively to help people with depression feel better. Dopamine, a neurotransmitter associated with emotions of reward and pleasure, can be released in response to upbeat, happy music. It can also assist people in safely and responsibly processing and expressing their feelings.

Meditation and mindfulness techniques, which are frequently used to treat depression, stress, and anxiety, can incorporate sound therapy. Chanting or Homemade singing bowls are examples of soundscapes that can help people focus, calm their minds, and enter a meditative state. These techniques have been demonstrated to boost mood, increase emotional resilience, and lessen rumination—a behaviour frequently linked to anxiety and depression.

Through several vibrations, humans are continuously impacted and altering our rhythms. Brain waves that are synchronised enable the body to regain homeostasis and lessen any discord. The human body is a great vibration transmitter because it is a bioelectrical system, meaning that every cell is a sound resonator that can produce sound outside of itself. We can start to see how music might enhance human understanding and relationships by reviving our perception of it as a collective force. By its very definition, communal music is a way for the participants to feel good regarding themselves and the people they are performing with. Human interactions can only be improved by using music as a restorative tool.

Sound therapy offers a non-invasive, easily accessible, and possibly inexpensive technique that might be incorporated into more comprehensive treatment regimens. To further comprehend its role in the clinical setting for symptom management across these various medical diseases, future research should concentrate on clarifying the basic principles of sound therapy, standardising treatment methods, and examining long-term effects.

Limitations

This narrative review highlights the potential benefits of sound therapy across various medical conditions, but several limitations must be considered. Publication bias may affect the findings, as studies with favorable outcomes are more likely to be published, potentially skewing the effectiveness of sound therapy. Additionally, the review primarily focused on specific disorders, potentially overlooking other areas where sound therapy could be beneficial.

Most of the included studies were observational and lacked randomization or control groups, making it difficult to establish causality or assess the true impact of sound therapy. The absence of long-term follow-up also limits the ability to evaluate the sustainability and potential risks of sound therapy.

The diversity in patient demographics and conditions further restricts the generalizability of the findings, as individual characteristics may influence outcomes. Additionally, symptom relief is subjective, with patients' perceived benefits potentially affected by placebo effects and personal expectations.

These limitations underscore the need for more rigorous, large-scale studies with standardized protocols and long-term follow-up to fully understand the role of sound therapy in treating various medical conditions.

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