

Management of Chronic Illness through Music Therapy: A Review

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Abstract

Chronic illnesses result in several undesirable physiological and psychological outcomes in patients which are seldom addressed in clinical settings. The transition from the biomedical model to the biopsychosocial model has led to the development of novel interventions for chronic illness management. Music therapy is a non-pharmacological intervention used to address patient needs in the aftermath of treatment. This review highlights the application of music therapy across chronic illnesses. Both, active and receptive music therapy have shown positive results across chronic illnesses; on physiological, physical and psychological parameters. The efficacy of music therapy interventions is enhanced when used in combination with other non-pharmacological interventions. However, contradictory results have also emerged and there is an urgent need to execute well-designed randomized studies with an adequate sample size to arrive at a definite conclusion.

Keywords: music therapy, chronic illness, Indian classical music, noncommunicable disease

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Chronic illnesses or non-communicable diseases (NCDs) account for the main cause of death globally. According to estimates by the World Health Organization, approximately 71% (41 million) deaths occur due to NCDs globally each year (WHO, 2018). In India alone, 5.8 million people die annually as a result of a non-communicable disease. As stated by Patel et al. (2011), non-communicable diseases will give rise to almost three quarters of total deaths in India by the 2030s. Cardiovascular diseases, diabetes, cancers and respiratory illnesses constitute 80% of all premature NCD deaths (WHO, 2018). This gruesome statistic is hard hitting as most NCDs are manageable through simple lifestyle changes (Bennett et al., 2010).

The term 'chronic illness' is often used interchangeably with the term 'chronic disease' (Martin, 2007). Chronic disease is defined based upon the physical health status of the individual requiring medical attention; chronic illness refers to the subjective experience of the human living with the condition. This distinction is very important as it highlights the need for a holistic health management approach.

Any chronic condition cannot be managed only through a pathophysiological approach, but rather requires a management plan that is moderated through cognitive, emotional and interpersonal factors (Larsen & Lubkin, 2009). Medical, surgical and pharmacological treatments can only work to an extent and require the provision of continuous care and treatment in order to manage them. The psychological dimensions of chronic illnesses are often left unnoticed when medical care is considered (Turner & Kelley, 2000). Contemporary research is making efforts to address the psychological needs of individuals with chronic illnesses and has revealed that music is a powerful stimulator of socioemotional processes, thus, positively affecting emotional states and resulting in profitable health outcomes (Dileo & Bradt, 2009; Koelsch et al., 2006).

It is a hard fact that there is no absolute cure for chronic health diseases although several treatment approaches can effectively aid management and keep the deterioration in check. The inclusion of non pharmacological options along with pharmacological based treatment has taken advent, especially with the acceptance of the transitional shift from the biomedical model to the biopsychosocial model of health (Lehman et al., 2017). Physical exercise, biofeedback, neurofeedback, cognitive behavioural therapy, lifestyle modification, guided imagery, mindfulness-based stress reduction, movement therapy, behavioural activation and bright-light therapy are some examples of non-pharmacological interventions used in the management of various chronic illnesses (Goodill, 2018; Bozcuk et al., 2017; Blaskovits et al., 2017; Holvast et al., 2017; Oza & Garcellano, 2015; Chang et al., 2015; Ambrose & Golightly, 2015). Music Therapy is one such non-pharmacological intervention that has also been used in the management of chronic illnesses (Pothoulaki et al., 2012).

The Connection of Music and the Human Body

The connection between music and the human body dates back to the 5th century BCE when Greek philosophers used music as a medium to stimulate emotions and bring a sensation of relaxation to the body. The Greek philosopher Plato was of the opinion that different forms of music had various health benefits on an individual's body (Grocke & Wigram, 2007). The use of music has been prevalent in traditional Indian healing systems since ancient times. Certain Indian rituals that are practiced even now make use of musical sounds in order to alter states of consciousness and reduce pain perception. For example, *Thimithi*, a fire-walking festival originating in Tamil Nadu, India; requires devotees to walk on red hot fire made of coal. Another Indian festival – *Thaipusam* – requires devotees to pierce silver or steel pins and skewers in different sizes all over the body through the skin, back, cheeks and tongue. This ritual signifies that all human desires and evils are destroyed by the pins and the mind is

purified. Surprisingly, the devotees do not feel any sensation of pain in their bodies while doing this. These rituals are preceded by the loud beats of drums and shouts with religious fervor “*arohara*” and religious songs to take the devotees to an altered state of consciousness. It is this auditory environment that changes the state of consciousness in the devotees and eliminates the sensation of pain (Sundar, 2007).

India has a rich representation of various kinds of classical music. Contemporary music therapy practice in India makes use of Vedic verses (*archika*, *gathika* and *samika* verses) to improve focused attention, concentration and to enter deep meditative and relaxed states. These recitals are called *proto-ragas* and have shown improvement in the cognitive development and behaviours of children with special needs in educational settings. It has been observed that children with special needs respond readily to *proto-ragas* and fast rhythmic music when compared to moderately-paced ragas. (Sairam, 2006).

Any chronic illness is not only manifested in its disease specific symptoms but also accounts for invisible symptoms like pain, mood disturbances, fatigue, etc. Putting the need of music in context, it may be a useful way of tackling pain and the overdependence on pain medications that have severe side effects and may even trigger addiction (Schieffer et al, 2005).

Music has been used as a treatment modality for several years. There is a growing body of evidence-based research showing the beneficial effects of music therapy, as an intervention, on physiological and psychological health outcomes (Fotakopoulos & Kotlia, 2018; Hegde et al., 2017). Past research has shown that music has stress-reducing abilities and also alleviates depressive symptoms in those experiencing acute and chronic pain (Cepeda et al., 2006) as it helps to counteract helplessness and anxiety that arise through clinic visits or during hospitalization (Phipps et al., 2010). Music has its obvious linkage to the emotions of a person and can help reverse brain chemistries and activate neural pathways that get dampened due to

the effects of endogenous opioids (anti stress mechanisms in the body) and release oxytocin that mediate positivity in the person (Panksepp & Bernatzky, 2002; Uvnas-Moberg, 1998).

According to the American Music Therapy Association (2006), “music therapy is the clinical and evidence-based use of music interventions to accomplish individualized goals within a therapeutic relationship by a credentialed professional who has completed an approved music therapy program”. The therapeutic relationship between a music therapist and a client involves a variety of music making methods. Music therapists are recruited in several sectors including health and disability, community care, geriatric care and private practice. Music as a therapeutic intervention is applicable to various branches of medicine such as neurology, surgery, oncology, cardiology, palliative medicine, etc. (Mofredj et al., 2016). The therapeutic use of music differs from its use for entertainment purposes and music education.

Music therapy lays emphasis on the healing purpose of music and contributes towards the healthy functioning and wellbeing of an individual. Music therapists work with people irrespective of their age, ability, musical skills, culture and background (Australian Music Therapy Association, 2012). Music therapy uses interventional modules based on music and musical experiences in order to address non-musical treatment goals. Such interventions concentrate on improving the quality of life of individuals throughout the lifecycle. It is administered to the normal population as well as to individuals with disabilities and/or illnesses (Earl E. Bakken Center for Spirituality & Healing, 2016; Hagemann et al., 2018).

Similar to music therapy is another form of treatment called *music medicine* which does not engage the patients actively. Rather a pre-recorded music chosen by the therapist may be used as a means for listening (Bradt, Dileo, & Shim, 2013). In this treatment modality, interventions are provided via listening devices and patients may or may not be involved in the selection of the music.

Primarily, music therapy can be divided into two types: *Receptive Music Therapy* and *Active Music Therapy*. In Receptive Music Therapy the client engages in listening to live or pre-recorded music as guided by a music therapist. It helps in alleviating stress, improving mood, pain reduction, relaxation and minimizing anxiety. Further, it also helps with improving the coping skills of clients (Li et al., 2015). Also known as ‘expressive music therapy’ Active Music Therapy requires clients to create vocal or instrumental music through singing, instrument playing or music composition. A study by Yinger and Gooding (2014) showed that active music therapy activates a greater number of areas in the brain than receptive music therapy. Bernatzky et al. (2011) remarked that “the alleviation of pain and the reduction of anxiety which can exacerbate pain appear to be the most promising use of music therapy.”

The Bonny Method of Guided Imagery and Music (BMGIM) was established in the 1970s by Helen Bonny. It is a music-centered approach to imagery where selected sequences of classical music are used to facilitate the client in narrating their journey and experiences (Hayes School of Music, 2021; Association for Music and Imagery, 2021).

Music therapy has been used to address several health outcomes in patients. Apart from its widespread application in neurological disorders, music therapy is being increasingly used as one of the treatment modalities for chronic illnesses (Gallagher, 2011). Research in this area indicates the beneficial effects of music therapy with respect to psychological distress, anxiety, sleep quality, depressive symptoms, pain and various physical symptoms in persons with cardiovascular diseases, cancer, chronic respiratory diseases, diabetes, etc. (Bradt, Dileo & Potvin, 2013; Li et al., 2011; Canga et al., 2015; Mandel et al., 2013).

This paper is a comprehensive review of music therapy: its aspects, efficiency, outcomes, when it is administered to individuals suffering with various chronic illnesses (hypertension, diabetes, cancer, chronic obstructive pulmonary disease, arthritis). It aims to

outline aspects of music therapy application in chronic illness care. Studies conducted in the past 12 years have been discussed to understand the evolution of music in healthcare. Literature was gathered from Google Scholar, PubMed, EBSCO and ScienceDirect using the search strings ‘music therapy and chronic illness’, ‘music therapy and hypertension’, ‘music therapy and diabetes’, ‘music therapy and cancer’, ‘music therapy and COPD’ and ‘music therapy and arthritis’. Snowball referencing was also utilized to gather more information.

The studies have been organized by the application of music therapy for highly prevalent NCDs such as hypertension, diabetes, cancer, COPD, and arthritis, but its efficiency may not be restricted to these physical conditions only.

Music Therapy in Alleviation of the Chronic Illness Experience

Hypertension

Hypertension is a highly prevalent clinical condition characterized by elevated blood pressure i.e., a blood pressure reading above 140/90 mmHg. This condition does not pose any specific manifestation of symptoms though it may have some warning signs like headaches, chest pain, and breathing difficulty. Its major threat is to the cardiovascular functioning of the body leading to a stroke, heart attack, heart failure, vision loss or kidney disease (World Health Organization, 2021; American Heart Association, 2021). Current treatment plans usually comprise of lifestyle modification (diet, smoking cessation and physical activity) and medications and may be optimally managed by the same.

Music interventions have been found to have significant effects on vital parameters like systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate and respiratory rate (Chatterjee & Mukherjee 2020; Loomba et al., 2012). A meta-analytic review by do Amaral et al (2016) found that music significantly improved systolic blood pressure when compared with

the control group. Chatterjee and Mukherjee (2020) investigated the impact of a 30-day music therapy intervention on healthy males in the age group 50-60 years. Selected participants were assigned to two groups: the experimental group was exposed to a 20-minute session of listening to Raga Todi (instrumental) of Hindustani Classical Music and the control group was kept at rest for the same duration. Results showed a significant reduction in BP reading, pulse rate and respiratory rate in the experimental group, but no significant change in the control group. Further, Loomba et al. (2012), in a meta-analytic study also found a significant reduction in SBP, DBP and heart rate.

Numerous studies have documented the positive results of music therapy and music-related interventions on hypertensive individuals (Sari & Rekawati, 2019; Kuhlmann et al, 2016). Zanini et al. (2009) noted an improvement in blood pressure control and quality of life in hypertensive patients who took part in music therapy sessions on a weekly basis. Participants belonged to both genders (men and women) and were aged above 50 years with stage 1 hypertension. In this controlled clinical study, participants were allotted to two groups and the experimental group was exposed to a combination of active and receptive music therapy intervention. In a literature review carried out between 2008-2018, Sari and Rekawati (2019) identified 15 studies that found the efficacy of music therapy in reducing blood pressure in elderly individuals. Further, Kuhlmann et al. (2016) conducted a meta-analytic study of 10 randomized controlled trials (between 1990 – 2014) which revealed a significant decreasing trend in SBP and DBP in adult hypertensive samples.

Different types of music have been used for therapeutic purposes in hypertensive patients. A randomized controlled trial by Im-oun et al. (2018) exposed participants (in stage-2 hypertension) in the experimental group to Thai instrumental folk music once a day, for thirty days. The home blood pressure and office blood pressure of all participants were recorded.

Findings showed a significant reduction in home SBP and home DBP in the experimental group as compared to the control group, however no difference was found with respect to office blood pressure.

Certain Indian studies have utilized Indian classical music or *ragas* for therapeutic purposes (Hegde et al., 2017; Deshmukh et al., 2009; Balan et al., 2009). Godbole and Basavaraj (2014) performed a randomized controlled trial to assess the effect of Indian classical music on 120 geriatric hypertensive patients aged between 60-85 years. Only the experimental group was exposed to four 20-minute sessions of pre-recorded Indian classical music. In comparison with the control group, statistically significant reductions in blood pressure levels, respiratory rate, pulse rate and state anxiety were observed in the experimental group.

In a study on 40 hypertensive Indian educators aged 30 and above, Angeline (2018) found a reduction in the mean SBP and DBP of the participants after listening to Abhibhairav raga for 20-30 minutes for five sessions. Another study attempted to study the impact of Bhimpalas raga on the autonomic functions of hypertensive individuals (Kunikullayaa, 2015). One hundred participants (30-60 years) were randomly allotted to one experimental and one control group. The music therapy intervention was provided to the experimental group for 15 minutes daily (5 days/week) for a period of 3 months along with lifestyle modifications. Participants in the control group only received lifestyle modifications. Findings indicated a significant decrease in stress levels, SBP and DBP in both the groups. There was a rise in heart rate variability indicators in both the groups as well. As there was no significant difference between the results of the two groups, it is unclear whether the music intervention played a role in the study.

In a contradictory study, Bekiroglu et al. (2013) did not find any significant differences between the experimental and control groups with respect to blood pressure and anxiety after

being exposed to Turkish classical music. Although, there was a higher reduction in mean systolic and diastolic blood pressure in the experimental group in comparison to the control group, the difference was not statistically significant. This result may be attributed to the type of music chosen for the intervention (Turkish classical music) as different types of music affect blood pressure levels differently. Further, participants in this trial were not given the option to choose their preferred music type, which in turn may have reduced the efficacy of this intervention.

Music therapy has been used in combination with progressive muscular relaxation (PMR) to examine its effects on hypertension. Astuti et al. (2019) recorded a decrease in systolic BP and diastolic BP in hypertensive individuals who engaged in progressive muscle relaxation and music therapy. This study followed a quasi-experimental design and divided a sample of 100 hypertensive adults (employed through stratified random sampling) into an experimental and control group. The experimental group received the intervention for 11 sessions (15 minutes each). However, it is difficult to point out the efficacy of a combined intervention (PMR + Music Therapy) over a PMR only / Music Therapy only intervention.

A combination of lifestyle modification intervention and music listening resulted in lower anxiety, lower systolic and diastolic BP (Kunikullaya et al., 2015). In another study, 100 hypertensive adults were assigned to two groups: one received a combined intervention of device-guided slow breathing exercises along with music listening; the other was exposed only to the music listening intervention. Results showed a decline in SBP and DBP in the first group that received a combined intervention (Nord, 2012). Another study by Purnomo et al. (2020) assessed the effect of a combined intervention of self-hypnosis and instrumental music on the blood pressure levels of hypertensive individuals. A sample of 46 hypertensive adults was divided into two groups. The experimental group received self-hypnosis and music therapy for

three days in addition to standard pharmacological treatment whereas the control group received pharmacological treatment only. The experimental group showed significant decreases in SBP and DBP.

Although a large amount of literature points towards the beneficial effects of music and music therapy on improving physiological parameters (SBP, DBP, pulse rate, respiratory rate) in hypertensives, the focus on psychological parameters has been minimal suggesting the need for clinically stringent music based trials. Most studies have roughly considered the same outcome measures. Moreover, the 24-hours ambulatory blood pressure measurement should be used to study the changes in blood pressure on a day/night basis in hypertensive individuals receiving music therapy interventions.

Psychosocial factors like health-related quality of life, perceived stress, mood, sleep quality, anger, optimism, social support, etc. should be explored in future research. Some studies do not have an adequate sample size for generalizability of results. A majority of the studies have used receptive music therapy with music-listening being the prominent form of intervention. Further, considering that music choices are specific to cultural backgrounds, a specific form of music may not bring about the same results when applied to individuals from different cultures (Good et al, 2000).

Diabetes

Diabetes mellitus is a metabolic disease, causing high glucose levels in the body, either due to the inability of the pancreas to produce insulin or the inability of the body to use the produced insulin (World Health Organization, 2021). There are different types of diabetes conditions. Type 1 diabetes refers to an autoimmune condition in which the immune system attacks the pancreatic cells rendering them unable to produce insulin. Type 2 diabetes is a more prevalent chronic condition in which the body becomes resistant to insulin. Gestational diabetes

is another kind found in pregnant women, in which the placenta produces insulin resistant hormones thereby increasing glucose levels.

Commonly reported symptoms in a diabetic condition include excessive hunger, fatigue, lethargy, frequent urination, weight loss, etc. At an early stage these are mild and may go unnoticed. Type 2 diabetes is caused by a combination of factors such as a genetic predisposition, obesity, stress, poor nutrition, lack of exercise, and may be managed with medication and lifestyle modifications like changes in diet, exercise and stress management. If left untreated, diabetes can affect the nerves, kidneys, eyes and other important organs of the body (Watson, 2020). This condition can be debilitating in daily life and is often associated with distress, negative emotions, depression, anxiety and delirium (Kalra et al., 2018). Studies assessing the effect of music therapy on diabetes are scarce, however, most of them point towards its beneficial effects either in terms of disease management or impact on associated psychosocial factors.

A study by Cioca (2013) aimed to find the effect of music on variations in glycaemia. This experimental study recruited 120 adults divided into 3 groups of forty each: an experimental group of diabetic adults, a control group of diabetic adults and another control group of healthy adults. The mean age of all participants ranged between 56-60 years. Except the control group of diabetics, participants from both the groups were exposed to joyful and relaxing music and it was observed that blood glucose levels significantly decreased for the experimental diabetic group. No significant changes were observed in the control groups. Additionally, it was found that relaxing music and joyful music had no differential impact in lowering blood glucose levels.

Another study in India, compared the difference between silent music interventions (writing the experiences of music, likes and dislikes of music, listening to music) and active

music interventions (singing devotional songs in 'lead and follow' manner) in achieving autonomic balance in 29 diabetic patients (Rao & Nagendra, 2014). The participants (mean age = 56 years) received both silent and active music interventions, each for a period of 45 minutes. Active music intervention was found to have a superior effect to silent music intervention although both the interventions showed a significant change in their Gas Discharge Visualisation (GDV) parameters which is an indicator of autonomic balance.

The combined effect of music therapy and a non-pharmacological intervention on diabetes have also been assessed. Mandel et al. (2013) examined the impact of a diabetes self-management education / training (DSME/T) programme implemented along with music therapy facilitated by a board-certified music therapist (MT) on the health outcomes of diabetic patients. The sample included 199 diabetics (30-85 years) who had either type 1, type 2 or pre diabetes and were divided into 3 groups: DSME/T group, DSME/T plus MT group and DSME/T plus music-assisted relaxation and imagery via CD recording (MARI CD) group. The MARI CD group was exposed to music selected by the researcher and verbal suggestions, while the MT group was exposed to relaxing and energizing music selected by the participants. This study illustrated that DSME/T correlated with all measured outcomes such as blood pressure, glycosylated hemoglobin (A1C), body mass index (BMI), trait anxiety, state anxiety, and stress. The music intervention groups (MT and MARI CD) had significantly larger reductions in SBP and DBP. The study highlighted that music therapy facilitated by a board-certified music therapist along with patient education may help elevate diabetes management.

Music media therapy has also been used along with lower extremity exercise in a study by Ji et al. (2015) to find its effects on diabetic patients' adherence to exercise. A sample of 72 diabetic adults were allotted to an intervention group ($N=34$) and a control group ($N=38$). Participants in the intervention group were exposed to a composed instrumental piano song of

4/4 beat from the 'soothing aesthetic' genre (selected by participants) while engaging in 15 minutes of lower extremity exercise daily for 6 months. The intervention group showed higher adherence to the exercise regimen even after three months in comparison to the control group. After six months, the intervention group showed improvements in physiological indicators of blood circulation as well.

Contradictory evidence has also been found by Groener et al. (2015) in their investigation of group singing as a therapeutic technique for insulin-dependent diabetic patients. Thirty-five diabetic adults were selected to participate in the trial, 18 were allocated to the experimental group and 17 were allocated to the control group. Both groups completed a diabetes education programme; the experimental group further participated in a group singing intervention (led by a trained music teacher) for 3 days after attending the education program. The study found a weak effect of group singing on patients' mood and no significant effect on glucose control, quality of life and stress. The result could be attributed to the short duration of the intervention (3 days). A longer duration of the intervention might be able to bring about better results.

An Indian study (Singh et al., 2015) reported yoga to have superior effects compared to music therapy or standard care alone in diabetic individuals. This randomized controlled trial recruited diabetic adults into 3 groups: 112 in a yoga group (mean age = 50 years), 110 in a music group (mean age = 50 years) and 115 in a control group (mean age = 49 years). The yoga group practiced pranayama and yoga-asanas for 6 months after a training period of 2 weeks. The music group received receptive music therapy and listened to Indian classical instrumental music for 30 minutes twice a day over a period of 6 months. After 6 months, the outcome measures showed that practicing yoga as well as music therapy had positive effects on glycemic control, lipid profile, BMI, anxiety, depression, self-efficacy and quality of life in

diabetes patients. Significant improvements were observed in the music group; however, the changes were much higher in the yoga group. It is important to note that the music intervention was not facilitated by a board-certified music therapist in this study.

Paucity of evidence makes it difficult to assess the role of music therapy in diabetes care. Replication of research is required with higher sample sizes to arrive at a definite conclusion. Further, there is an absence of a licensed music therapist in most of the studies. These limitations should be confronted in future research.

Cancer

A cancer diagnosis brings with itself immense fear and stress for patients as well as their families. Cancer refers to a group of diseases that involve uncontrollable and abnormal cell growth in one or more parts of the body. Carcinoma, sarcoma, lymphoma, leukemia and melanoma are some types of cancer. The most common cancers in the year 2020 were cancers of the breast, lung, colon and rectum, prostate, skin and stomach (Ferlay et al., 2020). A genetic predisposition in combination with physical carcinogens (UV rays, ionizing radiation) or chemical carcinogens (asbestos, tobacco smoke, arsenic) or biological carcinogens (infections due to bacteria, viruses or parasites) causes malignant tumours to grow and metastasize. The symptoms of this disease vary with the type of cancer and they usually include, but are not limited to, fatigue, lumps in the body, cough or hoarseness, night sweats, sudden weight changes, bladder/bowel changes, etc. All types of cancers are treated through surgery, chemotherapy and/or radiation therapy. During the early stages of the disease, chances of complete cure are high if intervened in a timely and effective manner (National Cancer Institute, 2019; World Health Organization, 2021).

While music does not directly help in the treatment of cancer, it has been found to reduce patients' symptomatic complaints. Music therapy when used in conjunction with

conventional cancer treatments, has been found to positively control or reduce symptoms of pain, discomfort, fatigue and improving overall quality of life in cancer patients as well as survivors (Krishnaswamy & Nair, 2016; Alcântara-Silva et al., 2018; Hilliard, 2003).

The psychosocial impact of cancer involves a range of negative emotions along with changes in personal relationships (Stanczyk, 2011). Anxiety, depression, denial, uncertainty, fear of death, poor quality of life, anger, isolation, body image issues, etc. are common psychological outcomes of dealing with cancer. Although conventional treatment focuses on treating the disease through surgery, chemotherapy and radiotherapy; it does not target such psychosocial factors which also play a role in maintaining the disease state. Further, as a consequence of medical treatment, cancer patients experience secondary effects like pain, nausea, fatigue, loss of appetite, loss of interest, isolation, body image issues, and depressive symptoms (Carelle et al, 2002).

A large body of research points towards the beneficial effects of music therapy in cancer care. Several studies have confirmed the positive effects of music therapy on symptom management of cancer. Music as a therapeutic intervention has been found to alleviate pain, anxiety, depression, nausea, fatigue and other side-effects of radiation and chemotherapy. Patients also experienced improvement in overall quality of life and relaxation (Rossetti et al., 2017; Jasemi et al., 2016; Hilliard, 2003; Potvin et al., 2015).

Music therapy has been targeted to improve the sleep quality of cancer patients. Vinayak et al. (2017) found an enhancement in sleep quality in hospitalized cancer patients. This RCT was carried out on 184 patients who were assigned to a control group and two experimental groups – active music therapy group (AMT) and receptive music therapy group (RMT). The AMT group participated in daily 20–30 minute sessions of playing a musical instrument (guitar) and singing along with it for 10 days; whereas the RMT group participated

in music-listening sessions of their preferred songs for the same duration. The control group ascribed to normal routine medical care. Post-test results showed a significant improvement in sleep quality scores in the experimental groups. Further, active music therapy was found to be more effective than receptive music therapy.

In another study, Lafci and Oztunc (2015) studied sixty hospitalized breast cancer patients (27-69 years) who were divided into an experimental (N=30) and a control (N=30) group. The experimental group was exposed to a music-listening session of Turkish soft classical music every night before bedtime for a period of 7 days while the control group continued with standard medical care. Sleep quality of the experimental group significantly improved whereas sleep quality of the control group worsened during their stay at the hospital.

Music therapy has also been associated with themes of spirituality in cancer patients. McClean et al. (2012) conducted a qualitative study on 23 cancer patients who attended a 5-day residential retreat programme at a cancer care center. The active music therapy sessions were facilitated by a music therapist for duration of 1.5 hours. Post session telephonic interviews with the participants revealed the emergence of themes related to spirituality such as transcendence, connectedness, search for meaning, and faith and hope. Studies have also found an increase in spiritual well-being in patients after music therapy sessions in hospital/hospice settings (Renz et al., 2005). Cook and Silverman (2013) conducted a mixed-methods study on 17 hospitalized cancer patients to examine the effect of music therapy on spirituality. Participants were randomly divided in 2 groups (experimental and control). A certified music therapist conducted three sessions of active music therapy in the experimental group. Posttest results showed significant increases in peace and faith scores in the experimental group. A qualitative analysis revealed that music therapy helped them feel closer to God and also improved their mood.

A review by Gramaglia et al. (2019) showed that music therapy has been used in combination with non-pharmacological interventions in several studies to improve quality of life and reduce depression, anxiety and pain perceptions. A RCT was conducted by Zhou et al. (2015) on 170 breast cancer patients to examine the effect of music therapy coupled with progressive muscle relaxation training (PMR) on health outcomes. A sample of 170 participants were divided into 2 groups (experimental and control). The experimental group (N=85) received music therapy and PMR within 48 hours of radical mastectomy, twice a day for 30 minutes. Results reported a reduction in depression, anxiety and length of hospital stay in the experimental group after receiving music therapy coupled with progressive muscle relaxation training.

The Bonny Method of Guided Imagery and Music (BMGIM) has been used by Burns (2001) to investigate its effect on cancer patients. A sample of eight cancer patients were equally divided into an experimental and a control group. In the experimental group, BMGIM elevated mood, improved quality of life and increased well-being (physical, psychological and spiritual) too. Interestingly, participants' scores on mood and quality of life continued to increase even after the intervention was completed. A doctoral dissertation used qualitative methods to assess the impact of BMGIM for 10 sessions with cancer survivors (N=6). The intervention was conducted by a therapist twice a week for 5 weeks. Participants exposed to this intervention reported improved mood, new perspectives on past/present/future, enhanced hope, improved self-understanding, coming to terms with life and death; and opening towards spirituality (Bonde, 2005).

BMGIM was also utilized by in another doctoral dissertation work by Bhana (2016) on a sample of 24 cancer patients. Quantitative analyses indicated improvements in psychological and spiritual well-being, and decrease in fatigue and pain severity. In addition, qualitative

analysis surfaced four themes: development of coping strategies, experience of physical wellbeing, psychological wellbeing, and spiritual wellbeing.

Bradt et al. (2015), in their study on cancer patients, compared the effect of music therapy and music medicine on psychological outcomes. The study followed a mixed methods approach in a sample of 31 adult cancer patients who were exposed to two sessions of music therapy (involving interactive music making) facilitated by a music therapist and two sessions of listening to pre-recorded music. According to the quantitative data obtained, both the interventions were equally effective in improving symptom management. Themes such as hope for survival and connecting to a pre-illness self emerged. However, participants preferred to choose music therapy over music medicine as they believed it helped them embrace their creative and playful side.

Chronic Obstructive Pulmonary Disease (COPD)

Chronic Obstructive Pulmonary Disease is a group of progressively declining lung diseases that are characterized by emphysema, inflammation of the lungs and obstruction of airflow resulting in breathing difficulty, dyspnea, sputum production, cough and wheezing. Smoking is one of the major reasons of COPD. Long-term exposure to fumes/dust or genetic causes may also result in the development of COPD. Treatment includes taking inhalers and regular medication, pulmonary rehabilitation, surgery/lung transplant and making lifestyle choices such as quitting smoking. In the absence of treatment, symptoms progressively deteriorate (British Lung Foundation, 2019).

Music therapy is studied on both physiological and psychological parameters in COPD patients. A randomized control trial in China (Liu et al., 2019) examined the effects of group singing on depressive symptoms and quality of life in individuals diagnosed with COPD. A sample of sixty participants was recruited for this study. The experimental group ($N=30$)

engaged in group singing once a week for 24 weeks and received routine health education. The control group received routine health education only for the same period. Results showed a reduction in depressive symptoms and an increase in quality of life scores at 3 months and 6 months after intervention.

Another study compared the effects of a singing intervention and a handicraft intervention, when coupled with physiotherapy on pulmonary function parameters and quality of life in 30 COPD patients (Bonilha et al., 2009). Participants were equally put into two groups. The singing practice intervention was conducted by a singing teacher and a physiotherapist. The intervention consisted of relaxation exercises followed by various singing exercises. On the other hand, the handicraft intervention led by a physiotherapist and a handicraft work teacher consisted of relaxation exercises followed by the execution of handicraft work like paper folding, collage and drawing. A comparison between the health outcomes of the two groups indicated that the singing group showed improvements on maximal expiratory pressure, dyspnea, and inspiratory capacity ($p = 0.01$), and decreases of expiratory reserve volume. Both the groups displayed improved scores of quality of life.

McNaughton et al. (2016) conducted individual interviews and focus group discussions with COPD patients to explore the ways in which community singing group participation affected their health and well-being. Group singing was described as a highly positive experience for the participants. Four key themes that emerged out of the study were: being in the 'right space', connection with others, experience of purpose and growth and participation in a meaningful activity.

Canga et al. (2015) examined the impact of active music therapy as an adjunct to pulmonary rehabilitation in COPD patients through an RCT. A sample of 98 COPD patients diagnosed with GOLD stages II/III/IV (48-88 years) were selected for the study. Certified

music therapists provided music therapy to the experimental group through live music visualizations, wind instrument playing inclusive of clinical improvisation, and singing in addition to pulmonary rehabilitation for a duration of six weeks. The control group received standard pulmonary rehabilitation only. Active music therapy in combination with pulmonary rehabilitation was found to decrease depressive symptoms, perceived dyspnea and enhance a sense of control in COPD patients; in comparison to pulmonary rehabilitation only. This study strongly suggests the implementation of music therapy as an adjunct therapeutic technique.

Further, Singh et al. (2009) employed a sample of 72 Indian COPD patients who underwent a recent episode of exacerbation to assess the impact of music therapy (MT) and progressive muscle relaxation (PMR) on health outcomes through a randomized controlled study. The experimental group received music therapy by listening to music selected by the participants ranging from 60-80 beats per minute for a period of 30 minutes. The control group practiced PMR through a pre-recorded audio set of instructions. After two sessions, significant results were found in both groups. However, compared to the PMR group, COPD patients exposed to the MT group experienced reduced anxiety, dyspnea, systolic blood pressure, pulse rate and heart rate.

Another study compared the difference between the effect of Western classical music and Turkish classical music on physiological and psychological measures of 96 hospitalized COPD patients (Horuz et al., 2017). Participants were divided into 3 groups: one was exposed to Western classical music; another was exposed to Turkish classical music and the third group was a control group. Although both experimental groups showed decreased anxiety, systolic blood pressure and diastolic blood pressure, in comparison to the controlled group; no significant differences between the two groups were observed.

The effect of music therapy has been studied on various outcome measures in COPD patients. A Chinese five-element music therapy intervention based on the midnight-noon ebb-flow theory was used to examine its effect on the sleep quality of COPD patients (Zhang et al., 2017). A sample of sixty patients were allocated to an experimental group (N=30) and a control group (N=30). Music-listening sessions were provided to the experimental group for 30 minutes over a period of 8 weeks. Standard medical care was provided to the control group. Findings indicated an improvement in sleep quality and reduction in daytime fatigue in the experimental group in comparison with the control group.

Another study recorded the beneficial effect of rhythmically enhanced music to increase 6-minute walk distance in COPD patients (Hernandez et al., 2020). Twenty five men with moderate-to-severe COPD were selected to complete three 6-minute walk tests: with music, with rhythmically enhanced music and with no music. Results showed that participants walked 12 meters farther ($p=.015$) during the test in the rhythmically enhanced music condition when compared with the other two conditions.

Evidence related to this section is inconclusive as several gaps in literature exist. Though, a majority of the studies showed positive results of music therapy on COPD patients, elaborate investigations are required to assess the impact of music therapy on COPD. There is insufficient information with regard to the effect of combined interventions on the illness. Further, differences between active and passive music interventions need to be examined.

Music Therapy and Arthritis

Arthritis refers to a group of diseases that affect the joints of the body and the tissues that surround the joints. Degenerative arthritis, inflammatory arthritis, infectious arthritis and metabolic arthritis are the different types of arthritis. Symptoms of this condition include pain, swelling, stiffness of joints and a decreased range of motion. It is more common

in women, than men; and is managed using medication, physical or occupational therapy, assistive aids, patient education and support, and joint replacement surgery. If left untreated, the condition will progressively worsen and lead to disability (Nichols, 2017).

The outcome of music therapy on arthritis is documented by only a handful of studies. Although sparse, studies do show the beneficial effect of music therapy on lessening pain due to arthritis and osteoarthritis (McCutchen, 2007; Santos & Carvalho, 2012; McCaffery & Freeman, 2003).

Ottaviani et al. (2012) evaluated the impact of a music therapy intervention on osteoarthritis patients undergoing knee joint lavage surgery. A sample of 62 participants (mean age = 68.8 years) were randomly allocated to an intervention group ($N=31$) and a control group ($N=31$). The intervention group was exposed to recorded music that was played during the preparation for the procedure as well as during the entire procedure. No intervention was given to the control group and participants underwent standard medical procedure. Participants belonging to the intervention group reported a decrease in pain, heart rate and perioperative anxiety levels. Additionally, tolerability of the surgical procedure was also found to be higher in these patients. However, no difference in SBP or DBP was found compared to the control group.

Four case studies aimed to inspect the effect of music therapy on the management of hand osteoarthritis in older adults (Zelazny, 2001). Four participants received a music therapy intervention for 30 minutes, 4 days a week over a period of 4 weeks. The intervention involved playing melodies on an electronic keyboard. The researcher found that keyboard playing decreased arthritic discomfort and increased finger strength/dexterity, range of motion and finger pinch meter in the participants. In addition, participants also found an improved structure of their leisure time and increased socialization.

Jeong et al. (2010) recruited a sample of 31 women with osteoarthritis who received a Korean music therapy intervention (Jang-Gu) twice a week, for 12 weeks. Findings indicated a decrease in body discomfort but no changes in depression, stress and pain scores. Further, a comparative study by Innes (2018) aimed to assess the impact of mantra meditation versus music listening on health outcomes of older adults with knee osteoarthritis. A sample of 21 participants were randomized into a mantra meditation (MM) group (N=11) and a music listening (ML) group (N=11). Both groups were instructed to practice their respective interventions for 15-20 minutes twice every day, for a period of 8 weeks. Both groups showed significant decreases in pain and discomfort along with greater improvements in sleep, mood and quality of life; however, greater changes were noted in the MM group as compared to the ML group.

As the literature available in this area is still in its infancy, more studies are required to assess the effect of music therapy on arthritis and to replicate results. The limited evidence available is not decisive as most of the studies have an inadequate sample size and an absence of a control group. Further, there is a lack of clarity regarding the presence of a trained music therapist while delivering the intervention. Majority of the studies have used receptive music therapy on the participants, therefore, the effect of active music therapy on arthritis should also be investigated.

Conclusion

In summary, it may be said that this review found a trend of therapeutic properties of music therapy on chronic illnesses. Music therapy is associated with positive outcomes across different chronic illnesses. It does not affect the disease itself but focuses on the physiological and psychological needs that arise from treatment. However, a cause-effect relationship cannot be established between the two as there is a lack of sufficient literature.

The application of music therapy in chronic illness care is in its nascent stages and plenty of studies are required to assess and replicate the role of music therapy in chronic illness. Such studies need to be well-designed, randomized and controlled with a high sample size. Studies comparing different types of music need to be carried out. Further, the combined effect of music therapy and other interventions may be explored. It is imperative to keep in mind that the presence of a music therapist is essential for the facilitation of music therapy. However, most experimental studies do not have certified music therapists to deliver interventions. This aspect should be looked into during the research process.

Music therapy is widely used in developed countries. Majority of music therapists who belong to the United States work in the field of oncology (Stanczyk, 2011). Although music therapy is not a new concept to India, it is not an established profession in the Indian healthcare system due to lack of awareness and scientific research. The healing effects of Indian classical music have been documented in ancient Indian texts like the *Vedas* but there is a dearth of Indian scientific studies assessing the impact of music therapy in health and illness.

Music therapy is a valuable, harmless and cost-effective non-pharmacological intervention. Interactive music therapy can be used to develop rehabilitation programmes for cardiac and pulmonary disease patients. Therefore, further research should be carried out to throw light on its therapeutic effects for holistic patient care.

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