Music Therapy - The Evidence

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Abstract:
Music therapists are frequently required to provide proof of the efficacy of music as a therapeutic medium. A literature review is presented to show clear evidence of music therapy as a viable means of therapy in diverse applications. Selected articles from music therapy Journals have been reviewed to represent music therapy clinical practice with different age groups and client populations. Emphasis is placed on research in which gains are made by the clients through music therapy. The literature review indicates that music therapy is successfully incorporated into treatment/education programmes for clients with special needs due to disabling conditions or illness, and in the management of pain.

To present evidence for the efficacy of music as a therapeutic medium, a review of the research literature has been undertaken. Selected articles from the *Journal of Music Therapy, Music Therapy Perspectives, Music Therapy* (the Journal of the American Association for Music Therapy), and the *British Journal of Music Therapy* have been reviewed. Articles were chosen for review on the following criteria:

(i) that there were clearly stated variables to be measured
(ii) that the focus of the research was related to clinical objectives
(iii) that the results were substantiated by statistical analysis or some other acceptable means of measurement.

An attempt has been made to include evidence from each of the disability/disorder/disease areas across the age span from foetus to frail aged.

Music-Assisted Labour

There is increasing evidence of the use of music (taped programmes of carefully selected music) to assist at each stage of labour. Music has been effective in cueing rhythmic breathing, assisting relaxation, and as a focus for pain relief (Hanser, Larsen and O'Connell, 1983). In a study involving 20 women, 13 in an experimental group, and seven in the control group, Clark, McCorkle and Williams (1981) measured successful labour experiences in terms of pain relief and satisfaction with the birthing experience. The experimental group had music during delivery, the control group had traditional options of pain relief. The experimental group showed higher ratings on five of the seven indices.

Response of Infants to Music

Standley and Madsen (1990) studied 24 infants aged beteen 2 and 8 months on preference for mother's voice, other female voice and music. Measures were taken of listening time and videotapes of the infants' responses were analysed. Results showed that the babies did discriminate between the stimuli. Younger babies (2 months) preferred their mothers' voices, whereas older babies equally preferred mother's voice or other female voice. Videotape analysis showed that the babies listened more attentively to music than other stimuli.

Paediatrics

Much of the research in the paediatrics area comprises studies of children's responses to hospitalisation and the use of music to lessen anxiety. A child's reaction to hospitalisation may include anxiety, fear, withdrawal, regression and defiance, quite apart from

the reactions to illness itself (Adams, cited in Froehlich, 1984). Froehlich compared the efficacy of music therapy and play therapy sessions in facilitating verbalisation about the hospital experience. Forty children were studied and results showed that music therapy elicited more verbalisations about hospitalisation than play therapy.

Chetta (1981) studied 75 children between 3 and 8 years to determine whether music therapy could reduce fear and anxiety during pre-operative medication. The study incorporated a three-group comparison design where group one (control group) received verbal information only about operation procedures, experimental group one received verbal information with music, and experimental group two received verbal information with music, plus music immediately prior to pre-operative medication on the morning of surgery. Experimental group two (with music) was consistently rated as showing less anxiety before and during pre-operative procedures.

Marley (1984) implemented music therapy sessions for infants and toddlers aged 5 weeks to 36 months who showed signs of distress due to hospitalisation. Signs such as crying, throwing objects, absence of vocalisations, lethargy and body tension were identified as indicating distress. Music therapy sessions included relaxation, games, movement to music and songs. Results of the study showed that music therapy plus the interaction with the music therapist effectively reduced stress-related behaviours.

Several studies have been made of the effect of music on children who are terminally ill. Fagen (1982) presented case studies of children confronted with death, and described how music helped the children and their families to work through fear, pain and separation. Brodsky (1989) reports on the use of song activities and the Omnichord in resolving anxiety and fear-provoked fantasies following chemotherapy and radiation treatment.

McDonnell (1984) outlines a case study of Edward, aged 3, hospitalised with a fractured femur following child abuse. The music therapist used the singing of songs, music games (including role plays) and the play of instruments to lessen Edward's depression, lessen the controlling attitude of Edward's mother, and facilitate the verbalisation of guilt by Edward's father, thereby breaking the family pact of silence.

Pre-School children

Music therapy has been incorporated successfully into programmes for pre-school aged disabled children, to develop specific skills, such as motoric development, speech and language development, arithmetic skills, reading skills and memory span. Hoskins (1988) conducted research with 2-5 year old developmentally delayed and non-delayed. He used Improvised Musical Play (IMP), which is the improvisation of lyrics by the therapist to describe the ongoing play behaviour. The lyrics are sung or chanted in a rhythmic beat to bring the children into closer proximity with each other and to sustain social play. The group of children involved in IMP sustained play for three times the duration expected.

Harding and Ballard (1982) found that music introduced into individual sessions for three physically disabled pre-schoolers increased spontaneous speech through verbal responses to questions, initiation of verbal interaction and verbalisation through story telling.

Learning Disabilities

In an interesting study of the use of rock music to help children with Attention Deficit Disorder, Cripe (1986) found that rock music decreased agitated motor behviour, however, there was no significant effect for increasing attention span.

The use of music with language delayed apraxic children has been studied by Krauss and Galloway (1982). Two children with delayed speech and developmental apraxia served as their own controls during a two-month research period. Pre- and post-tests were made following (i) traditional speech and language therapy and (ii) Melodic Intonation Therapy (MIT). Gains made after MIT included skills in naming nouns, longer phrase lengths, verbal imitation and articulation.

A study of normal and learning disabled students aged between 9 and 12 years measured the use of music (melodic and rhythmic cues) as an aid to short-term memory. Learning disabled children are often deficient in initiating cueing strategies to assist memory. In Gfeller's study (1983), children who experienced music as well as modelling and cueing showed significant gains in retention of information. Gfeller (1987) also described the use of songwriting in an integrated language approach for learning disabled children.

Roskam (1979) studied the use of music to assist reading skills. Her subjects were 36 learning disabled children aged between 6 and 9 years. The children were assigned to three groups under the following conditions: (1) music therapy treatment, (2) usual remedial reading activities, and (3) a combination of both. The music therapy treatment group showed the highest mean difference in non-verbal auditory discrimination, verbal auditory discrimination, reading recognition, and reading comprehension, however these results were not statistically significant.

Sensory Impaired Children

Hearing impaired children show distinctive speech and vocalising patterns. The primary characteristic of speech and vocalising in hearing impaired children is that of a high pitched monotone (fundamental frequency). Hearing impaired children vary the pitch of their speaking voice far less than normal hearing children, yet little attention has been given to vocal pitch training of hearing impaired children. Darrow and Starmer (1986) however, have introduced a treatment programme comprising the singing of songs and vocal exercises to develop pitch range. Their results indicate a reduction of the fundamental frequency (monotone) in vocalising and an increase in use of frequency range.

In a further study by Darrow (1990) to develop vocal pitch accuracy in hearing impaired children, it was found that frequency feedback needs to be matched to the child's individual audiological response curve.

Physically Disabled Children

Staum (1983) examined the effectiveness of music (specifically rhythm) on the rehabilitation of gait disorders. Results showed that rhythmic stimuli enhanced gains in rhythmic walking, independent walking and consistency of walking speed. Proprioceptive control of rhythmic walking was best facilitated in hemiparetic stroke conditions, spastic disorders, and arthritic and scoliotic conditions.

Emotionally Disturbed Children

Music has long been used as a positive reinforcement strategy for appropriate behaviour, with withdrawal of the music stimulus occurring as inappropriate behaviour is evidenced. Cook and Freethy (1973) eliminated complaining behaviour in emotionally disturbed children using music as the positive reinforcement of appropriate behaviour.

McCarty, McElfrech, Rice and Wilson (1978) modified inappropriate aggressive behaviour of emotionally disturbed children during the bus journey to school, by rewarding appropriate behaviour with the children's preferred music (rock) played on the bus radio.

Wilson (1976) successfully used rock music as a reinforcement for appropriate behaviour during art lessons. The children were aged between 5 and 7 years and showed behavioural and emotional disturbance. After 15 sessions over five weeks, the mean number of stops for undesirable behaviour was reduced from 17.6 stops per lesson to 1.33. Children not only attended better to their art work, but they also sang along with the music and imitated instrumental sounds.

Henderson (1983) studied group cohesion in 13 emotionally disturbed adolescents after 18 music therapy sessions. There were significant gains in the adolescents' perception of group cohesion as indicated by an increase in the number of group pronouns (e.g., 'we', 'us').

Kivland (1986) increased self-esteem in an adolescent with personality disorder. Self-esteem was measured by the frequency of his negative and positive comments and by his ability to accept positive comments appropriately. The music therapy treatment comprised piano lessons, held twice a week over 12 weeks. At the end of 12 weeks negative comments about himself had decreased and positive comments increased but only when prompted by the therapist. The adolescent's ability to list what he had done well transferred to other disciplines.

Edison (1989) assigned 25 emotionally disturbed students to three experimental conditions – (1) music therapy with structured target behaviour, (2) general music therapy session, and (3) a control group having no music therapy. Students in experimental groups one and two evidenced scores twice as stable as those in the control group.

Autism

Blackstock (1978), conducted a series of experiments to test hemispheric dominance/specialisation in autistic children. He found that when given a choice, autistic children prefer to listen to the medium of music than the spoken word, and that autistic children showed a left ear preference (activating right hemisphere function) for listening to music.

Evidence indicates that autistic children tend to be auditory processors, not visual, when listening to music (Thaut, 1984).

DeMyer (1979, cited in Nelson, Anderson and Gonzales, 1984) found 90% of a large sample of autistic children demonstrated positive responses to music. However 6% showed an adverse response (e.g. covering ears with hands). Music therapists therefore need to be sensitive to those autistic children rejecting music, as each child's response to music is highly individualistic. Some children display over-arousal to music, others under-arousal. There may be paradoxical responses e.g. over-arousal resulting in withdrawal, or hyperactivity when there is a lack of sensory input.

Combined music and movement activities may induce self-stimulative behaviour in autistic children. DeMyer (cited in Nelson, Anderson and Gonzales, 1984) found that self-stimulative behaviour was evoked in 24% of a sample of autistic children. Soraci, Deckner, McDaniel and Blanton (1982) found that self-stimulative behaviour was increased when music of medium-speed rhythms was played. Self-stimulative behaviour decreased for slow or for very fast rhythms.

Music is used effectively as a motivator for autistic children's involvement in education programmes. Music enhances their involvement in social, language and motoric functions (Burleson, Centre and Reeves, 1989), however the effectiveness of the music programme is determined by the individual child's response and choice of mediating strategy.

Intellectually Disabled Children

(i) Mild-Moderately Disabled/Educable Intellectually Disabled

Music has been used to help intellectually disabled children achieve goals in social skills, cognitive skills, physical co-ordination and behavioural areas (Bruscia, 1982, Dorow, 1976, Myers, 1979, Moore and Mathenius, 1987, Jorgenson and Parnell, 1970, Groeneweg, Stan, Celser, MacBeth and Vrbancic, 1988). An essential skill for intellectually disabled children to develop is that of being able to follow directions. Music activities most frequently employed to develop this skill include instrumental playing and body action songs. In a study comparing instrumental activities and movement, Spencer (1988) found that the movement activities were more effective than instrumental activities in developing direction-following abilities.

Larson (1977) investigated the singing ranges of intellectually disabled and normal children in relation to published song books used in singing activities. She found that intellectually disabled voices were significantly lower (G below middle C to G above middle C) than the range found in song books, suggesting a need for transposing songs into appropriately lower keys.

Flowers (1984) investigated the preference of Down's syndrome children and normal children for variables of pitch (high, low), dynamic level (loud, soft) and rhythmic variety (rhythmic, non-rhythmic). Normal children preferred music at forte (loud) volume, whereas Down's syndrome children preferred music at piano (soft) volume. All other variables showed no significant difference.

(ii) Severely-Profoundly Intellectually Disabled

Stevens (1971) studied the relationship between tempo of music and stereotypic rocking in intellectually disabled children, finding a tendency for slow tempos to decrease stereotypical movement of intellectually disabled children who were high frequency rockers. Soraci, Deckner, McDaniel and Blanton (1982) also found that increased tempo accelerated maladaptive reactions as did an increase in ambient noise.

Intellectually disabled children experience difficulty with expressive communication and profoundly affected children often use vocalisations and infantile gestures to communicate wants and ideas. Wylie (1983) tested the effectiveness of various instrumental timbres to elicit vocalisations in profoundly intellectually disabled children and found in order of effectiveness that solo voice, piano and guitar elicited a greater number of responses. Cunningham (1986) found that vocalisations increased when music was at a soft volume, and decreased during loud music. Dorow and Horton (1982) found that bed-bound severely disabled people responded more when the auditory stimulus (sound source) was 5" from the client's head, than when the sound source was played at the foot of the bed. Proximity of stimulus is clearly essential in eliciting response.

Joyce and MacNamara (1983) studied the response of severely and profoundly intellectually disabled residents to music at four levels of volume – 60 db, 85 db, 92 db and no music. Inappropriate stereotypic acts significantly reduced when the music was played at 60 db. Music at 92 db produced increased sterotypic behaviour as did the no-music condition.

Metzler (1974) studied the use of music to increase imitative behaviour in severely disabled female residents, and found that imitative motor skills were successfully shaped when music was used to reinforce the behaviour.

Substance Abuse

Music therapy programmes have been effective in facilitating group process and in enhancing awareness of feeling states in patients suffering from drug and alcohol abuse (Murphy, 1983, Dougherty, 1984).

James (1988a and 1988b) outlined a music therapy treatment programme for alcoholic patients which enhanced a group identity and cohesiveness, self-awareness, stress reduction and the expression of feeling and emotion. Songwriting and group improvisation decreased tension, and relaxation training and Guided Imagery and Music provided an alternative to addictive mind-altering drugs and alcohol.

Anxiety States/Stress Management

One of the most common forms of treatment for anxiety and stress reduction is music-assisted relaxation (Hanser, 1985). A number of studies have looked at this area of research. Davis and Thaut (1989) conducted physiological measurement of (a) vascular constriction, (b) heart rate, (c) muscle tension, and (d) finger skin temperature, and found that state anxiety decreased and relaxation increased from pre- to post-conditions with music. They also found significant differences between subjects, indicating that people respond idiosyncratically to physiological testing.

Logan and Roberts (1984) studied the effect of (1) Stephen Halpern's music (New Age), (2) 'superlearning' music (Baroque), and (3) no music, and found that those in the Halpern group had higher tension levels than those who had no music.

Gross and Swartz (1982) studied patients exhibiting trait anxiety and state anxiety. A music therapy programme over eight weeks comprised singing, improvisation and follow-up discussions (music preferences were acknowledged). The control group had group psychotherapy. Trait anxiety decreased in the experimental group and increased in the control group. State anxiety was reduced as measured by anxiety scores before and after a music therapy session.

Psychiatry

Ficken (1976) describes songwriting techniques for clients diagnosed with depressive illness. The lyrics of the song described each person's feelings about the meaningfulness of the group and the song became the group's theme. Songwriting also helped alcoholics recognise early stages of alcoholism by writing honest lyrics. Each group member retained a copy of the song to assist in rehabilitation.

Improvisation at the piano was utilised by Dvorkin (1982) in the treatment of a 26-year-old schizo-affective female patient. Over a period of eight months, the content and structure of improvisations mirrored her stages of treatment. Improvisations increased in variety of timbre, dynamics and lengthening of melodic line.

Stevens (1983) defines improvisation as 'actual' (the interaction of sounds between client and therapist), and 'symbolic' (music expressing emotions, thoughts and memories). In this context she analyses the use of improvisation to develop relatedness in an adult client diagnosed as schizophrenic.

Cassity (1976) measured changes in peer acceptance, group cohesivness and general interpersonal skills in two groups with different diagnoses, including schizophrenia and neurosis. The experimental group had guitar lessons, while the control group were involved in other activities. A sociogram measured interpersonal interaction. The experimental group made significant gains in peer acceptance and group cohesiveness.

Parente (1989) used songwriting to 'feed the hungry soul . . . in the treatment of anorexia nervosa'. The song lyrics expressed feelings of self-degradation, excessive and self-destructive personality traits, and fear of losing control. Songwriting provided a means for discussing these issues.

Thaut (1989) studied psychiatric prisoners to determine the influence of music therapy interventions on relaxation, affect and thoughts. 130 prisoners were allocated to three groups: (1) music therapy group; (2) instrumental group improvisation; and (3) music and relaxation. Results were not statistically significant between the groups.

Rhythm and tempo in mania has been studied by Cohen (1986), who found that manic patients scored higher on a rhythm task than non-manic patients. Rhythmic abilities may become useful as a diagnostic aid in differentiating manic patients from schizophrenia.

General Hospital Programmes for Physically Ill Adults

Studies have shown the effectiveness of music therapy in treating a wide range of disorders. Cofrancesco (1985) found that the playing of music instruments (tambour, cymbal) helped to increase hand grasp and extension in three patients with left hemiplegia following cerebro-vascular accident (CVA). Christenberry (1979) used singing activities and sedative music to reduce anxiety and pain in patients recovering from burns.

Goloff (1981) surveyed patients in a general hospital to obtain feedback about a music therapy programme which comprised singing and instrumental activities including group improvisation. Questionnaires were completed before and after music therapy. Ratings on physical discomfort (pain) showed a decrease from 15% experiencing a lot of discomfort before music therapy to 9% still experiencing discomfort after music therapy. Subjects rated themselves on change in mood. All six mood states (cheerful, sad, grouchy, lonely, scared, satisfied) improved to the positive. In addition, music therapy was rated as the second most helpful activity during hospitalisation (after visits from family members and friends).

Helen Bonny (1983) studied the effect of taped music programmes on the physiology of patients in intensive coronary care units. 26 patients with chest pain and arrhythmia following heart attacks were studied. Taped music programmes carefully selected as sedative but including a range of styles – jazz, swing, classical, etc. were offered to patients through cassette players and ear jacks. Physiological measurements taken before and after music showed a significant decrease in heart rate. Blood pressure tended to be reduced, although results were not statistically significant. Emotional states showed improvements such as lifted depression, reduced anxiety, increased security, and lowered preoccupation with pain following music experience. Nursing staff reported that the music provided a more pleasant environment.

Physical Disabilities

The effect of Vibro-acoustics (low frequency sound) on people with physical disabilities has been researched by Skille, Wigram and Weekes (1989). The process involves lying the patient on a bed which has four to six built-in loudspeakers. The speakers are attached to a cassette recorder. Sound is transferred to the mattress and the body vibrates according to the sound waves. At 100 Hz, 2% of energy is absorbed by the body. At 40 to 40.5 Hz rhythmical pressure waves cause a synchronisation of nervous impulses through the body including the central nervous system (CNS). Sounds at 40-55 Hz set up a resonant response in the lower lumbar region, pelvis, thighs and

legs. Sounds at 55-88 Hz resonate in the chest and higher frequencies in upper chest, neck and head.

The vibracoustic treatment has proven effective in treatment of arthritic conditions and in relief of pain. Use of low frequency waves should be applied in non-inflammatory periods of arthritis and avoided in the acute phase. The approach has been successfully used in the treatment of sleep disorders and over-use syndromes.

In a study of cerebral palsied patients Skille, Wigram and Weekes (1989) applied two separate frequencies, 40 and 44 Hz, (1) with and (2) without music. There was a greater reduction in tone when low frequency tones were used with music.

Scartelli (1982) studied the effect of sedative music on electro-myography (EMG) biofeedback-assisted relaxation training on people with cerebral palsy (CP). A two-group comparison design placed six CP adults in two groups: (a) EMG feedback relaxation training, and (b) EMG relaxation training with sedative instrumental music background. The first group's muscle tension decreased by 32.5%, and the second group's by 65%.

Terminally Ill

An area of increasing interest for music therapists is that of the terminally ill. Lucanne Bailey (1984) describes her work with cancer patients and their families, where songs were chosen for reminiscence or for ventilation of presenting feelings.

Bailey (1983) has also studied the effects of live music versus taped music on tension-anxiety scales. Results showed that subjects with live music reported less tension-anxiety than those with taped music. There was significantly more positive feedback from live music subjects than those in the taped music conditions.

Gerontology

Various approaches are utilised in music therapy programmes for elderly and confused elderly people.

Reality orientation (RO) and music therapy have been compared by Riegler (1980). Eight elderly people were assigned to a traditional RO programme (discussion based) and eight to music therapy. The experimental group improved markedly in orientation to the environment.

Greenwald and Salzberg (1979) studied the vocal range of geriatric clients. Physical changes accompanying the ageing process affect the vocal singing range. The vocal range of men and women was found to be from G# below middle C to A above middle C. However, published song books and recorded tapes of old songs are often set in unrealistic keys and tempos. The range of pitch of the songs in the 'Sing Along Senior Citizens' Book', for example, range from C# above middle C to C# an octave higher.

D.S. Smith (1989) tested preferred loudness levels of people aged between 18-90 years old. Results showed that subjects in the younger group (18-53 years) with normal hearing preferred a louder volume for listening to music than the 59-90-year-old subjects. Older subjects with deteriorating hearing abilities did not compensate by increasing the volume level.

A further study by D.S. Smith (1988) investigated listening preferences of older adults when music was recorded with enhanced higher frequencies to compensate for presbycusis. Music recorded in the normal range of frequencies constituted Condition A, music with enhanced higher frequencies, Condition B. Subjects spent more time listening to the music with enhanced higher frequencies (Condition B).

Gibbons (1977) studied the music preferences of elderly people to investigate the commonly held belief that the music of their younger years is best liked. The results showed that elderly people strongly prefer popular music of their young adult years. Results also showed a preference for stimulating music over sedative music.

Vanderark, Newman and Bell (1983) studied the effect of music participation on quality of life. Twenty people aged 60 and above were assigned to the experimental group, and 23 to the control group. People were tested on five parametres of quality of life before and after the programme. The experimental group were involved in music sessions comprising singing, learning simple accompaniments, learning rhythmic instruments for use as sound effects during stories and for learning to follow directions. The control group from another nursing home had no music sessions. The experimental group showed significant gains in self-concept, life satisfaction, socialisation, music attitude and music self-concept.

Wylie (1990) compared four stimuli and their effects on the length of time and content of reminiscence in nursing home residents. The residents were assigned to one of four groups: (1) old songs, (2) antique objects, (3) historical summaries, and (4) general questions. Results showed that subjects in groups three and four reminisced for longer periods of time, made more references and statements to places visited, personal events, etc., than those in either the old songs or antique categories. It should be noted, however, that the experience of old songs often leads to a state of reflection. This explains why the length of time and content of reminiscences measured less in group one, although the emotional experience may have been highly significant.

Alzheimer's Disease

A number of studies have measured the effect of music on people with Alzheimer's disease. Patients move through three stages of the disease. In stage one they are able to participate, although memory problems are present. In stage two they present greater confusion. In stage three they have become very frail. Millard and Smith (1989) compared group singing with discussion sessions and found a significant difference between pre- and post-testing for two behaviours: (1) frequency of physical and social behaviour increased in the group singing condition, and (2) the amount of vocal/verbal participation increased in the group singing condition.

G. Smith (1986) explored the effects of differing cueing strategies on the cognitive functioning of Alzheimer's patients. She measured patients' functioning levels on the Mini-Mental Status test and found that musically cued and verbally cued reminiscences significantly increased language sub-scores, but not orientation or attention sub-scores.

Forensic

There is very little evidence in the research literature on forensic music therapy. Nolan (1983) investigated two music therapy approaches, supportive music therapy and insight-orientated guided imagery and music, and found that guided imagery and music aided a depressed prisoner/patient in dealing with conscious and unconscious problems.

Thaut (1989) describes his work with severely mentally ill prisoners and outlines a technique based on personal agenda setting, guided listening to music corresponding to personal agenda, and supportive verbal processing. Thaut identifies the pressing need for psychiatric services within the penal system.

Conclusion

Music therapists need to provide clear evidence for the efficacy of music in therapy. A review of the literature shows the extent to which music therapy enables clients to make significant gains in the development of cognitive, motoric and social skills, in the management of pain and in the experience of emotional growth.

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