

The Effect of Music Therapy on Mood States in Neurological Patients: A Pilot Study

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Music therapy as a clinical intervention has been demonstrated to improve mood states with a variety of populations, however, this has not yet been shown empirically with participants with neurological impairments. This report presents the results of a pilot study examining the effect of music therapy on mood states in patients with acquired and complex neuro-disabilities. Using a single subject design, pre and postsession mood states were measured using the Profile of Mood States (Bipolar form). Analyses examined the main effects of pre/post measures as well as interactions between the specific musical therapeutic intervention, mood state, and diagnosis. Results showed that, in terms of composed-anxious, energetic-tired, and agreeable-hostile mood states, there was a significant difference between pre and post music therapy intervention in a positive direction. Although the study displayed that the benefits of music therapy in treating mood states in this patient group are limited, some of the results were affected by the difficulty of the POMS-BI questionnaire for the subject group. The results are discussed considering methodological improvements and arguing for the inclusion of music therapy as an effective intervention to address negative mood states in neuro-rehabilitation populations.

The authors would like to thank the research participants who took part in this study. The Royal Hospital for Neuro-disability received a proportion of its funding to support this paper from the NHS Executive. The views expressed in this publication are those of the authors and not necessarily those of the NHS Executive. Address all correspondence to Dr. Wendy L. Magee, Music Therapy Department, Royal Hospital for Neuro-disability, West Hill, London SW15 3SW, UK.

Introduction

The effect of music therapy as a clinical intervention to improve mood states is widely reported anecdotally within published clinical case studies, and has also been demonstrated empirically with a variety of populations such as depressed older adults (Hanser & Thompson, 1994) and forensic patients (Thaut, 1989). Within Britain, it is only in comparatively recent years that music therapy has become a clinical intervention in neurological rehabilitation programs. The aim of the current study is to examine whether clinical music therapy facilitates a change in mood states in patients with acquired neuro-disabilities, and to explore possible interactions between mood states, forms of clinical intervention and diagnosis. Existing research in music therapy with this population has tended to focus on functional gains such as gait (Hurt, Rice, McIntosh, & Thaut, 1998; McIntosh, Brown, Rice, & Thaut, 1997; Miller, Thaut, McIntosh, & Rice, 1996; Prassas, Thaut, McIntosh, & Rice, 1997; Thaut, McIntosh, Prassas, & Rice, 1993; Thaut, McIntosh, Rice, Miller, Rathburn, & Brault, 1996; Thaut, Miltner, Lange, Hurt, & Hoemberg, 1999), personal activities of daily living (Gervin, 1991), and speech parameters (Cohen, 1988, 1992; Cohen & Ford, 1995; Cohen & Masse, 1993) rather than on improvements in psychological or social functioning, although it is in these areas that observable changes are consistently reported within the published clinical literature.

One randomized control study examining music therapy with stroke patients produced results approaching statistical significance for improving feelings of depression and anxiety (Purdie, Hamilton, & Baldwin, 1997). Another more recent control group study with individuals with traumatic brain injury and stroke found trends suggesting mood improvements were greater for the treatment group than the control group in self and family ratings (Nayak, Wheeler, Shiflett, & Agnostinelli, 2000). Both of these studies have been important in developing music therapy research which is relevant and valid. Specifically, these studies illustrate the difficulty encountered in measuring changes in psychological states which reach statistical significance as samples of neurological patient groups are small. Furthermore, the difficulty of finding relevant and appropriate measurement systems is highlighted which can be used with communication-impaired populations.

These insights offer some explanations for why research has either been case study and of an anecdotal nature with no comparative function identified, or measured against functions which are easier to quantify, for example gait or speech parameters. Additionally, the use of control designs has presented methodological drawbacks for many reasons. Although randomized controlled trial designs have been considered feasible, participants' strong preference to be included in treatment groups has been stressed as needing consideration. Recommended designs are those which are treatment-specific and population-specific (Purdie et al., 1997). Nayak et al. (2000) also reported problems with random assignment to group studies due to interference with existing treatment regimes.

Given these limitations and issues alongside the need for development of empirical investigation in this area, a pilot study was designed with adults with acquired and complex neuro-disabilities stemming from trauma or disease as participants. Participants were recruited through referrals from a multidisciplinary team on the basis of specified criteria. To minimize the ethical considerations of participant preference, no control group was used, but instead within-subject measures were attained which allowed for an examination of subjective mood states. Both participants' diagnoses and the method of clinical intervention were specified, so that these could be treated as independent variables to examine the extent to which these were contributing factors.

Method

Participants

Fourteen participants with acquired neuro-disabilities were recruited from multidisciplinary referrals at a residential and rehabilitation facility providing care for people with acquired and complex neuro-disabilities. Referrals for the project were generated using prespecified criteria given in the Appendix. To explore whether the interaction of diagnosis and intervention was a contributory factor to results, participants were divided into 3 diagnostic groups of Multiple Sclerosis (MS = 5), traumatic brain injury (TBI = 5) and a mixed group with brain damage from stroke or anoxia (CVA/An = 4). Participants displayed a variety of physical, cognitive, communication, sensory, and behavioral impairments. A mental state questionnaire used in an earlier pilot study of music

therapy with neurological patients was administered to participants to gauge memory functions and orientation (Purdie et al., 1997). All participants could communicate verbally through speech or augmentative communication aids. Written consent was obtained from the participants themselves in the presence of a witness.

Materials

A single subject design compared pre and postsession measurements of mood using the Bipolar form of the Profile of Mood States (POMS-BI; Lorr & McNair, 1988). The POMS-BI is a classic test used to examine mood states and feelings in normals and in psychiatric outpatients, its principal use being "to assess mood change resulting from such techniques as relaxation therapy, meditative treatment, and brief and longterm psychotherapies" (Lorr & McNair, 1988, p. 3). Both negative and positive effects of applied conditions are measured. Bipolar subjective mood states are measured, each of 6 subscale mood states defined by a subset consisting of 12 adjectives or phrases appearing in a cyclical order. Due to severe level and complex combination of physical, communication and cognitive disabilities presenting in the population under investigation, it was necessary to reduce the number of items on the POMS-BI scale from 72 items to 48 items, covering only 4 of the possible 6 subscales. This was in order to reduce the combined effects of measurement time and the types of cognitive deficits specified (impaired memory, attention, and concentration spans) on accuracy of results. The four mood state categories selected were a consistent selection made by three independent assessors from differing theoretical backgrounds as most likely to be affected by music therapy intervention. These mood states were: composed—*anxious*; agreeable—*hostile*; elated—*depressed*; and energetic—*tired*. An independent tester administered the test, as participants were not able to complete the test independently. This took place for both sessions immediately pre and postsession. Measurement packs were supplied with written instructions to ensure consistency in administration. Independent testers were either psychologists or music therapists who were blind to the particular clinical technique being used.

Procedure

Participants each attended one individual music therapy session per week over a period of 2 weeks. Sessions followed a prespecified

format, including 'welcome' and 'ending' musical activities to frame the session. The main activity differed between the two sessions, involving either the use of precomposed songs using the method of "song-choice" (Bailey, 1984) or clinical improvisation methods involving unfamiliar spontaneous music generated in co-improvisations with the therapist (Bruscia, 1987). The music improvised may have been tonal, based in major, minor or pentatonic tonalities, atonal or unpitched. The tonality of the improvisation depended on the participant's chosen instrumentation and musical utterances. Song-choice was used in one session, and clinical improvisation in the other, with participants being randomly assigned to the order of treatment methods.

Results

Results showed that there were significant differences in positive directions for composed-anxious, energetic-tired and agreeable-hostile mood states after music therapy intervention.

Possible differences in mood states of the participants were examined in an analysis of variance with repeated measures in a mixed design (pre/post by treatment condition by diagnostic group). Analyses were carried out on each of the mood subscales selected from the POMS-BI: agreeable-hostile, composed-anxious, energetic-tired and elated-depressed. These examined the main effects of pre/post measures, music therapy condition, and diagnostic group, in addition to the two way interactions between each of these and the three way interaction overall.

Significant main effects of pre/post measures were found for the mood states composed-anxious, $F(1,11) = 9.61$, $p = 0.01$, energetic-tired, $F(1,11) = 4.6$, $p = 0.05$, and agreeable-hostile mood states, $F(1,11) = 13.8$, $p = 0.003$. No significant main effects were found for the interaction between music therapy condition and pre/post mood measures. An examination of the mean scores pre and postsession (see Table 1) indicated that changes in mood states were consistently in a positive direction, suggesting that music therapy intervention resulted in feelings which were more towards 'composed,' 'energetic,' and 'agreeable' mood states after music therapy sessions.

No significant results were found for either main effects or interactions for the mood subscale elated-depressed. There were no statistically significant results found for the interactions between

TABLE 1

Mean Scores of Pre and Postsession Mood Scores for Each Mood Substate and Each Condition

	Pre-session	Postsession
Composed–anxious		
Clinical improvisation	28.3	31.35
Songs	28.1	30.9
Agreeable–hostile		
Clinical improvisation	30.6	33.4
Songs	32.0	33.8
Energetic–tired		
Clinical improvisation	23.9	24.4
Songs	20.9	25.9
Elated–depressed		
Clinical improvisation	25.0	26.3
Songs	25.2	29.1

pre/post measures and group, or for the three-way interaction between group, condition and pre/post measures.

Discussion

The significant positive changes found in the mood states composed–anxious, energetic–tired, and agreeable–hostile after music therapy intervention are important when considering the reality for patients who have acquired severe and complex neuro-disabilities. The decreased levels of physical ability, spontaneous communication, independence, control, and comfort that result from acquired neuro-disability all place the patient at risk of fluctuating mood states.

It is important to note that these significant changes were found after a brief intervention. This finding is pertinent in the light of current health care which emphasizes cost effective interventions during short-term admission to rehabilitation programs. Promoting positive mood change and motivating the patient to participate in rehabilitation is often a challenge for the clinician in this setting. Indeed, the results provide evidence of clinical effectiveness over much shorter time spans than those previously reported (see Purdie et al., 1997, where therapy duration is up to six times longer than that reported here). However, possible differences between short term and longer term intervention should be explored in future studies, particularly with regard to the impact on elated–depressed

mood states which commonly are reported in the anecdotal literature as improving after longer term music therapy intervention.

Here it is necessary to discuss the finding that the subscale 'elated-depressed' was not found significantly altered after the short-term music therapy intervention. One interpretation might be to raise questions about which aspects of mood music therapy actually affects. The result could suggest that the other three scales are more representative of the emotional changes experienced in short-term therapy. If this were found to be the case, it might imply that using music therapy as a short-term intervention to lift low moods might be misguided, since feelings of depression were not significantly affected.

On the other hand, however, it is feasible that for some reason peculiar to this client group, the bipolar scale was less salient or effective to describe their mood states. Clearly, a replication of the study would be necessary to determine the overall validity of the measures employed.

The results were not able to link mood change to particular therapy techniques, suggesting that type of therapy may not be the critical determinant in mood change. A replication of the study would be necessary to confirm the findings. However, influential trends in music therapy research stress the analysis of musical or verbal data employing qualitative paradigms as the most informed way to answer clinical questions, and in line with these trends, the qualitative observations collected as additional data in this study revealed more explicit information to help explain differences between the music therapy conditions. Such data included verbal statements, individuals' engagement during each music therapy activity, and immediate responses such as changes in body posture or facial gestures. For example, one participant spontaneously said 'Wonderful!' after participating in an improvisation, although his POMS-BI mood scores were shown to be lower after the session than before. Qualitative data from this same participant in the song session alluded to how songs which had previously held importance for him had taken on a new meaning since becoming disabled. His mood scores were higher after the song session, despite being moved to tears by the songs which he had chosen to use in the session. Analysis of this type of data would have offered greater depth and clarity concerning differences between clinical techniques and the underlying processes taking place. In particu-

lar, emotional responses to song-based techniques were more spontaneous and given greater definition by participants than to improvisation techniques, in response to which qualitative data revealed concerns highlighting feelings of lack of skill and physical difficulty. In particular, the MS group's mean scores show differences between different types of intervention for certain mood subscales. Although not reflected statistically, the MS group's results suggest that a variable other than mood may have existed for this particular group between the two activities. This was supported in the qualitative data collected and therefore warrants further examination.

Conclusions

A small-scale exploratory study has shown that music therapy is an effective short-term clinical intervention, facilitating a positive change in mood states in adults living with chronic neuro-disability. However, an interaction between specific clinical technique and mood change was not established using the current methodology, although additional qualitative data collected highlighted considerable differences between clinical interventions. The fruitful findings certainly warrant further investigation. In light of the current data, it seems imperative that qualitative methodologies which encourage individual differences to emerge are developed as well as exploring data from standardized measures.

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Appendix

Criteria for Referral

1. Acquired severe neurological disability stemming from brain damage caused by traumatic or anoxic brain injury, Multiple Sclerosis or stroke.
2. Resident for rehabilitation or residential care at the facility at the time of data collection.
3. Evidence of music having a significant meaning in their lives (e.g., background in music associated activities; being an avid listener of music).
4. No evidence of inappropriate affect or labile behavior caused by brain damage, which would render mood scores invalid.
5. Were not limited by physical ability to play musical instruments involved in the improvisation activities (e.g., lightweight percussion instruments which could be held in one hand, instruments played with lightweight beaters, strumming instruments, lightweight wind instruments).
6. Were able to communicate verbally using speech or augmentative communication aids.
7. Demonstrated orientation and memory abilities through minimum score of 7 or above on the Aberdeen Mental State Questionnaire (Purdie et al., 1997).
8. Agreed to be included in the study, by giving written consent.