AOTA Evidence Briefs
Parkinson's Disease

**A product of the American Occupational Therapy Association's Evidence-Based Literature Review Project*

P #11

Music therapy may improve physical and psychological functioning in people with Parkinson's disease.

Pacchetti, C., Mancini, F., Aglieri, R., Fundarò, C., Martignoni, E., & Nappi, G. (2000). Active music therapy in Parkinson's disease: An integrative method for motor and emotional rehabilitation. *Psychosomatic Medicine*, *62*, 386–393.

Level: IB3b

Randomized controlled trial, 2 groups, fewer than 20 participants per condition, low internal validity, moderate external validity.

Why research this topic?

There has been little research on the use of music therapy in medical care. However, the available studies of its effectiveness in that context suggest many emotional and physical benefits. Given the nature of Parkinson's disease as a movement disorder and a disorder in which mood changes are a major component, music therapy might be an appropriate treatment.

What did the researchers do?

Pacchetti et al. (2000), all affiliated with the University of Pavia (Italy), designed a study to test the effectiveness of music therapy on motor involvement in patients with Parkinson's disease and to compare the results of music therapy with those of physical therapy.

The participants in the study were 32 outpatients with Parkinson's disease. To be eligible, they had to have the "idiopathic" variety of the disease (i.e., the kind that occurs spontaneously, of an unknown cause) and be responsive to levodopa therapy or other dopaminergic treatments (standard therapies in Parkinson's disease). They were "stable responders or early fluctuators to levodopa," in stage 2 or 3 of Parkinson's disease, and "not affected by cognitive deterioration, severe sensory (visual or auditory) deficits, or diseases affecting movement" (p. 387). Twenty-three were men, and nine were women. The average age was 62.9 years.

The researchers randomly assigned the participants to a music therapy group (n=16) or a physical therapy group (n=16). The groups were similar on important variables such as age, severity of illness, and motor impairment.

The music therapy group, divided into two groups of eight, participated in 13 weekly sessions, each about two hours long. They received "active" music therapy, which involves

> improvisation of music by the therapist and patients, who play an active part by using instruments and voice. The use of instruments is structured to involve all the sensory organs; the rhythmic and melodic components of music may be used as specific stimuli to obtain certain motor and emotional responses, thus combining movement and stimulation of different sensory pathways…with a well-established emotional quality (pp. 386–387).

> A standard session included
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> entrance and interview, 10 minutes; listening to relaxing music and visualization of images, 10 minutes; choral singing and facial expression, breathing, and voice exercises, 15 to 20 minutes; rhythmic movements (e.g., involving lower limbs, upper limbs, and gait), 30 minutes; active music involving collective invention and improvisation, 30 to 40 minutes; free body expression to melodic and rhythmic music, 20 to 30 minutes; and conversation, 10 minutes (p. 388).

The participants performed exercises as couples, as small groups, or as a whole group.

The physical therapy group, also divided into two groups of eight, attended 13 weekly sessions lasting about 1.5 hours each. Their therapy consisted of "a series of passive muscle stretching exercises for rigidity and joint mobility, specific motor tasks for hypokinesia [reduced muscular activity], weight shifting and balance training for posture, plus movement strategies to prevent falls and to initiate and maintain gait" (pp. 387–388). The participants performed the exercises individually.

The outcome measures of interest to the researchers were *"bradykinesia"* (slowness of movement), *rigidity*, *resting tremor*, and *postural tremor* (as measured by the Motor subscale of the Unified Parkinson's Disease Rating Scale [UPDRS]); *emotional state* (as measured by part 1 and the combination score [parts 1 and 2] of the Happiness Measure [HM]); *quality of life* (as measured by the Parkinson's Disease Quality of Life Questionnaire [PDQL]); and *activities of daily living* (ADL; as measured by the ADL subscale of the UPDRS). Measures on the Motor subscale of the UPDRS and part 1 of the HM were taken before the intervention; before and after each session in weeks 1, 3, 5, 7, 9, and 11 of the intervention; and 2 months after the intervention. Measures on the combination score of the HM were taken before the intervention; before and after each session in weeks 1, 5, and 9 of the intervention; and 2 months after the intervention. Measures on the PDQL and the ADL subscale of the UPDRS were taken before the intervention; before and after each session in weeks 1, 7, and 11; and 2 months after the intervention.

What did the researchers find?

On the Motor subscale of the UPDRS, at all testing points during the intervention, the music therapy group improved **significantly** (see *Glossary*) from before the session to after the session in overall score and on the **bradykinesia** (see *Glossary*) component. The physical therapy group improved significantly on the rigidity component. None of these effects were present at the two-month follow-up, however.

At each testing point during the intervention, the music therapy group improved significantly more than the physical therapy group in overall score and on the bradykinesia component. The physical therapy group improved significantly more than the music therapy group on the rigidity component.

On part 1 and in the combination score of the HM, at all testing points during the intervention, the music therapy group improved significantly from before the session to after the session. Again, though, the effect was not present at the two-month follow-up. The physical therapy group did **not** show any **significant** (see *Glossary*) changes.

At each testing point during the intervention, the music therapy group improved significantly more than the physical therapy group on the happiness measures.

On the ADL subscale of the UPDRS, at weeks 7 and 11 of the intervention, the music therapy group had improved significantly more than the physical therapy group in total score. Also, the music therapy group showed significant improvement on four individual items of the subscale: improvements in cutting food, dressing, reductions in falling, and freezing. Also, at the end of the study, the music therapy group showed significant improvement overall. The advantage was not present at the two-month follow-up, however.

On the PDQL, at weeks 7 and 11 of the intervention, the music therapy group had improved significantly more than the physical therapy group. Also, at the end of the study, the music therapy group showed significant improvement overall. Again, though, the advantage was not present at the two-month follow-up.

What do the findings mean?

For therapists and other providers, the findings suggest that active music therapy can improve motor ability (particularly bradykinesia), emotional well-being, performance of ADL, and quality of life in people with Parkinson's disease.

What are the study's limitations?

In comparing the two groups, the researchers did not "control" (experimentally adjust) for the effects of baseline **demographic** (see *Glossary*) variables or the levadopa medication.

Glossary

bradykinesia—"Extreme slowness of movements and reflexes" (Merriam-Webster's Medical Dictionary, s.v.).

demographic—Relating to humans in general.

nonsignificant (or no significance)—A statistical term that refers to study findings that are likely to be due to chance differences between the groups rather than to other factors (e.g., the treatment of interest). A nonsignificant result cannot be generalized outside the study. Like significance, a nonsignificant result does not indicate the clinical effect. Often studies will show nonsignificant results, yet the treatment group's mean will be better than the control group's. This is usually referred to as a trend in the right direction. Because significance is closely determined by sample size, nonsignificant results would often become significant if the sample size were increased.

significance (or significant)—A statistical term that refers to the probability that the results obtained in the study are not due to chance, but to some other factor (e.g., the treatment of interest). A significant result is likely to be able to be generalized to populations outside the study.

Significance should not be confused with *clinical effect*. A study can be statistically significant without having a very large clinical effect on the sample. For example, a study that examines the effect of a treatment on a client's ability to walk may report that the participants in the treatment group were able to walk significantly longer distances than those in the control group. However, after reading the study one may find that the treatment group was able to walk, on average, 6 feet, whereas the control group was able to walk, on average, 5 feet. Although the outcome may be statistically significant, a clinician may not feel that a 1-foot increase will make his or her client functional.

This work is based on the evidence-based literature review completed by Vidyalakshmi Sundar, BS, and Marian Arbesman, PhD, OTR/L.

For more information about the Evidence-Based Literature Review Project, contact the Practice Department at the American Occupational Therapy Association, 301-652-6611, x 2040.

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