AOTA Evidence Briefs
Stroke

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

S #17

Enjoyable activities may be more effective than traditional motor function exercises in improving stroke clients' physical ability and psychosocial well-being

Smedley, R. R., Smedley, W. P., Aronica, M. J., Fiorino, A. J., Soucar, E., & Reynolds, D. (1986). Slot machines: Their use in rehabilitation after stroke. *Archives of Physical Medicine and Rehabilitation, 67,* 546–549.

Level IIB3b

Nonrandomized comparison of two or more groups or treatments in a quasi-experiment without randomization to group, condition, or sequence; 20 or more participants per condition or group; low internal validity; moderate external validity

Why research this topic?

Traditional exercises to improve motor skills often are monotonous and boring. A novel, entertaining, and purposeful activity might offer clients more motivation to continue therapy, which might result in greater therapeutic benefit.

What did the researchers do?

Smedley and colleagues (1986), variously of Temple University (Philadelphia), of Allied Services for the Handicapped (Scranton, Pennsylvania), and in private practice investigated the effects of operating an adapted slot machine on stroke clients' motor function and psychological well-being.

In the study, the researchers adapted slot machines to operate with ordinary washers instead of coins and to allow graded resistive exercises that accomplished the same muscle-strengthening goals as traditional therapeutic devices. The experimental group operated the machines as therapy. Both the experimental and the control group performed the tasks and the activities commonly used by therapists to improve **sensorimotor** (*see Glossary*) functioning, involving guided motion and devices such as pulleys, peg boards, and shoulder bars.

The participants were 50 inpatients (gender not reported) from two rehabilitation hospitals, who ranged in age from 40 to 84 years. Inpatients from one hospital constituted the experimental group, inpatients from the other hospital the control group. The two hospitals were identical in size, staff, policies, and procedures. Occupational therapists delivered the interventions.

The researchers were interested in two outcome areas: *physical ability* (as indicated by range of motion, muscle strength, and gross and fine motor coordination); and *psychosocial well-being* (how the participants were faring psychologically and socially, as measured by the Beck Depression Inventory).

What did the researchers find?

The experimental group improved **significantly** (*see Glossary*) more than the control group on both measures.

What do the findings mean?

For therapists and other providers, the findings suggest that a novel and entertaining intervention like operating slot machines may be more effective than traditional motor function exercises in improving stroke clients' physical ability and psychosocial well-being.

What are the study's limitations?

First, the process used to select the participants may have influenced the results. That is, the experimental group came from one facility, the control group from the other. These groups would—at the least—have different histories. "History is a threat [to internal validity] when an observed effect might be due to an event (or events) which takes place between the pretest and the posttest when this event is not the treatment of research interest" (Cook & Campbell, 1979, p. 51).

Second, the experimental group received greater amounts of therapy than the control group.

Third, the therapists who delivered the interventions may have known the study's hypothesis and unintentionally influenced the results.

Fourth, the participants probably were still in the acute stage of their stroke, a time when spontaneous recovery occurs with or without therapy. This phenomenon could have accounted for the improvement seen in 90% of all the participants.

Reference

Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis issues for field settings.* Boston: Houghton Mifflin.

Glossary

sensorimotor—"of, relating to, or functioning in both sensory and motor aspects of bodily activity" (*Merriam Webster's Collegiate Dictionary,* 10th ed., p. 1066)

significance (or significant)—A statistical term, this refers to the probability that the results obtained in the study are not due to chance, but to some other factor (such as the treatment of interest). A significant result is one that is likely to be generalizable 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 the control. However, if you read the study you may find that the treatment group was able to walk , on average, six feet, while the control group was able to walk, on average, five feet. While the outcome may be statistically significant, a clinician may not feel that a one foot increase will make his or her client functional.

■ Terminology used in this document is based on two systems of classification current at the time the evidence-based literature reviews were completed: *Uniform Terminology for Occupational Therapy Practice—Third Edition* (AOTA, 1994) and *International Classification of Functioning, Disability and Health (ICIDH-2)* (World Health Organization [WHO], 1999). More recently, the *Uniform Terminology* document was replaced by *Occupational Therapy Practice Framework: Domain and Process* (AOTA, 2002), and modifications to *ICIDH-2* were finalized in the *International Classification of Functioning, Disability and Health* (WHO, 2001).

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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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