



AOTA Evidence Briefs

Cerebral Palsy

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

CP #6

Oral-motor therapy can produce limited improvement in children with cerebral palsy who have moderate eating difficulty

Gisel, E. G. (1994). Oral-motor skills following sensorimotor intervention in the moderately eating-impaired child with cerebral palsy. *Dysphagia*, 9, 180–192.

Level: IB1a

Randomized controlled trial, less than 20 participants per condition, high internal validity, high external validity

Why research this topic?

Children with severe cerebral palsy often have difficulty eating. The result may be malnutrition and retarded growth.

What did the researcher do?

Gisel (1994), of McGill University (Montreal), designed a study to evaluate the effects of oral **sensorimotor** (see *Glossary*) therapy on oral-motor skills and growth in children with cerebral palsy and moderate eating difficulty. She recruited 35 children (19 boys and 16 girls) from three special schools in Montreal between January 1990 and December 1991. They ranged in age from 4.3 to 13.3 years. The researcher randomly assigned them to one of three groups: sensorimotor treatment (11 children, whose average age was 6.3 years); chewing-only treatment (12 children, whose average age was 7.3 years); and control (12 children, whose average age was 7.7 years). One child from the sensorimotor group died during the study, from causes unrelated to it.

The sensorimotor group received individualized treatment based on an assessment. The treatment took place before lunch for 5–7 minutes, 5 days a week for 20 weeks. It emphasized tongue lateralization (using the tongue to retrieve food placed on alternate sides of the tongue, then of the cheek pockets, then of the lips), lip control (as in blowing and sucking), and vigor of chewing (chewing biscuits of progressively greater hardness).

The chewing-only group also received treatment before lunch, with the same frequency and for the same duration as the sensorimotor group. Group members' task was to chew various items, beginning with small pieces of fruit gelatin and progressing to hard biscuits.

The **control group** (see *Glossary*) members followed their school's routine of feeding for 10 weeks, then received the same kind of sensorimotor treatment as the sensorimotor group did, for 10 weeks.

The outcome areas of interest were *eating skills* (as measured by the Functional Feeding Assessment subtest of the Multiple Feeding Profile, with adjustments in scoring) and *weight* and *skinfold thickness*. The feeding assessment consists of 13 domains. There are seven main categories: spoon feeding, biting, chewing, cup drinking, straw drinking, swallowing, and clearing. The first six have two subcategories, abnormal and normal. The seventh has no abnormal subcategory. An observer rates a child's behavior in each domain except clearing as normal or abnormal, then scores the behavior according to its functional adequacy.

What did the researcher find?

On the measure of eating skills, for all three groups together, competence in biting (abnormal) and chewing (normal) improved **significantly** (see *Glossary*) after 20 weeks. The improvement in competence in spoon feeding (normal) nearly achieved significance.

Individual groups also showed significant or near-significant improvements: the sensorimotor group in spoon feeding (normal) at 20 weeks, the control group in spoon feeding (abnormal) and chewing (normal) at 20 weeks, and the chewing-only group in chewing (normal) at 10 weeks.

There were **no significant** (see *Glossary*) differences among the groups, however.

On the weight measure, members of the sensorimotor group gained weight during the first 10 weeks but had lost weight to below their beginning value after 20 weeks. The chewing-only group exhibited similar changes. The control group gained weight during both 10-week periods.

On the measure of skinfold thickness, the groups generally showed increases across the 20 weeks. (The sensorimotor group showed a reduction on one measure after 10 weeks, but increases otherwise.)

What do the findings mean?

- The findings suggest that oral-motor therapy can produce limited improvement in the eating skills, but not the drinking skills, of children with cerebral palsy who have moderate eating impairments. Also, it can produce some weight gain but not enough for the children to catch up with their healthy peers.
- The findings should boost confidence in oral-motor therapy for children with cerebral palsy who have moderate eating impairments.

What are the study's limitations?

- Subjects from three schools in one metropolitan area.
- No analysis of group differences (on demographic data) following random assignment to treatment groups to determine if groups were equal at baseline.
- Person completing assessments was not **blinded** (see *Glossary*) to the child's treatment group assignment.
- No power calculations reported.

GLOSSARY

blinded—Blinding refers to the practice of keeping members of the research study unaware of which group a participant is assigned to (treatment or control) in the study. Single blinding usually refers to keeping study participants unaware of whether they are receiving the experimental or the sham treatment. Double blinding usually refers to keeping the participants and those who are administering the treatment unaware of who is receiving the experimental and who is receiving the sham treatments. In some cases, where it is impossible to blind those administering treatment, the individuals who are administering the outcome measures can be blinded to group status.

Studies in which blinding does not occur can have significant biases. When the participants know that they are receiving the experimental treatment, they often get better because they think they ought to (this is often referred to as the placebo effect). When researchers know that a participant is receiving the experimental treatment, they often subconsciously favor those participants when evaluating them on outcome measures. For instance, when timing a participant in the treatment group, researchers may unknowingly stop the watch a little faster or slower so the treatment participant seems to do better.

control group—A group that received special attention similar to that which the treatment group received, but did not receive the treatment.

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 (like the treatment of interest). A nonsignificant result is not generalizable 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.

sensorimotor—Of, relating to, or functioning in both sensory and motor aspects of bodily activity.

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 (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, 6 feet, while the control group was able to walk, on average, 5 feet. While the outcome may be statistically significant, a clinician may not feel that a 1-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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