AOTA Evidence Briefs

Children With Behavioral and Psychosocial Needs

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

PSYCH 16

Elementary school children can learn principles of back care and use them for at least a year

Cardon, G. M., De Clercq, D. L. R., & De Bourdeaudhuij, I. M. M. (2002). Back education efficacy in elementary schoolchildren: A 1-year follow-up study. *Spine*, *27*, 299–305.

Level: IIA2b

Nonrandomized controlled trial, 2 groups, 20 or more participants per condition, moderate internal validity, moderate external validity.

Why research this topic?

Numerous studies report the increasing prevalence of back pain in children. Thus, back education in elementary schools makes sense. However, only a few such programs have been developed and evaluated, and the results have been mixed. The limited scope of some programs (e.g., addressing only one or two aspects of back care) and methodological problems with the studies (e.g., too brief an intervention) may account for the programs' apparent lack of success.

What did the researchers do?

Cardon, De Clercq, and De Bourdeaudhuij (2002), all affiliated with Ghent University (Belgium), designed a study to investigate the efficacy of a six-week back education program for elementary school children.

The study took place in public schools with similar curricula. The participants were fourth- and fifth-grade children between 9 and 12 years of age. The researchers constituted three experimental groups by randomly selecting whole classes from 20 fourth- and fifth-grade classes in schools teaching the back education program. Experimental group 1, consisting of 198 children, took a practical test. Experimental group 2, consisting of 347 children (the original 198 plus 149), responded to a questionnaire. Experimental group 3, consisting of 38 children (two experimental class groups in schools where the gym was available during playtime), was evaluated by candid camera (not explained; presumably a video camera). The researchers constituted three **control groups** (see *Glossary*) in a similar way from 18 fourth- and fifth-grade classes in three comparable schools. The numbers in these groups were 165, 349, and 31, respectively. From the test before the intervention to the test one year after, 42 children dropped out of the two practical-test groups, and 67 dropped out of the two questionnaire groups.

Across the 6 groups, the average age ranged from 9.8 to 10.3 years, and the proportions of boys and girls ranged from 47.5% and 52.5%, to 67.6% and 32.4%.

The long-term goal of the back education program was to teach the children good body mechanics and correct posture while performing various tasks. Based on the literature on biomechanics and the German Back School, it consisted of 6 weekly sessions, each 60 minutes long and taught to 1 class at a time. The sessions made use of 10 guidelines: "1) Always keep the natural curves of your back, 2) be active, join in sports, 3) place your book on a ring binder or inclined desk, 4) when you relax, lie down on your back with your legs raised, 5) bend your knees, not your back, 6) to lift, stand as close as possible to the object, 7) ask for help in lifting a heavy object, 8) carry an object as close

as possible to your body, 9) carry your book bag on your back, and 10) your book bag should not weigh more than one tenth of your body weight" (p. 301). A physical therapist taught the sessions using guided discovery and active hands-on methods. To facilitate integration of the principles into the classroom, the researcher asked the class teachers to attend all the sessions and organized an information session for the teachers and the parents (p. 301).

The practical test administered to the experimental and control groups consisted of five general tasks: taking off shoes, sitting, handling and moving a crate, picking up a light object, and using a book bag. On some tasks, testers rated several items. For example, on moving a crate, they rated posture, no twisting, and position of the load.

The questionnaire addressed "week prevalence" of back and neck pain, defined as "the occurrence of pain or discomfort, continuous or recurring, at some point in the past week" (p. 301). The researchers scored severity of pain on a 5-point scale and frequency of pain on a 4-point scale. The respondents indicated the location of the pain on a body chart.

The evaluation by candid camera had two parts: observation in the classroom during a regular lesson, to evaluate sitting posture and use of a ring binder; and observation of a movement session. During the movement session, researchers evaluated the children on posture while taking off their shoes, sitting posture, use of a ring binder, back position while lifting, bending while lifting, posture while putting down a heavy object (a bench), posture while picking up a light object (a badminton shuttle), and posture while moving a heavy object (a medicine ball).

Outcome areas of interest were the *various postures* for which evaluators watched (on the practical test and on candid camera) and *prevalence of back and neck pain* (as reported by the children on the questionnaire). The practical test and the questionnaire were administered 1 week before the intervention, 1 week after the intervention, 3 months after the intervention, and 1 year after the intervention. The candid camera evaluation was performed 1 day before the last practical test (1 year after the intervention).

What did the researchers find?

On the practical test administered before the intervention, the control group scored **significantly** (see *Glossary*) higher than the experimental group on all the items except posture while moving a crate, and on the total score. At the three subsequent testing points, the experimental group scored significantly higher than the control group on all the items and on the total score. Across both groups there was a significant effect of time on two items, posture while taking off shoes and sitting posture. The scores on these two items decreased from the test one week after the intervention to the test one year after the intervention.

The questionnaire revealed a significant interaction between time and condition. That is, the experimental group experienced a decrease in prevalence of back and neck pain from the test before the intervention to the test one year after it, whereas the control group experienced an increase during the same period.

Across the whole group, between 32% and 43% reported pain localized to the cervical area, 20–30% reported pain in the upper back, 15–21% reported pain localized to the lumbar area, and approximately 20% reported pain in a combination of areas. Between 64% and 72% of the total group reported some pain (from very minimal to very severe) during the past week, with 1–4% of group reporting very severe pain. While nearly 40% reported one moment of pain during the past week, constant pain was reported by between 2.5% and 3.7% of the participants.

On the candid camera evaluation, the experimental group scored significantly higher than the control group on four of the eight items: back position while lifting, bending while lifting, posture while putting down a heavy object, and posture while moving a heavy object. The experimental group also scored significantly higher on the total score.

What do the findings mean?

For therapists and other providers, the findings indicate that schoolchildren can learn principles of back care and follow-through will take place for at least a year. Also, the findings suggest that back education has a role in reducing the prevalence of back and neck pain for up to one year. Appropriate care of one's back is an important health-related behavior. The ability to follow the directions needed to participate in this IADL is also a significant component of the psychosocial needs of children and adolescents.

What are the study's limitations?

The study has two limitations. Although the groups were randomly selected, the participants were not randomly assigned. In addition, a self-report questionnaire was used to assess severity and location of pain.

Glossary

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

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 Shari Nudelman, OTR/L, 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.