CRITICALLY APPRAISED PAPER (CAP)

FOCUSED QUESTION
Are school-based consultation services effective in improving occupational performance in children with fine motor difficulties?

What characteristics of teachers support the ability of school-based consultation services to improve occupational performance in children with fine motor difficulties?


CLINICAL BOTTOM LINE:
This paper provides some evidence for the effectiveness of school-based occupational therapy consultation for students with fine motor difficulties, and underlines the importance of teacher awareness of a student’s problems and implementation of OT recommendations for improving a student’s performance. However, outcomes were subjective and may not have reached clinical significance.

Occupational therapy school-based consultation (OTSBC) services were provided to regular and special education teachers, teaching assistants, and families and caregivers of children in Grades K–5 with fine motor difficulties. Canadian Occupational Performance Measure (COPM) performance and satisfaction scores, as reported by teachers, showed statistically significant improvement over the course of 1 year, but the magnitude of the improvement may or may not be clinically significant. Improvement was greatest in those whose baseline scores were lowest, and increased teacher awareness and implementation of occupational therapy recommendations correlated with greater improvement on the COPM. Results may have been affected by measurement bias, as those teachers who were participating in the intervention and whose awareness and implementation were being evaluated were also the ones completing the COPM.

RESEARCH OBJECTIVE(S)
List study objectives.

- Identify and describe current functional problems of students referred for OTSBC services for fine motor problems and measure changes in functional abilities after service delivery.
- Identify factors that influence outcomes of OTSBC from multiple perspectives, including
teachers, service funders, occupational therapists, students, and parents.

- Determine how satisfied the teachers of these students are regarding the OTSBC service delivery process.

**DESIGN TYPE AND LEVEL OF EVIDENCE:**

<table>
<thead>
<tr>
<th>DESIGN TYPE</th>
<th>LEVEL OF EVIDENCE</th>
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<tbody>
<tr>
<td>Pretest–posttest</td>
<td>Level III</td>
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Limitations (appropriateness of study design):

Was the study design type appropriate for the knowledge level about this topic? *Circle yes or no, and if no, explain.*

**YES/NO** This study lacks a control group. Additionally, one of the outcome measures used, the Teacher Awareness Scale (TAS), was developed for the study and was evaluated only for test–retest reliability, and not for other psychometric properties.

**SAMPLE SELECTION**

How were subjects selected to participate? Please describe.

Stratified sampling of School Health Support Services referrals to 6 Community Care Access Centers (CCACs) in Toronto, Ontario, Canada reflected the population size of the CCACs.

**Inclusion Criteria**

- Students in Grades K–5 referred to Community Occupational Therapy Associates Health.
- Primary referral diagnosis of fine motor delay, fine motor deficit, fine and gross motor delay, or fine and gross motor deficit.
- Parental consent.

**Exclusion Criteria**

- Referral for short-term services (e.g. anticipated transfer to another school, equipment prescription) or assessment only.
- Referral with a diagnosis of pervasive developmental disorder, physical disability, or developmental delay in addition to fine motor problems.
- The COPM was not completed within the first 4 visits due to logistical reasons.

**SAMPLE CHARACTERISTICS**

\[N = 91\]

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<table>
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<tbody>
<tr>
<td>% Dropouts</td>
<td>0</td>
</tr>
<tr>
<td>#/ (%) Male</td>
<td>70 (77%)</td>
</tr>
<tr>
<td>#/ (%) Female</td>
<td>21 (23%)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>NR</td>
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</table>
Disease/disability diagnosis: Fine motor delay, fine motor deficit, fine and gross motor delay, fine and gross motor deficit.

Check appropriate group:

<table>
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<th>Group</th>
<th>Value</th>
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<td>51–100/study group</td>
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<tr>
<td>101–149/study group</td>
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<td>150–200/study group</td>
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**INTERVENTION(S) AND CONTROL GROUPS**

*Add groups, if necessary.*

**Group 1**

**Brief Description**

School-based consultation services included providing education to 89% of children’s key school personnel (i.e., teacher, special education teacher), 26% of other school personnel (i.e., teaching assistants), and 65% of parents or caregivers involved with the student. Occupational therapists educated teachers in the use of specialized approaches, such as multisensory and biomechanical or postural approaches, how to carry out task analyses of fine motor tasks, and how to use alternative written communication. Occupational therapists recommended resources, modifications, and strategies.

**Setting**

Public elementary schools (74%) and separate schools (24%) in Toronto.

**Who Delivered?**

31 occupational therapists.

**Frequency?**

2–18 visits during the year; mean 13 for students who were still receiving services at the end of the year and 12 for students who were discharged before the end of the school term.

**Duration?**

Mean: 150 days; SD: 59 days

**Intervention Biases:** *Circle yes or no and explain, if needed.*

Contamination

**YES/NO**

Co-intervention

**YES/NO** The students were educated in a Grade K–5 school setting in which fine motor abilities are generally fostered and developed through educational activities for all students, regardless of occupational therapy involvement.

Timing

**YES/NO** Gains may be influenced by maturation over a mean duration of approximately 5 months.

Site

**YES/NO**
Use of different therapists to provide intervention

YES/NO

MEASURES AND OUTCOMES
Complete for each relevant measure when answering the evidence-based question:
Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article—yes/no/NR [not reported]), and how frequently the measure was used.

COPM performance and satisfaction scales were used to identify problem areas and measure performance changes. Good test-retest reliability and content validity; evidence of criterion and construct validity and responsiveness. Filled out by teacher pre- and post-intervention.

Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article—yes/no/NR [not reported]), and how frequently the measure was used.

The TAS was used to assess the degree of teacher awareness of each student’s problems and the degree of teacher implementation of the strategies recommended by the occupational therapist. There were two subscales: (1) Teacher Awareness (TA) and (2) Teacher Implementation (TI). The occupational therapists rated the TA subscale pre- and postintervention, and the TI subscale postintervention. Test–retest reliability of initial TA subscale = .90, reassessment TA subscale = .77, TI subscale = .88. Validity NR.

Measurement Biases
Were the evaluators blind to treatment status? Circle yes or no, and if no, explain.

YES/NO All students received treatment, and all occupational therapists and teachers were aware of treatment status. Furthermore, the COPM is a subjective measure filled out by the same teachers who carried out interventions.

Recall or memory bias. Circle yes or no, and if yes, explain.

YES/NO

Others (list and explain):

RESULTS
List results of outcomes relevant to answering the focused question
Include statistical significance where appropriate ($p < 0.05$).
Include effect size if reported.

The COPM performance mean score at baseline was 3.80 ($SD = 1.27$), and at reassessment was 5.30 ($SD = 1.72$). The mean change was 1.50 ($SD = 1.63$), which is a statistically significant difference (t-test: $p < .001$). The COPM satisfaction mean score at baseline was 3.79 ($SD = 1.66$), and at reassessment was 5.71 ($SD = 2.19$). The mean
change was 1.92 (SD = 2.38). Changes on both the performance and satisfaction scales was statistically significant (t test: \( p < .001 \) for each). However, the COPM authors cite 2 points as the minimum clinically significant difference for adults.

The TI subscale rating showed that 80% of teachers implemented or transferred knowledge acquired from the occupational therapist to other students in their class with similar issues or shared this knowledge with other teachers with moderate to complete success. The TA subscale showed that teachers’ awareness of the students’ special needs changed in a positive direction; however, the change was not statistically significant.

A greater change in the COPM performance score was associated with a lower initial COPM performance score (\( p = .001 \)), a greater change in teacher awareness (\( p < .05 \)), a greater degree of teacher implementation of occupational therapy strategies (\( p < .05 \)), and students’ attending public school rather than a separate school (\( p < .05 \)).

A greater change in the COPM satisfaction score was associated with a lower initial COPM satisfaction score (\( p < .001 \)) and a greater degree of teacher implementation of OT strategies (\( p < .001 \)).

Was this study adequately powered (large enough to show a difference)? *Circle yes or no, and if no, explain.*

**YES/NO**

Were appropriate analytic methods used? *Circle yes or no, and if no, explain.*

**YES/NO**

Were statistics appropriately reported (in written or table format)? *Circle yes or no, and if no, explain.*

**YES/NO**

**CONCLUSIONS**

State the authors’ conclusions that are applicable to answering the evidence-based question.

This paper provides some evidence of the benefits of OTSBC service. The results contribute to understanding the importance of teachers’ awareness of the occupational performance of students with fine motor problems on the resolution of occupational performance issues.

Another interesting finding in the regression analysis was that the students in the public school board (74% of the sample) showed a greater change in the teacher’s perception of performance
on the COPM than those in the separate school board (26% of the sample). This study is limited by its lack of a control group and several measurement biases relating to teachers’ subjectivity, as well as limited psychometric testing on one of the outcome measures (the TAS).

This work is based on the evidence-based literature review completed by Molly Storer, OTS, and Margaret Morris, OTD, OTR/L, Faculty Advisor, Tufts University.

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