Comparison of Two Service Delivery Models: In-Class and Out-of-Class Therapy Approaches

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To examine the relative effectiveness of in-class versus out-of-class PT/OT preschool service delivery models, the investigators randomly assigned 61 preschool children (28 with motor delays and 33 without motor delays) to the two conditions. The *Battelle Developmental Scales* and the *McCarthy Scales of Children's Abilities* were administered pre- and post-test. Classroom staff were also administered a questionnaire to evaluate their perceptions of the relative effectiveness of two models. No significant differences were found between groups for students with motor delays, although a trend favoring the in-class condition was noted. One significant difference favoring the out-of-class condition was found for children without motor delays on the gross motor subtest of the Battelle. The questionnaire results overall, however, indicated a preference for the in-class service model. A rationale for the trends is discussed, as well as future research needs.

In 1977, Sternat and colleagues described two different service delivery models for provision of public school therapy to children with severe disabilities.[1] The more traditional or "isolated" therapy model involved removing the child from the classroom and carrying out the therapy in a specially equipped therapy room. Advantages of this model included the availability of specialized therapy equipment and the reduction of potential outside distractions. Disadvantages included loss of class contact time, interruption of classroom scheduling, and the possible stigmatization of removing the child from the classroom.

The second model, an "integrated" approach, required that assessment and treatment take place *within* the classroom with specialized therapy equipment brought into the room as needed. The child's therapy needs would be evaluated in conjuction with other school staff and parents. Advantages of this model included closer interaction with teaching staff and parents to determine how therapy could be incorporated into activities of daily living, and opportunities for the therapist to continually model appropriate handling and positioning activities within the classroom. Harris and Tada espoused this latter approach for working with disabled infants because of its ease in facilitating carry-over in handling and positioning by teachers and parents.[2] More recently, Tada and Harris have suggested that the integrated model "seems especially appropriate for the child with multiple handicaps who may require the services of a number of different support service personnel."[3]

Giangreco defined the integrated approach as "the incorporation of educational and therapeutic techniques employed cooperatively to assess, plan, implement, evaluate, and report progress on common goals and needs."[4] Such integration is one aspect of the transdisciplinary team approach described by Hutchinson which also includes the provision of therapy services which are indirect and decentralized.[4,5] In a single-subject study (A-B-A-B), Giangreco compared the effectiveness of a direct/isolated therapy approach to an indirect/integrated approach for a 13-year-old student with multiple and profound disabilities. Significantly improved performance was demonstrated in this student's ability to activate an adapted microswitch for accessing preferred music during the phases in which therapy was delivered in an indirect/integrated fashion.[6]

Although the integrated therapy model appears to be gaining increased acceptance in a variety of public school and early childhood special education settings, no group studies have been conducted to compare its efficacy with that of the more traditional isolated or "pull-out" model. The purpose of this study was to examine the relative effectiveness of the two

0898-5669/89/0102-0049$2.00/0
PEDIATRIC PHYSICAL THERAPY

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Table 1

Pretest Subject Description for Students Identified as Requiring Motor Development Services for In-Class Service Delivery and Out-of-Class Service Delivery

	In-Class ($N = 13$)		Out-of-Class ($N = 15$)		
	Mean	S.D.	Mean	S.D.	Significance
Age (months)	58.7	8.2	52.2	9.2	N.S.
McCarthy General Cognitive Index	70.7	13.1	72.5	21.7	N.S.
McCarthy Motor Scaled Score	32.5	5.8	30.9	8.2	N.S.
Battelle Gross Motor Scaled Score	84.5	19.3	84.9	15.7	N.S.
Battelle Fine Motor Scaled Score	78	8.7	78.8	11.6	N.S.

Table 2

Pretest Subject Description for Students Not Requiring Motor Development Services for In-Class Service Delivery and Out-of-Class Service Delivery

	In-Class ($N = 14$)		Out-of-Class ($N = 19$)		
	Mean	S.D.	Mean	S.D.	Significance
Age (months)	58.1	6.5	54.5	7.2	N.S.
McCarthy General Cognitive Index	79.1	15.5	87.2	10.6	N.S.
McCarthy Motor Scaled Score	33	8.4	39.4	7.2	$p < 0.05$
Battelle Gross Motor Scaled Score	104.9	17	106.3	13.7	N.S.
Battelle Fine Motor Scaled Score	98.1	15.4	99.4	14.1	N.S.

models for delivering physical (PT) and occupational therapy (OT) services. Two research questions were addressed: (1) Would either model provide greater gains in fine and gross motor skills for preschool children in a special education setting? and (2) Would either model be viewed by classroom teachers as more effective or more efficient in meeting the therapy needs of the children in their classrooms?

METHODOLOGY

Subjects

Subjects for this study were 61 children enrolled in the special education preschool at a Pacific Northwest university laboratory school. Included were 42 boys and 19 girls ranging in age from 40 to 69 months (mean age = 55.6 months). Of these students, 28 had been identified as needing PT/OT services based on performance at 1.5 standard deviations below the mean on a standardized motor test[7] and subjective evaluation of quality of movement by members of the PT/OT staff. Of these 28 subjects, 23 had a diagnosis of general developmental delay. The remaining students had diagnoses that included orthopedically impaired, Down syndrome, Sturge Weber, or William syndrome. An additional group of 25 students was qualified as eligible to receive early childhood special education services based on state guidelines, but did not qualify for PT/OT services. The remaining 8 students in the sample were normally-developing peer models. Descriptive information for the children needing PT/OT services appears in Table 1. Descriptive information for the children not eligible for therapy services (including peer models) appears in Table 2.

Subjects were randomly assigned to six preschool classrooms. The six classrooms were then randomly assigned to either an in-class (integrated) or an out-of-class (isolated) service delivery model. The children were in school for a half-day (2 hour) program. Two classroom teachers had one half-day program using an in-class model and one half-day program using an out-of-classroom model. Two additional teachers had only one class, with either an in-class model or an out-of-class model. At the beginning of the school year, 68 children were enrolled in the study. Parents of two children in the in-class model requested that their children continue to be served on an individual basis using the isolated or "pull-out" model; these student's scores were not included in the data analysis. Five students moved during the school year and were not included in the research. The final number of subjects was 61, including 28 subjects with motor delays and 33 without motor delays.

Service-Delivery Models

The OT/PT service delivery to students consisted primarily of functional intervention directed toward promoting motor skills necessary for school success, as well as general motor performance. All intervention was designed to facilitate motor skills directly, in contrast to intervention designed primarily to facilitate

language, reading, or other skills indirectly through the motor activities. An average of 45 minutes of therapy per week was provided to students. Service providers were registered therapists with at least 1 year of experience serving pediatric populations. The focus of intervention was on measurable motor performance. This included goals in the area of quality of movement as well as more objectively measured goals of quantity of motor performance.

In-class service delivery was defined as provision of therapy services by the PT/OT staff within the same room occupied by the teaching staff and other students. Out-of-class services were defined as those occurring in isolation from the classroom staff and the majority of students in the class. These were typically held in a separate therapy room, or in a section of the gym isolated from other activities, and separated by a curtain. In both the in-class and out-of-class models, small group and individual therapy was conducted. The amount of small group versus individual therapy was balanced across the in-class and out-of-class models to avoid a confound between the variables of place of therapy and size of therapy groups.

Assessment Procedures

To evaluate the efficacy of the two service delivery models on gross and fine motor skills, all children were pretested and post-tested using the gross and fine motor subtests of the Battelle Developmental Scales[7] and the motor scale of the McCarthy Scales of Children's Abilities.[8] These instruments were selected because they are normed in the preschool age range (2 years to 8 years for the McCarthy, and birth to 8 years for the Battelle), and are widely used as diagnostic instruments for documenting eligibility for preschool special education services. The Battelle reports test-retest reliability (in the age range of the study sample) from 0.95 to 0.98. This was established with a norming group of 300 children. The McCarthy reports test-retest reliability ranging from 0.75 to 0.78 in the age range of the study sample. The norming group included 80 students.

Pretesting occurred during the fall of 1986 and post-testing during the summer of 1987. A minimum of 8 months passed between pretesting and post-testing. The testers, who included occupational therapists and graduate students in special education and psychology, were blind to the subjects' group assignment.

In addition to assessing child change measures on gross and fine motor skills, questionnaires were administered to classroom staff to examine their perceptions about incidental learning of motor skills by the classroom staff, overall convenience of each of the models, and understanding of the roles of PT/OT staff. Five classroom staff members completed the questionnaires: two head teachers, two assistant teachers, and one speech-language pathologist. A Likert scale was used for each of the 13 questions: 1 = strongly disagree; 2 = disagree; 3 = undecided or neutral; 4 = agree; 5 = strongly agree. Since each staff member had worked in settings with both types of service delivery models (in-class and out-of-class), each completed two identical questionnaires comparing the two models.

The questionnaire was developed by the authors for the purpose of evaluating perceived advantages and disadvantages of the two service models by classroom staff. Specific questions were generated in part by issues identified in the literature, such as possible distractions of in-class service, or stigmatization of

Table 3

Post-test Performance of Students Requiring Motor Development Services in In-Class and Out-of-Class Service Delivery Models

	In-Class ($N = 13$)		Out-of-Class ($N = 15$)		
	Mean	S.D.	Mean	S.D.	Significance
McCarthy Motor Scaled Score Post-test	35.4	12.5	30.3	8.6	N.S.
Battelle Gross Motor Scaled Score Post-test	90.3	18.7	84.1	16.1	N.S.
Battelle Fine Motor Scaled Score Post-test	82.2	13.2	80.7	13.9	N.S.

Table 4

Post-test Performance of Students Not Requiring Motor Development Services in In-Class and Out-of-Class Service Delivery Models

	In-Class ($N = 14$)		Out-of-Class ($N = 19$)		
	Mean	S.D.	Mean	S.D.	Significance
McCarthy Motor Scaled Score Post-test	39.6	12	45	8	N.S.
Battelle Gross Motor Scaled Score Post-test	98.9	14.9	110.4	14.3	$p < 0.05$
Battelle Fine Motor Scaled Score Post-test	97.9	22.1	97.6	14.9	N.S.

removing the child from the classroom in the out-of-class model.[1] Because the reliability and validity of the questionnaire have not been established, the results must be interpreted cautiously. The face validity of the items, however, appears to be strong enough to allow examination of the results for general trends.

RESULTS

Gross and Fine Motor Skills

One-way analysis of variance was used to compare post-test scores between the in-class model and the out-of-class model for students identified as in need of therapy services (N = 28). No significant between-group differences or interactions were noted (see Table 3). A similar analysis was conducted for the students who were not in need of specific therapy (N = 33). A significant difference was found on the gross motor subtest of the Battelle in favor of the out-of-class model ($p < 0.05$). No significant differences were found for the Battelle fine motor subtest or for the McCarthy motor scale.

Although no statistically significant differences between in-class and out-of-class service delivery models for post-test motor performance for the students identified as needing PT/OT services was demonstrated, very slight trends favoring the in-class group were noted on all three motor measures. The in-class group achieved scale scores on the two motor tests from 2.5 to 6.2 points higher than the out-of-class group. The relatively small N for the students in need of motor services (13 in-class, 15 out-of-class) reduces the chances of achieving statistical significance; however, the trend across the McCarthy Motor, Battelle Gross Motor, and Battelle Fine Motor scales favoring the in-class subjects certainly encourages further examination. Surprisingly, the opposite trend was observed for the students without motor development needs with the out-of-class model resulting in higher post-test scores on two of the three measures.

Questionnaire

Five classroom staff members who were assigned to both in-class and out-of-class service models completed two identical questionnaires—one for their experiences with the half-day in-class model and one for their experiences with the half-day out-of-class model. Descriptive statistics for the questionnaire results are presented in Table 5.

Several interesting trends were noted from the staff questionnaires. When questioned about the in-class model, staff reported more use of PT/OT services to facilitate academics and other instruction (question 7) and noted that students without specific PT/OT objectives also benefited from classroom involvement by the therapists (question 9). While answers to both of these questions support the use of the in-class model, it should be noted that classroom staff found

Table 5

Staff Responses to Questionnaires for Both the In-Class and Out-of-Class Service Delivery Models

	In-Class Questionnaire		Out-of-Class Questionnaire	
	Mean	S.D.	Mean	S.D.
1. I prefer that OT/PT services consist mainly of small group therapy.	4.6	0.89	3.6	1.34
2. I prefer OT/PT services to consist mainly of individual service delivery.	2.6	0.89	2.8	0.84
3. When the OT/PT staff member is absent it presents a problem in the classroom.	3.6	1.52	2.4	1.14
4. Students receiving OT/PT services receive negative attention from other students because of it.	1	0	1.2	.45
5. PT/OT services are distracting to other students in class.	1.4	.55	1	0
6. Therapy equipment in the classroom is a problem.	1.6	.89	1.4	.89
7. I use PT/OT services to facilitate academics and other instruction.	3.8	1.10	2	1.22
8. I am familiar with children's IEP objectives for PT/OT.	3.4	0.89	2.8	1.30
9. Students who do not have specific IEP therapy objectives also benefit from OT/PT staff.	4.8	0.45	3	1.87
10. Students with OT/PT IEP objectives benefit greatly from OT/PT services.	4.8	0.45	4.2	0.84
11. The PT/OT service delivery model was equally beneficial for all students needing PT/OT services.	3.8	1.3	2.4	1.14
12. I have learned new ideas and information from working with the OT/PT staff.	4.0	0.55	3.8	0.84
13. I understand the role of the OT/PT staff better now than at the beginning of the year.	4.4	0.55	3.4	0.89

N = 5.

Note: Likert Scale rating 5 = strongly agree, 1 = strongly disagree

it to be more problematic when PT/OT staff were absent when the in-class model was being used (question 3).

While we had anticipated that the in-class model might reduce the individual time provided to students with specific individualized education program (IEP) therapy objectives, the responses to question 10 suggested that the instructional staff actually favored the in-class model for providing greater benefit to students identified as in need of therapy. We had also expected that the in-class model might be considered less useful for some types of students such as distractible children or students with specialized equipment needs. Responses to question 11, however, which addressed these possible concerns, indicated that instructional staff favored the in-class model for providing equality of services to students in need of PT/OT.

In examining responses to questions 1 and 2, it is interesting to note that regardless of the service delivery model used (in-class or out-of-class), the classroom staff clearly preferred that PT/OT be delivered in small groups rather than on an individual basis. Neither model appeared to result in embarrassment or negative attention to students receiving service (question 4), nor did either model appear to result in distractions to other students in the class (question 5). Also, use of therapy equipment in the classroom, as sometimes required by the in-class model, did not seem to present problems for classroom staff (question 6). The responses to question 12 indicated that both models facilitated the transfer of new ideas and information from PT/OT staff to classroom instructional staff. It should be noted that weekly staffings were conducted in both the in-class and out-of-class models. This provided opportunities for communication between the PT/OT staff and other staff within the out-of-class model, although it was less frequent than staff contact within the in-class model.

DISCUSSION

While classroom staff viewed the in-class model as being more beneficial to students *without* specific therapy needs, the post-test scores on the gross motor subtest of the Battelle contradict this belief. It is possible that teachers who conduct gross motor activities without the assistance of PT/OT staff may gear their activities toward the higher-functioning students while teachers who have assistance from therapy staff focus gross motor activities toward the students with motor difficulties. The trend for students with identified therapy needs to perform better in the in-class model supports this interpretation.

Because of the small number of responses for the staff questionnaire, these results must be viewed with caution. A number of trends, however, support previous assumptions about the potential of an in-class, integrated model. It appears that the in-class model is *not* particularly distracting for teachers or students in the classroom and that teachers use the therapy time to facilitate other instruction. It is also promising that instructional staff feel that PT/OT services are useful to other students in the classroom in addition to the students with identified therapy needs (those with specific IEP therapy objectives). Other advantages of the in-class model included use of the PT/OT services to facilitate academics and other instruction as well as a greater understanding of PT/OT objectives and the roles of PT/OT staff.

For the 28 students with identified needs for therapy, no significant differences were noted on any of the post-test motor measures between those receiving in-class services versus those receiving out-of-class services. These results alone would suggest that either model would be equally beneficial for providing therapy services for preschool children with motor handicaps. The responses to the questionnaires by the classroom staff, albeit limited in number, suggest that the in-class model is preferred.

Public Law 94-142, the Education for All Handicapped Children Act, includes physical and occupational therapy under "related services" which are "required to assist a handicapped child to benefit from special education."[9] By mandating that school-based PT/OT services must be educationally relevant, this federal law suggests that therapy goals should be integrated within the child's overall education program. The in-class or integrated therapy model appears to be more consistent with the overall objectives of Public Law 94-142 than does the more traditional "pull-out" or out-of-class model which typifies the original, medically based orientation of physical and occupational therapy.

Results from this study can be applied to the field in several ways. It appears that use of an in-class model for at least a portion of a therapist's caseload may increase teacher knowledge of motor services, and facilitate communication between OT/PT staff and other school staff.

Monitoring of the general classroom motor activities by OT/PT staff may be necessary to ensure that students without motor needs are not being excluded from appropriate motor activities due to the classroom teacher's increased awareness and knowledge regarding service delivery to students with motor needs. Teachers may benefit from consulting regarding the differential needs of the students, and how to plan classroom activities to meet the needs of both groups.

CONCLUSION

In summary, the in-class or integrated service delivery model is preferred by teaching staff and presents little difficulty in accommodating most students with mild developmental delays. For preschool students with identified motor deficits, no difference was noted in motor gains when using an in-class versus out-of-class model. A difference however, in favor of the out-of-class model was shown on one of the three motor measures for students without identified PT/OT needs.

Additional research is needed that would incorporate larger classroom staff groups to further justify the use of an in-class therapy model. Perceived benefits and preferences of the physical and occupational therapists who are delivering these two types of services should be evaluated. A cost/benefit analysis of the two service delivery models would also be of

interest, as would an examination of the effects of the two service models on more specific, homogeneous groups of students with motor needs. The present study is limited by a relatively small *N*, and by inclusion of a typical, but rather heterogeneous, group of preschool students with motor needs. Research conducted with a larger *N* would be useful in determining whether the nonsignificant trends toward greater motor gains in the in-class model can be substantiated.

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