Team Approaches to Treating Children With Disabilities: A Comparison

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Objective: To investigate differences in team functioning between the multidisciplinary and transdisciplinary models when treating children with disabilities.

Design: A crossover trial.

Setting: An outpatient educational and rehabilitation program in a rehabilitation institute based at a university medical center.

Participants: A population-based sample of 19 rehabilitation specialists and educators.

Intervention: Participants attended four team meetings using the multidisciplinary approach and then attended four team meetings using the transdisciplinary approach.

Outcome Measures: Behavioral ratings of team participation (Transdisciplinary Team Rating Scale) and self-report instruments of team development (Team Assessment Questionnaire) and treatment planning and goal development (Staff Perception Questionnaire).

Results: Results of $t$ tests confirmed the hypothesis that there was more team member participation during transdisciplinary meetings than during multidisciplinary meetings ($p = .027$). There were no differences in levels of team development ($p = .329$); however, staff members favored the transdisciplinary model for treatment planning and goal development ($p < .001$).

Conclusion: This study provides evidence of the effectiveness of the transdisciplinary model. Further research is now needed to investigate outcome variables such as rate of success in attaining treatment goals when using this model.

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Most educational programs for students with disabilities use some form of the multidisciplinary or transdisciplinary team model. The essential differences between the models are the amount and type of communication among team professionals. 1 Despite numerous theoretical articles describing team models and their widespread use in educational and hospital settings, empirical evaluations of team models are sparse. 2 With increasing emphasis on managed care and cost effectiveness, investigations of current team models of service delivery are necessary. 3 The few existing investigations indicate that cohesive team functioning is positively correlated with patient care and treatment planning. 4, 5 Wagner 6 suggested that patient outcome was highly related to team collaboration. Further research on team functioning has been limited by several factors, including narrow understandings of team functioning, extensive periods of time necessary to observe team functioning, and resistance from team professionals to studies of their behavior.

The multidisciplinary approach is the original prototype for team function in rehabilitation medicine settings. 7 In the multidisciplinary model, the roles of each team member are clearly defined and communication is relatively limited. Professionals from different disciplines work with the same children; however, they function quite independently. 8 Each professional conducts his or her own discipline-specific assessment of the child and formulates discipline-specific goals. The results are then shared during team meetings. 9 Team meetings, for the purposes of coordinating care, are often perceived as optional.

The transdisciplinary approach was introduced in the United States in the 1970s as a team model for educating children with cerebral palsy. The approach has since been adopted in some rehabilitation settings. 3 The ultimate goals of the transdisciplinary approach are to promote integrated assessment and to develop a unified treatment plan that is jointly carried out by all team members. Three primary features differentiate the transdisciplinary model from other team models. First, the transdisciplinary model underscores team communication and coordination of care. Team meetings are required, particularly to promote staff communication. Team meetings are coordinated by a facilitator who fosters development of a holistic treatment plan based on the child's needs. Second, in transdisciplinary teamwork, there is a high degree of collaboration among team members in conducting assessments. 9 Team members collectively plan and implement the assessment. Results are then discussed and integrated treatment goals are developed during the team meetings. Third, in the transdisciplinary approach, discipline-specific assessments are supplemented by a global, environment-referenced measure. This assessment specifically measures the child's adaptation to environmental demands in daily activities. 9

The current investigation was part of a larger study examining the assessment process for students with multiple disabilities. The purpose of this study was to investigate the differences between the multidisciplinary and transdisciplinary team models. This study was an initial attempt to investigate aspects of team functioning at both the individual team member level and the group level. It was hypothesized that (1) there is more team
member participation during the transdisciplinary meetings than during multidisciplinary meetings, (2) there is a higher level of team development during transdisciplinary meetings than during multidisciplinary meetings, and (3) team members will perceive the transdisciplinary model to be more effective than the multidisciplinary model in team treatment planning and goal development.

METHODS

Procedures and Subjects

Nineteen professionals who provide services in a hospital-based preschool and infant developmental program served as participants. The children enrolled in the outpatient educational and rehabilitation program have physical and developmental disabilities. The type of discipline and number of team members represented include physical therapy (3), occupational therapy (2), speech/language pathology (2), social work (1), psychology (1), and special education (10). Some professionals served on more than one team.

Weekly team meetings are held to review a child’s progress in school and in treatment, as well as to develop goals for future interventions. Since the multidisciplinary team approach was the model used in this setting, four multidisciplinary meetings were randomly chosen from the first semester (mean length, 28.9 min; SD, 5.14). These meetings were videotaped for inclusion in this study. Eight professionals attended the first multidisciplinary team meeting; 9 attended the second; 10 attended the third; and 9 attended the fourth. Of course, some team members attended more than one meeting. Thus, not all 36 observations were independent. In these cases, the individual’s observations were averaged to create one score per person.

Four transdisciplinary meetings were held during the second semester of the academic year, ie, 3 to 6 months after the multidisciplinary meetings. Staff members received no special training in the transdisciplinary approach. Instead, the style and the format used by the facilitator during the meetings were different. The explanation given to the team members regarding the change in approach was neutral, ie, different approaches to child assessment and team meetings were being investigated.

These meetings were videotaped for inclusion (mean length, 49.5 min; SD, 4.19). The children to be reviewed at each transdisciplinary meeting were matched for age and functional level to those reviewed in the multidisciplinary meetings. Those professionals attending the first transdisciplinary meeting were the same staff members who attended the first multidisciplinary meeting and so on for each of the four transdisciplinary meetings. As before, when a staff member attended more than one meeting, his or her scores were averaged. Thus, a total of 8 team meetings (4 multidisciplinary and 4 transdisciplinary meetings) were conducted.

During each team meeting, participants were told that the meeting was being videotaped as part of a larger study on child assessment and team functioning and that all data would be confidential. The assessment results and treatment plans for one child were then discussed.

All children who attend the preschool program have been classified as having one of the following: developmental disabilities, orthopedic impairments, or other health impairments. The children’s diagnoses include spina bifida, cerebral palsy, hypotonia, and spinal muscular atrophy. The mean age of the eight children was 3.9yrs (SD, 36). Three children are Caucasian, two are African-American, two are Hispanic, and one is Asian.

During multidisciplinary team meetings there was no designated leader. However, usually the classroom teacher or the therapist with the most experience acted as the leader. Although there was no formal protocol followed in the team meetings, certain phases typical to multidisciplinary team functioning did emerge. First, the teacher “team leader” usually reviewed the child’s history, progress, and strengths or weaknesses. Second, each professional shared treatment progress with the team. Third, each professional presented treatment goals that had been developed before the team meeting.

The following are brief examples of treatment goals for children that were proposed during the multidisciplinary meetings. For one child diagnosed with spastic diplegic cerebral palsy, the physical therapist’s goals included more standing exercises to strengthen her trunk and legs, with an ultimate aim of improving her standing balance. For a second child diagnosed with developmental delays, the speech therapist’s goal was to enhance expressive language skills. For a third child diagnosed with a neurodegenerative disorder, the special education teacher’s goals included teaching colors and shapes. For a fourth child diagnosed with spina bifida, the occupational therapist’s goals included increasing upper body strength.

During transdisciplinary team meetings a clinical psychologist acted as a facilitator. The facilitator followed a standard protocol that included four components. First, the facilitator presented results of the child’s performance on the Southern California Ordinal Scale of Development (SCOSD), the environment-referenced measure used in the transdisciplinary approach for this study. The SCOSD assesses child development across six domains of functioning, ie, gross motor, fine motor, practical abilities, socio-affective, communication, and cognition. Second, the facilitator reviewed differences between multidisciplinary treatment goals and transdisciplinary treatment goals. Third, the facilitator asked the team to generate a list of areas of concern for the child, ie, to determine the child’s most pressing needs. Fourth, through group consensus, the team prioritized the areas of concern. The facilitator promoted team collaboration by encouraging the entire team to develop transdisciplinary goals for the child that addressed the areas of concern. To control for the impact of her mere presence in the group, the facilitator attended the multidisciplinary meetings but did not assume a facilitator role.

The following are some examples of goals devised for children during the transdisciplinary meetings. For one child diagnosed with spinal muscular atrophy, the team planned an agenda for a family meeting in order to help parents cope with the child’s sudden and irreversible physical deterioration. For a second child diagnosed with cerebral palsy, the team developed strategies to manage his aggressive behaviors in the classroom, clinic, and home. Scheduling a family meeting was also recommended so that the mother would reinforce team goals. For a third child diagnosed with spina bifida, the team devised appealing play activities with the goals of increasing his motivation to move his body and decreasing his passive behaviors with his classmates and at home. For a fourth child also diagnosed with spina bifida, the team formulated games that he could play with his classmates that required proper positioning of his hands and feet. There was also a discussion of methods that staff members and family members could employ to increase his low self-esteem, such as verbal prompts and encouragement.

A master’s level psychology assistant who was unfamiliar with the study was recruited to view the videotapes of the eight meetings. She was given information regarding the two models of team functioning, and was then asked to categorize each of the eight meetings as either transdisciplinary or multidisciplinary. She identified the eight meetings with 100% accuracy.
Measures

Three measures will be described below. The Transdisciplinary Team Participation Scale (TTPS) yields a team score for each behavior that is assessed. In contrast, the Team Assessment Questionnaire (TAQ) and the Staff Perception Questionnaire (SPQ) yield scores for each individual attending the meeting.

**TTPS.** The TTPS is an adaptation of the Rating of Individual Participation in Teams-Revised (RIPT-R).² The RIPT-R consists of 17 operationally defined behaviors indicative of participation in a team setting. The items are used to create five subscales: Preconference Preparation, Providing Information, Participating in the Group Process, Distractions, and Nonverbal Behavior. Scoring on these 17 items is completed by a trained rater and is based on direct observation of participation during team conferences. Each item is scored using a 5-point Likert scale.

The TTPS is comprised of 10 items from the RIPT-R. Four items assess the type of information provided by the staff member (ie, demographic, discipline-specific, responsive, and integrative data). Three items measure the manner in which the staff member disseminates information, (ie, reading from report verbatim, speaking impromptu with reference to report, or sharing information in a conversational manner). All of these items were based on items from the Providing Information subscale of the RIPT-R. The remaining three items were taken from the Participating in the Group Process subscale of the RIPT-R. They address the type of questions asked (ie, open-ended questions and closed-ended questions) and the number of transdisciplinary goals proposed. The Preconference Preparation items of the RIPT-R were not included because the activities measured by this subscale are not performed by professionals in this setting. The behaviors measured by the Distractions and Nonverbal subscale items of RIPT-R occurred with very low frequency in this population, and were therefore excluded from the TTPS.

Although the items of the TTPS were taken from the RIPT-R, the scoring for these items was revised. The Likert scale scoring of the RIPT-R calls for some degree of rater interpretation of behavior. However, the frequency count scoring adopted for the TTPS requires no interpretation by the rater. The trained coders simply record the occurrence of each behavior. Two master’s level professionals were trained in the scoring of this instrument. They rated the team meetings independently via videotape review. The reliability coefficient for the two TTPS raters was .97, demonstrating high interrater reliability.

Subscale scores are computed by totaling the occurrence ratings for each behavior. The behaviors are then weighted according to level of behavioral complexity (1 to 10) and totaled to create an overall participation score for the entire team. The weights assigned to the behaviors of the TTPS were generated using the same procedures described by the authors of other behavior rating scales such as the Observational Scale of Behavioral Distress.¹³ Five pediatric education and rehabilitation professionals familiar with both preschool services and the TTPS assigned intensity ratings to each behavior. The ratings differed by no more than 1.5 points. These five scores were averaged to yield the final intensity rating for each of the 10 behaviors (table 1). An alpha internal consistency of .80 was obtained for this sample.

**TAQ.** Based on Jewell and Reitz’s² theory of team development, the TAQ is a 43-item questionnaire designed to measure six aspects of team development: harmony, appreciation of diversity, trust, process, shared responsibility, and integration. A 7-point Likert scale is used for 33 of the items, while the remaining 10 items use a forced-choice response format. Participants completed the TAQ at the end of each team meeting. A Chronbach alpha reliability coefficient of .94 was obtained for the multidisciplinary meeting administrations of this instrument, and a reliability coefficient of .95 was found for the transdisciplinary meeting administrations.

**SPQ.** Wolery and Dyk¹² devised a 22-item questionnaire comparing staff members’ perceptions of interdisciplinary and transdisciplinary assessment models. The items measure staff development, knowledge of treatment model, child and parent assessment and training procedures, and team efficiency and effectiveness. While the TAQ was used as a process measure, the SPQ was used as an outcome measure of team functioning. Nine questions deal primarily with general issues comparing the two models. Twelve items are related to the appropriateness of each model for given types and ages of children. Twenty-one items are forced choice requiring that the participant endorse one of the two models. There is also one open-ended question regarding the two team models.

The adaptation of the SPQ used in this study is composed of 23 items. Twenty of these follow the same forced-choice format of the SPQ. Of these 20, 8 items are taken verbatim from the SPQ and another 3 entail only one-word additions to SPQ items. The remainder are new items that tap important dimen-

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<thead>
<tr>
<th>Table 1: Descriptive Statistics and t Values for TTPS</th>
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<tr>
<td><strong>Team Participation</strong></td>
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<tr>
<td>(Weight)</td>
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<tr>
<td>Providing information</td>
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<tr>
<td>Demographic</td>
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<td>Discipline-specific</td>
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<td>Responsive</td>
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<td>Integrative/ holistic</td>
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<td>Delivering information</td>
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<td>Verbatim (2)</td>
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<tr>
<td>Reference report (5)</td>
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<tr>
<td>Conversational (8)</td>
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<tr>
<td>Participating in group process</td>
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<tr>
<td>Yes/no questions (4)</td>
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<tr>
<td>Open-ended questions (8)</td>
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<tr>
<td>Transdisciplinary goals (10)</td>
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<tr>
<td>Total</td>
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The revised TTPS scores are presented—ie, weighted raw scores are divided by length of meeting (measured in minutes). To compute the frequency of behaviors per minute, divide the revised TTPS score by the weight. For example, by dividing the staff’s revised integrative data score (1.9) by the weight for that behavior (10), we find that the staff asked open-ended questions an average of .19 times per minute during the multidisciplinary meetings. Thus, on average, an integrative statement was made approximately every 5 minutes during the multidisciplinary meetings and every 3 minutes during the transdisciplinary meetings.

* df = 8 |

There was no variance in the transdisciplinary condition; therefore, no t test was conducted.
sions of the preschool experience that are not addressed in the SPQ. The open-ended question is taken from the SPQ; however, two final questions were added that address satisfaction ratings of the two models. Respondents used a 7-point Likert scale for these two questions.

The scoring of the adapted instrument follows the same procedure recommended by Wolery and Dyk: frequency counts of multidisciplinary model endorsements and frequency counts of transdisciplinary model endorsements are computed. These scores are based on responses to the forced-choice items. In addition to these scores, the two satisfaction ratings were used for data analysis. The SPQ was given to team members 4 weeks after the final team assessment meeting. An alpha internal consistency of .92 was obtained for the SPQ in this sample.

RESULTS

The length of the team meetings was not held constant; therefore, its relationship to team participation and staff perceptions was investigated. A significant correlation was found between staff participation and length of the meeting (r = .80, p < .01). It is assumed that participation is distributed relatively equally across the duration of the meeting. To control for the impact of meeting time on participation, the staff participation scores were divided by the length of the meeting. The revised participation scores were no longer correlated with the length of the meeting; thus, they were used in further analyses. It was not necessary to compute revised scores for the TAQ or the SPQ, since neither of these outcome variables was correlated with length of meeting.

The first hypothesis stated that there is more team member participation during transdisciplinary meetings than during multidisciplinary meetings. T tests using the revised behavioral observations of participation scores (TTPS) were used to test this hypothesis. The group participation scores from the four multidisciplinary meetings were compared to those of the four transdisciplinary meetings. Results confirmed that staff members evidenced greater participation in the transdisciplinary meetings (mean = 21.6, SD = 4.76) than in the multidisciplinary meetings (mean = 13.8, SD = 4.47), even after having controlled for the length of the meeting (t[6] = -2.39, p = .027) (table 1). Specifically, more holistic statements were made about the child in the transdisciplinary meetings. Information was also presented in a conversational manner during transdisciplinary meetings rather than referencing reports or reading notes verbatim. Further, significantly more transdisciplinary goals were proposed during transdisciplinary meetings than during multidisciplinary meetings.

The second hypothesis stated that there is a higher level of team development during transdisciplinary meetings than during multidisciplinary meetings. This hypothesis was not supported. Paired sample t tests did not detect differences between team development scores in the multidisciplinary meetings (mean = 226.5, SD = 34.65) and in the transdisciplinary meetings (mean = 222.9; SD = 26.59) (t[18] = 45, p = .329).

The third hypothesis stated that team members will perceive the transdisciplinary model to be more effective than the multidisciplinary model in treatment planning and goal development. Paired sample t tests were used to test this hypothesis. Data from the SPQ that was administered at the end of the academic year revealed a strong preference for the transdisciplinary model. Team members endorsed the multidisciplinary model an average of 13.4 times (SD = 6.24) (t[11] = -6.39, p < .001). For example, participants reported that the transdisciplinary approach provided more integrative/holistic information about the child. Participants also stated that there were fewer miscommunications between team members in the transdisciplinary approach. Further, participants reported that there was more team agreement on specific issues in the transdisciplinary model. When asked to rate their level of satisfaction with each approach (using a 7-point Likert scale), again the transdisciplinary model (mean = 5.5, SD = .80) was rated higher than the multidisciplinary model (mean = 3.4, SD = .67) (t[11] = 5.82, p < .001).

DISCUSSION

The present investigation was designed to compare the multidisciplinary and transdisciplinary models in an educational setting for children with disabilities. Team members’ participation, team development, and efficacy of treatment planning and goal development were measured in each condition. Results confirmed the first hypothesis that there is more team member participation when using the transdisciplinary model than when using the multidisciplinary model. Moreover, significantly more integrative/holistic statements were made about the child and more transdisciplinary goals were proposed during the former. These findings confirm the theoretical literature regarding team models.14,35

The second hypothesis stating that levels of team development are higher during the transdisciplinary meetings than during the multidisciplinary meetings was not confirmed. Team members in this study did not perceive that the transdisciplinary model promoted a higher level of team development (eg, team harmony, team trust, etc). In the transdisciplinary approach team members must collaborate, negotiate responsibilities, and allocate human resources in an integrated fashion. Clinical experience suggests that efforts to increase team communication and to coordinate care (as in the transdisciplinary approach) also result in increased opportunity for team member disagreement, role conflict, and struggles for power. Moreover, conflicts may arise over how to collaborate, how to share responsibilities, and whose human resources will be most valued.2 Strasser and associates6 found that approximately half of their sample perceived that team members sometimes encroach on professional territory and that their own capacities are not fully used by other team members. The introduction of the transdisciplinary approach may have brought these types of challenges to the staff meetings. It would be helpful to reexamine the staff members 1 year later, to look for successful and/or unsuccessful resolutions to these team development challenges.

Team members did perceive the transdisciplinary model to be more effective in terms of team treatment planning and goal development. They believed that the transdisciplinary model was more effective in providing an integrative, holistic view of the child. This result supports the theoretical literature regarding team models. Participants in this study provide services to children in a center-based program and team emphasis has historically been driven by outcome, not process. Given that treatment outcome is a high priority for service providers in the current health care climate, it is not surprising that these results would mirror the trends in health care.

The results of this study provide empirical support for two of the three hypotheses. Anecdotal reports from participants also support this approach and help to elucidate some limitations of the multidisciplinary approach. These limitations have also been noted by others. For example, when team members function independently, fragmented care can result because of divergent treatment plans, goals, and expectations.3 In contrast, the
transdisciplinary model is more child focused. Staff members are responsible for integrating their interventions, rather than requiring the child to incorporate the multiple interventions by himself or herself.

One limitation of this study was the lack of parental involvement. Although there is no universal definition of the transdisciplinary model, some authors suggest that the parents are essential members of the transdisciplinary team.1,9 Future research should investigate the impact of parent involvement on team functioning. The heterogeneity of the children's diagnoses did not allow for the examination of differential effectiveness by diagnosis. Replication of this study in other settings would enable further exploration of this issue and would increase the generalizability of these findings.

This study was an initial attempt to measure team functioning from both the individual team member level and the group level in an early childhood educational program for students with disabilities. The impact of team functioning on the children was not explored. Therefore, future research can investigate the team’s ability to implement and achieve transdisciplinary goals. Specifically, research examining multidisciplinary versus transdisciplinary treatment goal attainment and child outcome is necessary. Further investigation may lead to the implementation of increasingly effective team assessments and interventions. Finally, one facilitator, a psychologist, was used in the study. Future studies can compare team meetings with and without a team facilitator. Training team members to act as facilitators may be a more cost-effective method for treating children with disabilities.

References