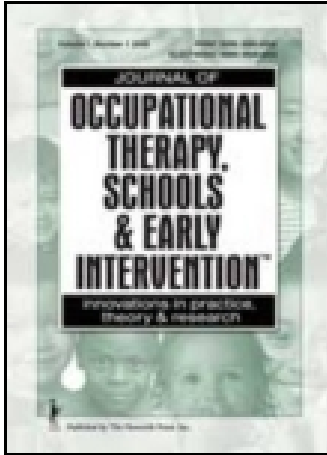


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NICU Primer for Occupational Therapists: Therapeutic Staffing Trends in Northwest Neonatal Intensive Care Units—Part II of II

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Edited by Kari J. Tanta

NICU Primer for Occupational Therapists: Therapeutic Staffing Trends in Northwest Neonatal Intensive Care Units—Part II of II

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The purpose of this article (Part II of a two-part series) is to highlight a study of therapeutic staffing and occupational therapy (OT) in neonatal intensive care units (NICUs). Twenty-seven surveys were mailed to speech language pathologists, physical therapists, and occupational therapists working in Northwest NICUs. Twelve surveys (44%) were returned, with eight completed and eligible for analysis (35%). Data were analyzed quantitatively and qualitatively. Descriptions of evaluation and treatment, transdisciplinary service delivery, and relationships with medical staff were discussed as were factors influencing current staffing patterns. Implications for practice and directions for the future are presented.

Keywords Occupational therapy, neonatal intensive care unit, infants, pediatric, administration

Introduction

In Part I of our two-part series on neonatal intensive care (NICU) practice (Tanta & Langton, 2010), we presented information regarding an overlapping and interdisciplinary

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nature-to-service provision in the NICU while focusing on the role of the occupational therapist (OT). Information from texts and common belief suggest that OT, physical therapy (PT), and speech language pathology (SLP) departments all contribute staff to NICU teams (Hunter, 2005). However, there is limited information in the literature regarding current NICU staffing trends. At a time when health care costs are rising and medical technologies are advancing to the point that increasingly fragile infants are being cared for in NICUs, it is valuable to have current information about existing models of care. Such information is beneficial for informing practice and for helping to establish or modify industry guidelines for work in this specialty practice area. It is with the aim of informing current practice that Part II of this series—"Therapeutic Staffing Trends in Pacific Northwest (PNW) NICUs"—is presented.

Current Staffing Trends

Despite a generalized lack of current information on NICU staffing, there are two studies that begin to shed light on this issue. First, Limperopoulos and Majnemer (2002) studied 38 Canadian NICUs. They reported that therapeutic staffing ranged from having no coverage at all (16%) to having coverage less than one time a month (11%) to having weekly coverage by an OT (55%), a physical therapist (PT; 58%), and/or an SLP (13%). In this study, 29% of departments using OTs (6 of 21) had occupational therapy as the only therapeutic provider. In the same study, PTs were found to be the sole provider in 18% (4 of 22) of the units that utilized the physical therapy staff. There were no departments that utilized SLPs only.

Second, in 1992, Rapport (1992) conducted a national survey of NICUs in the United States to determine, in part, what the role of PTs and OTs was. Respondents included directors, registered nurses, PTs, OTs, and others. Interestingly, 43% of respondents ($n = 90$) said that OTs and PTs provide the same services in the NICU, whereas the remainder answered that each discipline provided different services. Forty-five percent ($n = 94$) felt that either OT or PT was sufficient in the NICU, whereas the remaining participants reported that service from both disciplines was necessary. This study showed evidence of the variability in service provision and staffing patterns possible in neonatal care units. "The nature of the specific NICU, the roles and functions of other team members, and the knowledge and skills of the individual therapist" (Gorga, 1994, p. 487) are factors contributing to the variation in NICU staffing models.

The disciplines of speech, occupational, and physical therapy share commonalities in their bodies of knowledge. As a result, overlap exists in the evaluation and treatment domains of the two fields, particularly when working with the highly integrated developmental systems of infants and young children. Despite this overlap, however, each discipline brings to the service of infants a unique and important perspective. It is vital to the effective service to fragile infants in the NICU that we recognize the strengths of each discipline and acknowledge the value in utilizing an interdisciplinary approach with this population.

To explore current patterns of therapeutic staffing in neonatal units in the United States PNW is of value for many reasons. In the current health care climate in the United States, demand for increased care and productivity, at decreased cost, is a reality. For each therapeutic discipline, it is important to have a contemporary description of its roles and responsibilities in the NICU. Finally, a collection of detailed statistics on the presence and variation of therapeutic staff in neonatal units would provide the groundwork necessary for future studies aimed at examining factors such as infant outcomes, unit

efficiency/productivity, or parent satisfaction with their NICU experience. Though studies such as Limperopoulos and Majnemer (2002) and Rapport (1992) have explored some aspects of therapeutic staffing in Canadian and U.S. NICUs, information is scarce with regard to current patterns present in the United States.

The purpose of this study, therefore, was to obtain descriptive data on current trends in therapeutic practices for NICUs in the PNW. Of particular interest was the following information specific to therapeutic disciplines working in the NICUs.

- What are the current staffing models for therapeutic personnel in these neonatal units, and to what extent is occupational therapy involved in the therapeutic care?
- With what evaluation and treatment domains is each therapy discipline involved at its unit?
- What are the factors influencing the current staffing model at each neonatal unit?
- Are therapists satisfied with their roles and responsibilities? What would they like to see done differently at their unit?

It was anticipated that this information would result in three primary benefits to those dedicated to promoting high-quality NICU environments. First, administrative parties, therapists, and consumers might gain an increased awareness and understanding of therapy needs in the NICU. Second, this information would likely be invaluable to therapeutic disciplines working in the NICU for developing practice guidelines, therapeutic skills, and an appreciation for what each can bring to the setting. Finally, such information would lay a foundation for research on the efficacy and outcomes of current practice in this setting.

Method

Participants

As the purpose of this study was to develop a portrait of current therapeutic practice in PNW NICUs, a descriptive design was deemed appropriate. The population of interest were Level II and Level III neonatal units in the greater PNW of the United States. According to the American Academy of Pediatrics (2004), a Level II NICU provides basic care to infants and care to ill babies who are expected to recover rather quickly. A Level III NICU provides basic and Level II care and care to new babies who are seriously ill, undergoing surgery, and/or extremely premature.

Data about this population of PNW NICUs was solicited from therapy personnel working in these NICUs. For the purpose of this study, therapeutic personnel were defined as an SLP, OT, and/or PT working directly with infants and/or families. Respondents met inclusion criteria if they were currently working in the NICU for any amount of time in their work week and had done so for at least 1 year. The states included were Washington, Oregon, and Idaho, as this region was considered an appropriate scope for obtaining a meaningful, localized response. Exclusion criteria for participants included whether the hospital had had an operational NICU for less than 1 year or whether the hospital's neonatal services were not at Level II or III intensity.

It was of primary importance to include all NICUs identified as meeting inclusion criteria in the population list in hopes of capturing a wide diversity of staffing configurations. Using a sampling procedure in this study was not necessary because the population size was 27, and the responses to survey questions were expected to have a high amount of variation. According to Salant and Dillman (1994), to maintain a low sampling error ($\pm 3\%$ or 5%) on a population of 100, the sample size would need to be 92 or higher. With

a population much smaller than 100, as in this case, surveying a mere sample would result in a high sampling error. In addition, given the small population size and the chosen mail survey method, including the entire population was not considered to be a detriment as it would not result in a substantially larger commitment of time and money than if a sample were used.

Instrument

A mail survey was developed specifically for this study, following the Salant and Dillman (1994) method of survey development. The use of a survey allowed the authors to collect a large amount of data over a range of topics in a fairly convenient manner. A preliminary draft of the survey was written, reviewed, and revised based on input from a convenience sample of therapeutic personnel in the neonatal unit of a local hospital and university research committee members. The survey was then pilot-tested with a team of five therapeutic personnel from a PNW NICU that was not included in the final sample. Feedback was sought regarding ease of survey completion, estimated time for completion, and question clarity and relevance. Based on this feedback, survey questions regarding amount of time spent on various evaluation and treatment areas were revised to ask for numbers of hours spent rather than percent of time. In addition, questions were reordered to facilitate flow.

The final version of the survey included primarily closed-end questions with a multiple choice response set and closed-end questions with opportunity to elaborate on one of the multiple choice answers, with two open-end questions to extract qualitative information about the respondent's experience in his or her work setting. Questions in the survey gathered data in the following areas: (a) demographic information about each neonatal unit, including size of unit and level of intensity and how many staff from each therapeutic discipline work there; (b) information about the respondent, such as his or her discipline, years of experience as a therapist, and length of time working in NICU settings; (c) information about how the respondent's time in the NICU was spent, such as in what areas of assessments and interventions he or she was involved, what percentage of time he or she spent doing each, and with what disciplines he or she co-treated to complete such assessments and interventions (information on evaluation and treatment centered on four main areas: feeding, positioning/motor, sensory, and parent education); (d) information about factors influencing the current staffing pattern in his or her unit; and (e) level of satisfaction with the respondent's current role in the NICU.

Procedure

A copy of the consent letter and the survey were sent with an application to the university human subject review board. While awaiting approval by the Board, the population list was devised. The following steps were taken:

1. Lists of hospitals in Washington, Oregon, and Idaho that have NICUs were assembled from the following internet directories: Medline Plus, Washington State Hospital Association, US News hospital search, Health Care Hiring hospital directory, American Hospital Directory, and the American Academy of Pediatrics.
2. A list of Washington hospitals having NICUs was obtained from a local neonatologist who had compiled the list for his own prior use.

3. A single list was then compiled for each state after cross-checking names on all lists for that state to eliminate double entries.
4. When the final list for all three states was determined, each hospital was phoned to ensure that it had a NICU, to inquire whether it utilized therapeutic disciplines in its NICU, and to obtain whenever possible the name of one therapeutic professional from that NICU to whom to direct the mail survey. Hospital receptionists and members of pediatric, rehabilitation, and NICU departments alike fielded phone calls in the author's attempt to reach the appropriate therapeutic personnel.
5. A mailing list was developed consisting of addresses and a contact name for each hospital.

Approval from the university human subjects review board was received prior to the initiation of the survey mailing process. The following steps were then taken:

1. A consent letter, survey, and postage-paid return envelope were mailed to each participant identified during the phone calls. In the case of surveys directed to a rehabilitation manager rather than an employee working in the NICU, the packet also included a brief letter explaining to whom the manager should direct the survey and why. This measure was intended to increase the response rate by reducing the amount of non-responses received.
2. Informed consent for participation in the study was to be assumed by receipt of the completed survey.
3. Eligible participants were asked to complete and return the survey within 2 weeks.
4. After that time, a thank you/reminder postcard was mailed to all participants. The postcard thanked participants for returning their completed surveys if they had done so and, if not, to promptly fill it out and return it.

Data Analysis

Answers to items in the survey were numerically coded to facilitate analysis. Analysis was conducted using SPSS Version 14.0. Descriptive data such as frequency and measures of central tendency and variability were collected on each response. Associations were not explored because of the small sample size. Statistical tests were not run on this small sample as they would not have produced statistical significance. Instead, trends and clinically significant information from questions regarding amount of time spent on various treatment areas and collaboration with other disciplines were obtained through examination of frequencies and measures of central tendency and variability. Open-end questions were analyzed qualitatively, looking for common themes related to respondents' satisfaction with their roles and responsibilities and comments regarding aspects within their particular unit that they would like to see changed.

Results

Twenty-seven surveys were mailed either directly to therapists working in an NICU ($n = 18$) or to the therapy department manager at the hospital ($n = 9$). Two surveys were returned stating that no employee in that department worked in the hospital's NICU, and one participant made contact via e-mail to inform the researcher that there were no therapists working in his department that worked in the NICU. Eight completed surveys were returned and used in the study, representing a total response rate of 44% (12 of 27) and a response rate of 35% (8 of 23) for the purpose of data analysis. Surveys were checked for

completion and inconsistencies in responses on items pertaining to amount of time spent in NICU and amount of total time of respondent's discipline spent in NICU. This was done to decrease risk of measurement error (Salant & Dillman, 1994). All respondents were consistent in their reports of hours worked by themselves and others of their same discipline in the NICU.

Respondent Demographics

Demographics for survey respondents are reported in Table 1. All but 1 of the 8 responding participants were OTs, with the other respondent being a PT. The majority of returned surveys came from Washington and Oregon; one survey was returned from Idaho. Of the 8 respondents, half reported their highest education level as a bachelor degree, and the other half reported holding masters degrees. Respondents had been working in the NICU from 3 to 24 years ($M = 9.9$, standard deviation [SD] = 7.0), and they reported spending from 4 to 25 hr of their work week in the NICU ($M = 15.8$, $SD = 9.6$).

Hospital and NICU Demographics

Neonatal units represented by survey respondents varied greatly in their size and staffing configurations (Table 2). The respondents worked in general, acute, public, private, and university hospitals. Of those respondents reporting hospital size, the number of beds varied from 300 to 625. NICU size was reported as varying from 20 beds to 65 beds.

Current Staffing Models

The amount of time spent in the NICU by each therapeutic discipline varied greatly. The mean hours per week that SLPs spent in NICUs was 6.4 ($SD = 9.6$). Occupational

Table 1
Demographics of survey respondents

Discipline	Frequency	%	State	Highest level				
				Frequency	%	education	Frequency	%
SLP	0	0.0	WA	4	50.0	BS/A	4	50
OT	7	87.5	OR	3	37.5	MS/A	4	50
PT	1	12.5	ID	1	12.5	PhD	0	0

Years in NICU	Frequency	%	Weekly hours in		
			NICU	Frequency	%
1–5	3	37.5	1–5	1	12.5
6–10	2	25.0	6–10	2	25.0
11–15	2	25.0	11–15	1	12.5
16–20	0	0.0	16–20	0	0.0
21–25	1	12.5	21–25	4	50.0

NICU = neonatal intensive care unit.

Note: $N = 8$.

Table 2
NICU size and therapeutic staffing

Each NICU	Type hospital	Size (in beds)		Weekly hours		
		Hospital	NICU	SLP	OT	PT
1	University	—	45	2	40	0
2	General acute	400	30	0	12	0
3	Public	356	26	1	6	1
4	Public	300	20	2	27	0
5	Private	500	48	0	4	16
6	General acute	625	47	24	40	40
7	—	—	65	^a	^a	10
8	General acute	339	40	16	24	8

Note. — = non-response; NICU = neonatal intensive care unit; OT = occupational therapist; PT = physical therapist; SLP = speech/language pathologist.

^aAlthough this discipline does work in this NICU, respondent was unsure of hr/wk.

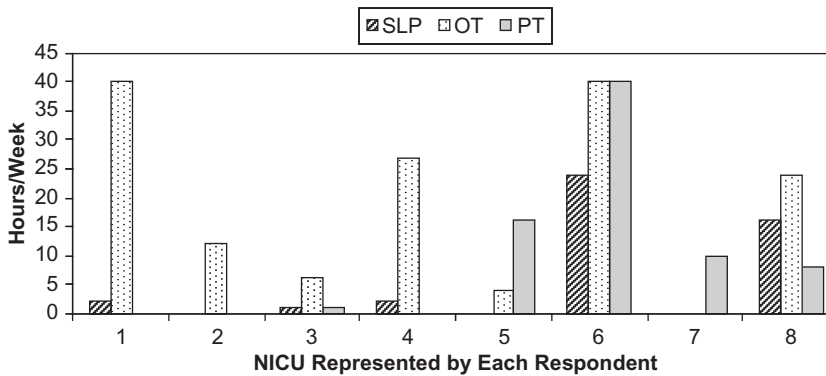


Figure 1. Weekly hours spent in NICU by discipline, per institution.

therapists and PTs reportedly spent means of 21.9 ($SD = 15.0$) and 9.4 ($SD = 13.7$) hr per week, respectively, in NICUs represented by respondents. With the exception of one case, the number of weekly hours spent by OTs in the units was the same or greater than those of other disciplines.

Fifty percent of neonatal units represented by respondents used all three therapeutic disciplines (Figure 1): speech/language pathology, occupational therapy, and physical therapy. One of the units reported using the therapeutic services of OT only; two units use those services of speech therapy and OT. One unit reported using OT and PT. All of the responding neonatal units employed the services of an OT. Seven of the eight respondents were able to report the amount of weekly time spent by other disciplines in their NICU. The total time spent by all therapeutic personnel in the NICUs, per week, ranged from 8 to 104 hr ($M = 37.6$, $SD = 32.8$).

Evaluation and Treatment Areas

When asked which areas of neonatal development respondents were involved in evaluating or treating, 100% of OTs ($n = 7$) reported being involved in all four (feeding, positioning/motor, sensory, and parent education). One respondent added “infrequent splinting” as an area of neonatal need for which they gave treatment. The responding PT reported involvement in the areas of positioning/motor and parent education only. Of all respondents, the minimum to maximum percentages of time reportedly spent working on each of these areas is 0% to 50% ($M = 34$, $SD = 16.3$) for feeding, 16% to 100% ($M = 34.8$, $SD = 28.7$) for positioning/motor, 0% to 25% ($M = 12.38$, $SD = 8.2$) for sensory, and 8% to 100% ($M = 34.8$, $SD = 32$) for parent education.

Transdisciplinary Collaboration

Respondents also reported on transdisciplinary collaboration across evaluation and treatment areas (feeding, position/motor, sensory, and parent education). For the area of feeding, when asked with what other disciplines they worked, the most common combination reported was SLP, OT, and RN ($n = 3$). Other combinations for feeding were OT and RN ($n = 1$); OT, PT, and RN ($n = 1$); and SLP, OT, PT, and RN ($n = 1$). For the infant developmental area of positioning/motor, many combinations of transdisciplinary service were reported. Two respondents reported collaboration among OT, PT, and RN; 2 reported SLP, OT, PT, and RN working together; and 1 OT reported that he or she worked on this area with the RN only. Additionally, 2 OTs reported being the only discipline working on this area.

For the area of sensory integration and development, 2 OTs reported being the only discipline that worked on this area. The remaining respondents reported a variety of transdisciplinary combinations: OT and RN ($n = 1$); SLP, OT, and RN ($n = 1$); OT, PT, and RN ($n = 1$); and SLP, OT, PT, and RN ($n = 1$).

For all treatment areas, 1 respondent reported that either the OT or PT would serve as the primary therapist for an infant—the OT when the concerns for the neonate were primarily feeding and the PT when the concerns were more orthopedic. When asked about delivery of parent education, 75% of therapists ($n = 6$) commented that parents are included in all of their treatments to the extent that the parents are available.

Factors Influencing Staffing Models

Survey respondents were asked which of the following factors were believed to be influencing staffing models at their NICU: training, availability of staff, administrative factors, or other factors. Eight respondents (100%) said training was a factor, 6 (75%) named availability of staff, and none (0%) indicated administrative factors. One respondent wrote that experience was also a factor in the current staffing model of his or her NICU.

Satisfaction with Roles and Responsibilities

Seven of the respondents (88%) stated that they were satisfied with their current roles and responsibilities in the NICU. Of these 7, 3 indicated teaming and teamwork as reasons for their satisfaction. In addition, 2 respondents named rapport with team members and interdisciplinary respect as contributing to their satisfaction with current roles and responsibilities. Finally, 2 respondents mentioned aspects of infant care in their reasons

for satisfaction. One indicated that committee membership to improve care quality for the neonates provided satisfaction; another stated the opportunity for identifying at-risk children as a reason for his or her satisfaction. Two respondents (25%) said they were not satisfied with all aspects of their current roles and responsibilities in the NICU. One of these respondents indicated an inability to “always . . . personally talk with parents” as the reason, and the other expressed a desire for more time in which to adequately address needs, such as “feeding and RN education,” as the basis for dissatisfaction.

When asked whether there was anything that they would like to see done differently in the delivery of therapeutic care in the NICU, respondents provided a variety of ideas. Some respondents discussed factors related to training competencies: 1 stated that he or she would like such competencies developed for new employees, and 1 stated that his or her unit had recently developed competencies based on the American Occupational Therapy Association (AOTA) NICU standards. Other factors mentioned in response to this question included a need for more research and program development; more collaboration between disciplines, namely addition of physical therapy to one unit and an SLP on another for cases involving craniofacial abnormalities and/or complicated swallowing issues; better coordination with parents; and time for community collaboration after discharge, such as for writing letters to community providers, teaching, and providing in-service training.

Discussion

Although this research yielded a small sample size and thus should be interpreted with caution, the many parallels to the results of earlier studies (Limperopoulos & Majnemer, 2002; Rapport, 1992) in Canada and the United States, respectively, give strength to these research findings. As in the Rapport study, the current research revealed that OTs and PTs are most often involved in treating the same areas of need in an NICU. Limperopoulos and Majnemer found the same overlap but with OTs more often doing splinting and feeding and PTs doing chest physiotherapy and range of motion. All three studies reported OTs and PTs both working in NICUs, and two of the three reported collaboration between the two disciplines (with the exception of the Canadian study). In addition, the present research found that SLPs are often involved in this collaboration as well.

Current Staffing Models

As suspected, respondents depicted many variations of therapeutic staffing models in their neonatal units. Though half of respondents stated the use of all three disciplines in their NICU, the other half portrayed combinations of SLP and OT, OT and PT, and OT only. The variation found in therapeutic staffing models with these results from PNW NICUs is consistent with that found by Limperopoulos and Majnemer (2002) for Canadian NICUs. However, Canadian NICUs reported a lower percentage of SLP involvement (13%, 5 of 38). In this current research, each unit represented by the returned surveys utilized an OT, and in all but two cases (one where the amount of time spent by OT was unknown and one where the PT spent more time in the NICU than the OT), the OT spent more time than other disciplines treating infants and their families in the NICU. There were no surveys returned by SLPs, and there were no surveys returned that described the use of SLP and PT services without OT in their NICU.

Evaluation and Treatment Areas

As respondents to this survey were OTs ($n = 7$, 88%) and a PT ($n = 1$, 12%), the authors can speak only about evaluation and treatment areas of these two disciplines, as represented by current research participants. True to the strengths of his or her discipline, the PT reported working on positioning/motor needs of the infants, and he or she reported doing this in conjunction with the OT, RN, and parent. As for OT involvement, it was not surprising to find in the survey responses from the OTs ($n = 7$) that each reported being involved in all four areas of infant development listed (feeding, positioning/motor, sensory, and parent education). This response depicts the holistic nature of OT services and is consistent with the domain and scope of practice published by the AOTA for all OTs (2002) and those working in the NICU (2000). One respondent described using a strength of the discipline in her NICU: “As an OT, I use my skills in explaining techniques to parents/staff so they are easily understood.”

Transdisciplinary Collaboration

Although this current research produced a sample of respondents who were largely OTs, this response does not appear to translate into occupational therapy’s being the primary therapeutic service in many of these NICUs. Many respondents described a strong transdisciplinary service model in their units. These units appear to operate with each therapeutic discipline able to address each of the areas of infant development, as needed. Care for neonates is transferred among disciplines as necessary. The respondents describing this model emphasized respect for each discipline’s scope of practice and each individual’s strengths and areas of expertise. The following comment from a respondent demonstrates this respect:

Our speech therapist/OT/PT highly acknowledge each other’s specialties, however, we are all expected to address the babies’ feeding, positioning, handling, parent ed, sensory issues. Each [provides] care within our comfort and scope of practice. Example where [treatment is separated]: speech therapist—swallow studies, OT—splinting, PT—club foot, taping, etc.

In cases wherein the OT has reported being the only one treating in these areas of infant care, she or he reported having the vast majority of hours in the NICU over the other disciplines. Where there are other disciplines working in the NICU, the OT commonly reported collaborating with the SLP for feeding and the PT for positioning/motor needs. The vast majority of respondents ($n = 7$, 88%) reported collaborating with the RN for either all of their service delivery or for feeding treatment only. One respondent reported the existence of a primary therapist system in his or her NICU, whereby the incoming referral gets routed to OT and PT, and the therapists decide which of them is best suited to be the primary therapist depending upon the individual case. Interestingly, this respondent also reported the highest total number of hours spent by each discipline in his or her NICU, with the SLP, OT, and PT spending 24, 40, and 40 hr per week, respectively. One might assume that the “primary therapist” model is utilized as the result of limited availability of therapists in the NICU; however, that assumption does not fit in this case. The results from this respondent suggest that this model may be utilized because it leads to better services for the neonates and families. Outcomes resulting from this and other types of

transdisciplinary models of service delivery are an important topic for further research for this population.

Respondents reported many variations of collaborative service models in their NICUs. The transdisciplinary nature of services provided in responding NICUs was similar to the results found by Rapport (1992), in which OT and PT had similar roles in some neonatal units.

Factors Influencing Staffing Models

Factors indicated as influencing current staffing models were training of employees, availability of staff, and experience of staff members. Respondents were not asked to elaborate on their responses; therefore, it is difficult to know what specific factors were considered influencing. For instance, when listing availability of staff as a factor, the respondent could be referring to a staffing shortage, administrative limiting of staff, or simply a shortage of time that disciplines are allotted in the NICU. Interestingly, none of the respondents indicated administrative factors as influencing staffing configurations. This could contradict some factors listed, as administrative decisions do play a part in all factors listed.

One respondent described a situation wherein other employees (an SLP and a second OT) wanted to be involved in NICU service but were limited by their inexperience. As a result, they were called to service only when the primary OT was unavailable. Another respondent commented that he or she felt that working in the NICU was a “specialized area and requires much extra training and mentoring.” He or she suggested the following areas for such training/mentoring: knowledge of neonatal care and handling, parent collaboration, and transdisciplinary service delivery. The findings from this study reinforce the conclusions of Gorga (1994) that competence of individuals and current staffing climate and configurations in an NICU are highly significant factors in determining who should provide therapy in any given unit. These findings are also consistent with documents published by ASHA (2004), AOTA (2000), and Sweeney, Heriza, Reilly, Smithy, and VanSant (1999) on behalf of PTs that emphasize the importance for each discipline to have specialized NICU skills and knowledge to appropriately and effectively deliver service to this population.

As described in many comments by respondents, having a positive rapport with nursing staff is very important. In fact, one respondent believes that having experience working with physicians and allied health personnel is “critical” for success. Given the high amount of collaboration with RNs reported by respondents, being able to establish rapport with the medical staff also appears to be a crucial element in staffing configuration.

Satisfaction with Roles and Responsibilities

Therapists who reported using a transdisciplinary model in their NICU service delivery also reported being very satisfied with their roles and responsibilities. A strong sense of team, seamless care, and good rapport with staff were all listed as reasons for respondents’ satisfaction. These statements support the suggestion that service delivery in the NICU is best operated as a highly collaborative environment in which members cross-train, share responsibility, and acknowledge each other’s strengths and specialty areas. Respondents who were not satisfied with their roles and responsibilities in the NICU described issues related to an inadequate amount of time for proper service delivery to infants and families.

Comments about what respondents would like to see changed in their NICUs revolved around the same topics of specialized training for employees and collaboration with other

professionals. One respondent believed it important to structure training for new employees by developing competencies based on AOTA's (2000) standards. Other respondents said that inclusion of speech/language pathology services, parents, and a PT would improve service delivery in their NICUs. These responses provide further support to the suggestion that a transdisciplinary model of service is preferable.

Implications for Occupational Therapy

Findings from this research illuminated the highly specialized and collaborative nature of service to neonates. Occupational therapists wishing to work with this population should seek additional training in specific knowledge and skills appropriate for neonates. Additionally, hospital administrators should recognize the need to provide employees with opportunities to receive training and mentorship that will ensure their effectiveness in the role of OT in the NICU. This research also provides an increased awareness of the nature of service delivery in the NICU. This awareness is vitally important to administrators, therapists, and consumers alike, for with it they will better be able to understand and begin to shape services in the NICU to be most effective for the neonate.

It is important for SLPs, OTs, and PTs reading this research to recognize the significance of transdisciplinary service delivery for this population. Regardless of the reader's discipline, it is necessary for him or her to recognize his or her own strengths, the strengths and scope of practice of his or her discipline, and the strengths and scope of practice of other disciplines working in his or her NICU. Doing so will encourage cross-training by disciplines on the highly integrated neonatal developmental system. This will also produce a transdisciplinary model of service delivery that will ultimately provide neonates with the most appropriate and specialized care.

Limitations of Study

Results should be interpreted with caution for many reasons. First, the number of respondents in this research is quite small. Because the researcher desired to obtain a very localized response that provided her with a small population, results obtained by the responding sample should be cautiously generalized to the broader population.

Second, there exists possible bias resulting from population identification. Although attempts were made to increase response rate by phoning hospitals to get a participant's name to put on the mailing, in doing so the researcher may have created sampling error. By identifying herself as a member of the OT program at her university, the people providing the researcher with the name of any therapeutic discipline working in their NICU may have been more inclined to provide the name of an OT, even when other disciplines were working at that unit. This could account for the high number of OTs who responded to the survey.

Finally, there is the possibility of non-response error in the results of this survey (Salant & Dillman, 1994). Although the survey was sent to SLPs, OTs, and PTs, it was returned primarily by OTs and by one PT. Perhaps the OTs who received the survey were more inclined to contribute their experience because the researcher had identified herself as an OT. Additionally, with health care professionals' having busy schedules and being pressed for time, it is less likely that a discipline other than OT would prioritize completing this survey than if it were for his or her own discipline.

Suggestions for Future Research

This research has revealed much variation in staffing configurations for therapeutic services in PNW NICUs. It would be of great value to examine neonatal outcomes related to these various models. Not only would an understanding of the effects of particular service delivery models be of benefit to those serving the neonatal population but the information could be well utilized by administrators in making staffing decisions. Further research on the factors influencing staffing configurations, such as specific skills needed by therapists in the NICU and factors influencing availability of appropriate staff members, would be important, especially for units that may be experiencing difficulty in obtaining staff members.

Second, respondents in this research provided many comments on varying availability of parents to participate in their children's neonatal care. Future studies focusing on parents' perspectives of care received by their neonates and their own inclusion or involvement in their child's care would be valuable for providers of service to infants in NICUs. Finally, it would be of great value to conduct research exploring successful collaborative and transdisciplinary NICU teams to uncover positive features of their models for replication in all neonatal units.

Conclusion

Neonates are a fragile population who experience complicated developmental patterns as a result of their early medical needs. OTs are well suited to treat neonates in an NICU, as are SLPs and PTs. Each of these therapeutic disciplines has specific skills and overlapping skills that contribute to the growth and development of babies in the NICU. Collaboration between these disciplines is valuable as each comes from a different perspective. When PNW NICUs were surveyed, it was found that indeed there is much variation in therapeutic staffing models, with disciplines working on many of the same developmental needs and having much collaboration. Training and collaborative skills were identified as crucial for those working in NICUs, and the recognition of the strengths of each therapeutic discipline and the value of transdisciplinary service delivery was highlighted. Attention to these issues will enhance best practices in NICU care for neonates and their families, both during their NICU stays and in the critical development years to follow.

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