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MCH Professional Development

Interdisciplinary Leadership Training Outcomes of Maternal and Child Health-Funded Pediatric Pulmonary Centers

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Objectives: To describe career paths, leadership accomplishments, and extent of incorporation of Maternal and Child Health Bureau (MCHB) values into professional activities of all previous long-term trainees. *Method*: In 1998 the Pediatric Pulmonary Centers (PPCs) completed a Leadership Training Outcomes Survey of all previous long-term trainees. The survey included 1) characteristics, 2) career paths, 3) current professional activities, 4) leadership roles and activities, and 5) career incorporation of MCHB values. *Results*: There was a 63% response rate ($N = 274$) from 431 mailed surveys. Most respondents provided clinical care in varied health-related settings. Of the respondents, 44% ($N = 120$) served mothers, 87% ($N = 239$) served children, and 78% ($N = 214$) served children with special health care needs. Forty-seven percent of the mothers and children served were from racial or ethnic minority groups. Ninety-two percent ($N = 252$) of respondents had conducted training since graduation and 56% ($N = 153$) had provided technical assistance. Many provided leadership in the acquisition and dissemination of new knowledge through research publication (33%), advocacy (37%), and program administration/oversight (87%). Thirty percent of the respondents ($N = 83$) had received special recognition awards for professional activities. *Conclusions*: Most PPC graduates serve families and children as a central aspect of their career, providing or enhancing family-centered, community-based, culturally competent, comprehensive interdisciplinary care.

KEY WORDS: Pediatric Pulmonary Center(s); leadership training; interdisciplinary training; survey; outcomes.

INTRODUCTION

The Pediatric Pulmonary Centers (PPCs) are interdisciplinary training programs funded by the Maternal and Child Health Bureau (MCHB) to serve children with special health care needs who have respiratory disorders. The seven PPCs constitute one of 14 categories of training under the direction of the MCHB, which is part of the Health Resources and Services Administration within the U.S. Department of Health and Human Services. The PPCs and other training programs are Special Projects of Regional and National Significance (SPRANS) grants from the MCHB under Title V of the Social Security Act and are distinct from Maternal and Child Health block grants to each state.

The mission of the PPCs is to develop leaders who will improve the health of children with respiratory

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conditions through the provision of family-centered care. PPCs have both specialty certification programs for physicians and masters degree programs for health care providers in nursing, nutrition, social work, and respiratory care. PPC masters degree trainees spend at least 300 h focusing upon the development of skills and abilities which fall under five major goals of PPC training: 1) leadership skills in research; 2) expertise in family-centered, community-based, culturally competent, comprehensive interdisciplinary systems of care; 3) teaching; 4) advocacy; and 5) program and policy development. Physician trainees receive pediatric pulmonary specialty certification through a 3-year fellowship training experience in medicine.

There have been no previous national systematic assessments of this form of MCH graduate training in the health care disciplines. In response to the Government Performance Results Act (GPRA) of 1993 (Public Law 103-62), the PPCs identified the need for a competency framework specific to professional preparation of leaders in interdisciplinary pediatric pulmonary care. Achieving consensus on training competencies first involved a compilation of existing knowledge and practices in the area of leadership competencies followed by a consensus-building process at each collaborating site on what the core competencies ought to be. With input from each PPC, a cumulative list of 57 competencies was compiled. Using a modified Delphi Technique, those 57 competencies were condensed to 14 core competencies and more than 60 competency-specific outcome measures. Following this, the PPC faculties convened a national meeting to ratify the competencies and assign priority ratings to both the competencies and outcome measures using the Nominal Group Technique and Modified Focus Group strategies. These outcome measures helped to define the competencies and served as indicators of success, reflecting the attributes perceived as valuable and relevant by program leaders, faculty, and funding agencies.

Participants reported a high degree of satisfaction with the entire process, which took approximately 6 months, and its outcome. The outcome measures given highest priority were included in the Leadership Training Outcomes Survey (LTOS), which was developed within the year and implemented the following year. This paper describes the results of this survey, which was sent to all trainees ($N = 431$) who had completed at least 300 h of instruction and consisted of 24 multiple-choice/fill-in-the-blank questions. The LTOS results provided programmatic evaluation and describe both the career paths and leadership accomplishments of new and career-mature graduates as well as the extent to which values fostered by the MCHB have been incorporated into the professional activities of trainees after graduation.

This unique consensus development process enabled a large group of people located at geographically dispersed sites to collaborate efficiently and effectively, producing competencies, outcome measures, and an evaluation instrument that are markedly innovative contributions to the understanding of interdisciplinary pediatric healthcare leadership development. This study represents the first comprehensive description of leadership outcomes of trainees served by a Maternal and Child Health Bureau-funded training program and establishes a foundation that can be used by those in both the academic and practice sectors of other public health and health provision arenas.

METHOD

The survey instrument was developed collectively by the seven PPCs with input from a consultant in the field of education development and another in statistics and measurement. The faculty from all centers reached consensus on domains of interest, competencies expected of all trainees, and specific quantitative outcome measures. The survey tool was pilot tested twice to assure clarity, consistent interpretation of responses, and that the length of time for survey completion was not excessive.

The LTOS reflected the five major goals of PPC training and had five aims: 1) describe characteristics of PPC graduates by discipline, years since graduation, and training center; 2) delineate the career paths taken by graduates, including the degrees and certification status achieved; 3) specify the current professional activities in which PPC graduates were engaged including current positions, practice settings, and populations served; 4) characterize the leadership roles and activities of PPC graduates, including the provision of education and training for students and colleagues as well as technical assistance activities provided on a local, state, regional, and national scale; and 5) determine if MCHB values have been incorporated into PPC graduates' career activities.

A Pediatric Pulmonary Trainee Registry was created with input from each center. Trainees receiving at least 300 h of instruction from all health disciplines who had graduated within the previous 20 years were identified. Only graduates trained within the previous

Table I. Response Rates and Discipline of Respondent by Center

			Respondents by discipline: *N* (%)				
Center	Total surveys sent	Response rate: *N* (%)	Medicine	Nursing	Social work	Nutrition	Other
A	43	37 (86)	7 (19)	7 (19)	9 (24)	12 (32)	2 (5)
B	102	48 (47)	11 (23)	8 (17)	3 (6)	26 (54)	0 (0)
C	35	28 (80)	4 (14)	9 (32)	6 (21)	9 (32)	0 (0)
D	27	19 (70)	5 (26)	2 (11)	6 (32)	5 (26)	1 (5)
E	80	65 (81)	10 (15)	17 (26)	14 (22)	15 (23)	9 (14)
F	89	39 (44)	27 (69)	3 (8)	3 (8)	6 (15)	0 (0)
G	55	38 (69)	10 (26)	7 (18)	7 (18)	12 (32)	2 (5)
Total	431	274 (64)	74 (27)	53 (19)	48 (18)	85 (31)	14 (5)

20 years were surveyed, as the priorities of MCHB training nationally were evolving over time. Only graduates of long-term programs (>300 h) were surveyed; those receiving less exposure were less likely to have sufficient training to have had a documentable impact. Each trainee entry in the registry included name, identification number, center affiliation, mailing address, and dates when surveys were mailed and returned. Completed surveys were mailed to the national PPC Database Center where responses were entered and stored in a separate database using only respondent identification numbers for data analysis. Following the initial mailing, which included a cover letter from the Director of the PPC in which they were trained, up to two additional "reminder" surveys and cover letters were sent, to improve response rate, for a total of up to three mailings. Trainees were asked to report only on the time period following the completion of their PPC training. Data collection occurred over a period of approximately 8 months.

Data were analyzed using SAS-PC v6.12 software that included error-checking features such as out-of-range responses and response skip patterns. Besides reporting descriptive statistics such as percentage of responses to each option we also analyzed, for selected variables, whether there were differences in responses depending upon site of PPC training (seven PPCs, A–G) and how long it has been since the respondent graduated from the program (≤5 years or >5 years). The statistical significance of the differences in these variables was tested using the Chi-square test for independence.

RESULTS

The seven PPCs identified a total of 431 eligible graduates, 274 (63.5%) of whom completed the survey. Aim 1 of the LTOS provided descriptive data regarding the characteristics of the respondents. Aims 2–5 assisted in identifying the extent to which PPC graduates had achieved the five major goals of PPC training. The characteristics and professional activities sample/response rates follow.

Aim 1: Characteristics

Table I shows the response rates and discipline of respondent by center. Response rates varied from 44 to 86% by center; no center accounted for more than 24% of all respondents. The percent of respondents from medicine, nursing, social work, and nutrition ranged from 18 to 31% ($N = 48$–85). Graduates in respiratory care, physical therapy, and pharmacy constituted 5% ($N = 14$) of respondents. Respondents resided and practiced in 38 different states.

Aim 2: Career Paths

One hundred percent ($N = 48$) of the social work graduates, 86% ($N = 73$) of the nutrition graduates, 96% ($N = 51$) of the nursing graduates, and 89% ($N = 8$) of the physical therapy and respiratory care graduates had obtained masters degrees. Five percent ($N = 4$) of the nutrition graduates had received doctoral degrees. Sixty-nine percent ($N = 51$) of the medical graduates had obtained pediatric pulmonary certification from the American Board of Pediatrics. The remainder ($N = 23$) were sub-board eligible at the time of the survey.

Aim 3: Current Professional Activities

Table II lists the percentage of time spent in different professional activities and the settings in which graduates practice. More than one answer could be chosen if the respondent practiced in multiple

Table II. Current Professional Activities by Time Allocation and Settings

% time in each activity	Settings of professional practice[a] (%)
Clinical care 55	Hospital based 53
Education 17	Education facility 32
Administration 12	Ambulatory care 31
Research 8	Tertiary care 30
Technical assistance 5	Community based 12
Other 3	Other 10

[a]Respondents could answer more than one option if practicing in multiple settings.

settings. Respondents spent most of their time providing clinical care to target populations (mean = 55% of time). Of 274 respondents, only 18% ($N = 48$) were not providing clinical care of any kind at the time of the survey. Professional settings varied but included hospitals (53%), universities or colleges (32%), and community-based ambulatory care settings (12%).

The survey also asked respondents to characterize the patient populations they have served since graduation. Table III presents the results for these questions subdivided according to the length of time since graduation ($\leq$5 years or >5 years). Forty-four percent ($N = 120$) of respondents addressed the health care of mothers, 87% ($N = 239$) served children, and 78% ($N = 214$) served children with special health care needs. Forty-seven percent of the mothers and children served were from racial and ethnic minority groups. As one would expect, the longer it had been since the respondent graduated, the more likely they were to report having served the needs of a broad range of populations. And, those with >5 years since graduation were significantly more likely to have served children with special health care needs ($p = 0.004$).

Aim 4: Leadership Roles and Activities

Four types of leadership roles and activities were assessed: 1) provision of education and training for students and colleagues, 2) professional service and scholarship, 3) provision of technical assistance, and 4) administrative positions held and advocacy activities undertaken.

- Provision of education and training for students and colleagues: Table IV, Column 1 depicts the scope of respondents' efforts in the provision of education and training for students and colleagues in clinical practice who care for mothers and children. Training activities identified by the graduates included formal classroom education activities for students ranging from elementary school to postgraduate university levels, oversight of clinical practicums, continuing professional education, and training of individuals in the public sector, e.g. community organizations, government agencies, and schools. Twenty-four percent ($N = 65$) of respondents had conducted training on a national level. Only 20 PPC graduates (7%) had not conducted training since graduation.
- Professional service and scholarship: Most notably, 30% ($N = 83$) of respondents had received special recognition or awards for their professional activities. Awards were obtained for clinical excellence, community involvement, and professional leadership in about equal proportions. Scholarship activities included 68% ($N = 185$) of graduates creating guidelines for care and/or practice, 33% ($N = 91$) publishing and writing articles, 18% ($N = 60$) writing book chapters, and 53%

Table III. Patient Populations Served According to Length of Time Since Graduation

	# Years since graduation		
	5 years or less ($N = 86$)	>5 years ($N = 107$)	p-value[a]
Patient populations served			
Mothers (%)	42	46	NS
Children (%)	83	89	NS
CSHCN (%)	67	85	0.004
Racial and ethnic minority groups			
% of patient population served that is non-White	53	47	NS

[a] p-value based on Chi-square test of independence with 1 df.

Table IV. Scope of Training Activities and Technical Assistance of PPC Graduates

Scope of leadership activities	Training[a] (%)	Technical assistance[b] (%)
Local	67	90
State	40	50
Regional	29	31
National	24	18
International	12	5

Note. Percentages reflect proportion reporting each category of those who had provided training or technical assistance.
[a]Two hundred fifty-four of 274 respondents have provided training.
[b]One hundred fifty-three of 274 respondents have provided technical assistance.

($N = 144$) producing brochures to further train health care professionals and/or families. Specific to research, 34% ($N = 94$) had supervised trainee research and 49% ($N = 133$) had collaborated on research projects after graduation. Seventeen percent ($N = 46$) had reviewed articles for peer-reviewed journals and 11% ($N = 30$) had reviewed grants for government agencies.

- Provision of technical assistance: Technical assistance (Table IV, Column 2) includes expert advice and consultation that does not pertain to individual children or families but addresses programs, policies, and systems of care. Some form of technical assistance was provided by 56% ($N = 153$) of 274 respondents after graduation. Of those who provided technical assistance, 43% ($N = 66$) had assisted government programs, 41% ($N = 62$) had assisted schools and universities, and 34% ($N = 52$) had assisted professional organizations and community agencies. The technical assistance they provided pertaining to systems of care for mothers and children was often on a state (50%) or regional (31%) level. However, several respondents had provided technical assistance at the national (18%) or international (8%) level.
- Administrative positions held and advocacy activities undertaken: Leadership roles and advocacy activities were major achievements. Eighty-seven percent ($N = 237$) of 274 respondents were engaged in some aspect of program leadership and administration. Forty-eight percent ($N = 131$) had conducted program or personnel evaluations; 42% ($N = 116$) had served in a managerial role; and 46% ($N = 127$) had participated in strategic planning for a program, department, school, or agency. Advocacy was also an important activity of graduates. Thirty-eight percent ($N = 103$) of respondents had contacted legislators; 19% ($N = 53$) had participated in health care advocacy group coalitions, and 17% ($N = 46$) had attended legislative hearings. When these items were analyzed according to the years since graduation, those with >5 years experience postgraduation were significantly more likely to have engaged in these activities: conducted program or personnel evaluations (χ^2 (df = 1) = 7.67, $p = 0.022$); served in a managerial role (χ^2 (df = 1) = 11.01, $p = 0.004$); participated in strategic planning for a program, department, school, or agency (χ^2 (df = 1) = 8.71, $p = 0.013$); and contacted legislators (χ^2 (df = 1) = 12.26, $p = 0.002$).

Aim 5: Career Incorporation of MCHB Values

In addition to leadership, the MCHB promotes family-centered, community-based, culturally competent, comprehensive interdisciplinary health care for families and children, including children with special health care needs. As this is one of the five major goals of PPC training, the LTOS included items to determine if PPC graduates incorporated these critical attributes of health care delivery into their professional activities.

- Family-centered care: Eighty percent ($N = 218$) of graduates had included families in health care planning decisions and 35% ($N = 95$) had trained other health professionals in family-centered care.
- Community-based care: Forty-one percent ($N = 112$) of respondents had created linkages with primary care groups in community-based settings and 50% ($N = 137$) had made health-related presentations directly to community groups.
- Cultural competence: Of particular importance, 33% ($N = 90$) of respondents had worked toward the elimination of health care disparities by developing culturally appropriate materials, programs, or services.
- Interdisciplinary care: Of 274 respondents, 83% ($N = 226$) had participated as a member of an interdisciplinary health care team, 26% ($N = 72$) had led such a team, and 19% ($N = 52$) had developed an interdisciplinary team.

DISCUSSION

The training programs funded by the MCHB represent a unique blend of training priorities for graduate students in the health care professions. With a focus on the health of mothers and children, including children with special health care needs, the five major goals of PPC training are 1) leadership skills in research; 2) expertise in family-centered, community-based, culturally competent, comprehensive interdisciplinary systems of care; 3) teaching; 4) advocacy; and 5) program and policy development. Graduates of these training programs are expected to accomplish career goals that express an attainment of these goals. This is the first comprehensive follow-up study of a MCHB training category, which included all seven of the PPC training programs in the country.

Several results are important indicators of the success of these programs. First, the vast majority of graduates continue to serve families and children as a central aspect of their career. The typical graduate has served children with special health care needs, such as children with chronic respiratory conditions, includes families in health care decision making, and has participated as a member of an interdisciplinary health care team. In addition, a substantial proportion of graduates have trained other health care providers about family-centered care, developed health care teams where none had previously existed, developed linkages with communities to enhance care for children with chronic respiratory conditions, and developed materials to address cultural competence. Even if we assume the worst case scenario, that nonresponders achieved none of the five major goals of PPC training, over half of the graduates are engaged in either training or some aspect of program leadership and administration. Thus, we are fairly confident that well over half of the graduates are engaged in activities that express attainment of at least one of the five major goals of PPC training. This is a conservative estimate and it is likely that substantially more graduates are contributing to achieving the MCHB objectives of providing or enhancing family-centered, community-based, culturally competent, comprehensive interdisciplinary care for children with special health care needs.

Second, as graduates of programs which are SPRANS, respondents now reside and practice in more than 35 states, thereby impacting health care programs throughout the United States. Not only does the presence of a PPC graduate in an organization directly impact health care programs, but large numbers of graduates are engaging in the multiplier effect of providing training. PPC graduates are providing training and technical assistance on a state and national level. These services have been provided by trainees in all of the PPC disciplines including medicine, nursing, nutrition, social work, respiratory care, and physical therapy. The graduates of the PPCs are, therefore, providing program expertise that has both regional and national impact.

Third, the survey demonstrates that leaders emerge from the PPC training programs. Many current medical and health care professionals have received little or no formal management and leadership training (1–3). Increasingly, the ability to provide quality health care involves the ability to work effectively on a team made up of a wide variety of medical and health-related disciplines with very different skills and perspectives (4–6). The importance of nonmedical leadership training is well documented (7–9). Pediatric Pulmonary Centers recruit and train leaders, providing innovative training mechanisms for graduates in multiple health disciplines to develop and exert their leadership in the field of health care for mothers and children. Many expressions of PPC training goal attainment can be made early in a trainee's career; however, leadership skills and the opportunities to express those skills tend to grow more at the rate of a developing career, even with the tools that PPC training provides. Therefore, a systematic time-since-graduation analysis was only done for Aim 4 of the LTOS, which dealt specifically with leadership roles and activities.

Graduates of the PPCs have influenced other health care professionals through research, training, advocacy, administration of programs, and technical assistance. At the time of the survey, many had received awards or special recognition for professional accomplishments, had authored research articles, and had developed clinical guidelines for care. Additionally, a large number of PPC graduates have assumed managerial or administrative roles, have been engaged in administrative activities, and have participated in strategic planning and managerial oversight of programs.

Fourth, the PPCs also represent an example of an interdisciplinary leadership training program for health care professionals. Interdisciplinary leadership training goes a step beyond leadership training. An interdisciplinary team identity supercedes individual identity. Interdisciplinary teams share goals and work interdependently in all phases of goal setting and attainment. Team members share leadership roles and

the ways in which team members interact are important since they affect teamwork and outcomes. Interdisciplinary training is defined as "... an integrated education program involving the interdependent contributions of the several relevant skills and understanding of the attitudes, values and methods of participating disciplines" (10). The study showed that the majority of graduates had participated as a member of an interdisciplinary team, one quarter of them had led such a team, and a significant number of them had developed an interdisciplinary team.

The primary limitations of this study are the relatively low response rate (63%), the reliance on self-report, underreporting due to time limitations, and the inability to make controlled comparisons. We did not have access to information on nonresponders and cannot describe how they differed from responders. Because the response rate was not uniform across all PPC sites (range from 40 to 86%), some sites are overrepresented while others are underrepresented. There may be features of different sites that make them more or less effective and this may have interacted with the response rates in some unknown manner. A conscious decision was made to provide descriptive, not comparative, information. This was not a contest but an attempt to report the impact of PPC training as a national network and entire category of MCHB-funded training programs. It was expected that results would differ widely between PPCs and disciplines. Individual PPC results were distributed to each individual PPC for the purposes of internal program evaluation only. Despite these particular limitations, this survey presents the first detailed picture of interdisciplinary leadership training outcomes of MCHB-Funded PPCs and represents a baseline set of outcomes which can be used by other programs or by the same PPCs over time for comparison.

What Orne referred to as Demand Characteristics is a commonly acknowledged research design problem for self-report studies where respondents tend to give answers that they feel researchers want to hear (11). The survey asked about activities that were a clearly understood goal of the PPC program they attended. The reliance on self-report could mean that our results tend to be overly optimistic in terms of graduates' activities in support of the five training goals. Without undertaking a very labor intensive verification of those activities that could be independently verified, the extent of overreporting cannot be determined.

The PPC program is meant to impact the entire career of graduates, not just the subsequent few years after graduation. Very few graduates had reached the age of retirement, so their careers were still unfolding as we administered the survey. We documented that respondents who were within 5 years of graduation demonstrated fewer activities than those who had been out longer. It may be premature to judge the effectiveness of the PPCs on the basis of these partial careers, but the reality is that this must be the case for any such type of program. It probably should be considered encouraging that substantial numbers of such "works in progress" self-report that they are actively engaged in activities aligned with the training goals of the PPCs.

The inability to make controlled comparisons makes the responses to the survey difficult to objectively interpret. Whether the rates of participation in activities associated with the training goals of the PPC are any different for PPC graduates than for health care providers who have not participated in a PPC program is unknown. This forces us and the readers to make subjective assessments of whether the self-report rates of participation by graduates constitute a sufficiently desirable outcome. We believe these rates are sufficient and desirable because of the nationally recognized need for leadership in the areas addressed by PPCs. The framework and results of the Leadership Training Outcomes Survey provide a baseline for similar studies in non-PPC training institutions.

In summary, the effort to evaluate the results of the PPC efforts in terms of the activities of graduates represents a positive step in the direction of accountability. Where there has been substantial financial investment in the education and training of future leaders, there should also be research, tracking, and evaluation of those leaders and the programs from which they emerge. The survey addresses the Government Performance Results Act (GPRA) of 1993 (Public Law 103-62) insofar as it provides positive evidence related to the results of government investments in health care training. The results of this survey document that leaders in health care do indeed emerge from these training programs and that they serve mothers and children.

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