

Interprofessional Educational Partnerships in School Health for Children with Special Oral Health Needs

Charlotte Connick Mabry, R.D.H., M.S., F.A.D.P.D.; Nicholas G. Mosca, D.D.S.

Abstract: Dental caries is an infectious yet preventable disease that is rampant in some subpopulations in the United States, in particular among individuals with neurodevelopmental/intellectual disabilities (ND/ID). This article reports on the implementation and evaluation of the Louisiana State University Health Sciences Center (LSUHSC) School of Dentistry interprofessional school health educational model to improve oral health assessment and referral for children with ND/ID in an inner-city school system. During this project, dental hygiene students and elementary school nurses were paired to assess the oral health status of 255 inner-city children with developmental disabilities, improve referral/access to dental care for those identified as having need, and propose dental hygiene curriculum changes that would incorporate participation in a “real-life public health setting” for those with ND/ID. Following the program, 66 percent of dental hygiene students said their likelihood of participating in future oral health programs had increased and 75 percent of school nurses rated the educational process as very good or excellent. Modifications in dental hygiene curricula that provide students with training and experience in oral health risk assessment and referral for people with ND/ID is recommended to address the new Commission on Dental Accreditation educational standards 2-18 and 2-26 (implemented January 1, 2005) and dental standard 2-26 (implemented January 1, 2006), which state that dental hygiene and dental graduates must be competent in assessing the treatment needs of patients with special needs.

Ms. Connick Mabry is Associate Professor, Louisiana State University Health Sciences Center School of Dentistry, as well as a board member of Special Care Dentistry Association, President of the Academy of Dentistry for Persons with Developmental Disabilities, a dental public health program planner for the Louisiana Developmental Centers, and Louisiana coordinator of the Special Olympics Special Smiles Program; Dr. Mosca is Dental Director of the Mississippi Department of Health. Direct correspondence and requests for reprints to Ms. Charlotte Connick Mabry, Louisiana State University Health Sciences Center School of Dentistry, Advanced Education and Hospitals, 8000 G.S.R.I. Avenue, Building 3110, Baton Rouge, LA 70802; 225-334-1791 phone; 225-334-1794 fax; cconni@lsuhsc.edu.

Key words: persons with neurodevelopmental/intellectual disabilities, underserved populations, access to oral health care, elementary school nurses, dental hygiene curriculum, interprofessional education

Submitted for publication 12/21/05; accepted 4/27/06

Utilization of dental services in the United States is highest among those with the least disease.¹ Dental caries is an infectious yet preventable disease that is near epidemic proportions among populations that lack access to dental services, specifically the 20-25 percent with low socioeconomic status where 80 percent of dental disease occurs.² The American Academy of Pediatrics supports the belief that neurodevelopmental/intellectual disability (ND/ID) places individuals at even higher risk for dental caries.³ We have found through our own experience that treating children with ND/ID, medical, pharmaceutical, and behavioral factors creates complex needs that may heighten susceptibility to dental disease.

Alarming, it is apparent that predoctoral training in the health care of individuals with developmental disabilities is inadequate in both the medical and dental curriculum. Disabled persons exhibit poorer oral hygiene, more severe periodontal disease, more

decayed tooth surfaces, and greater treatment needs than persons without disabilities.⁴ In 2005, Hood and Holder conducted a Curriculum Assessment of Need, or “CAN Project,” with the Special Olympics to identify the level of training and clinical experience that health professions students received for care of patients with ND/ID.⁵ This project surveyed more than 2,500 U.S. medical and dental school deans, students, residency directors, and organizations that provide health care for people with ND/ID. The survey revealed little to no clinical training experience for students with individuals who have ND/ID. Survey respondents said there were few incentives to provide this training in comparison with other education priorities, and over 81 percent of medical school faculty responding cited “a lack of curriculum time” as the primary reason for not training students. Yet nearly 74 percent of medical students showed an interest in having more education in treating people with ND/ID.

Wolff et al. reported that 75 percent of dental school students cited an interest in treating individuals with developmental disabilities in their practice.⁶ However, Romer et al. reported that a majority of dental schools in the United States and Canada provided less than eight hours of didactic instruction and ten hours or less of clinical practice in the care of persons with developmental disabilities.⁷ A national study of 170 dental hygiene programs reported comparable findings: 8 percent reported they provided ten hours or less of didactic training in the care of individuals with developmental disabilities; 14 percent of the schools had zero to five hours of exposure; and 57 percent reported that no clinic experience was offered.⁸ The U.S. Department of Health and Human Services HRSA report “Dental Care Considerations of Disadvantaged and Special Care Populations” has recommended that dental/dental hygiene students learn to collaborate with physicians, nurses, occupational therapists, and home health aides in the care of persons with developmental disabilities.⁹ Recommendations from the HRSA report were made to encourage dental and dental hygiene education programs to request funding for interprofessional training of nondental health professionals on oral health risk assessment and establishment of a “dental home.” A dental home is a variation on the American Academy of Pediatrics concept of the medical home—an accessible, continuous, comprehensive, family-centered, coordinated, compassionate, and culturally effective clinical environment.³

One approach to improving oral health outcomes for the developmentally disabled is by enhancing student experience through interprofessional clinical encounters at school-based health settings. The interprofessional education model of the Louisiana State University Health Sciences Center (LSUHSC) School of Dentistry was developed to provide a learning experience that crosses the health professions. Of all health care professions outside of dentistry, nursing has been the most willing to recognize the importance of maintaining good oral health and its impact on general health.¹⁰ The goal of our project was to study the integration of oral health assessment with whole health assessment through a collaborative interprofessional educational experience for dental hygiene students working with elementary school nurses in a school-based environment. Other studies have demonstrated that interprofessional education could change a student’s perception of

professional competence and autonomy of other professions and provide a way to identify mutual responsibility among health care professionals.¹¹ Our project demonstrates a model of interprofessional communication between dental hygiene students and school nurses to improve oral health education and intervention for individuals with ND/ID.

Methodology

The first step of this project consisted of collaborating with United Cerebral Palsy (UCP) of Greater New Orleans, a not-for-profit health organization, to identify fifteen inner-city elementary schools with a high percentage of children with ND/ID who needed oral health screenings, education, and referrals. The schools selected had more than 85 percent participation in free and reduced school lunch programs, and almost all of the children with ND/ID were Medicaid-eligible. Most children were not actively receiving dental treatment and did not practice consistent preventive home care. The UCP operated a dental clinic with part-time dentists with expertise in special care dentistry. The dentists agreed to accept patients in need of restorative dental care as part of this project.

The next step was to implement a dental public health curriculum for dental hygiene students and school nurses that would include interprofessional interactions in a real-life public health setting. This curriculum included four phases: 1) community dental public health training; 2) oral health screening and data collection at the fifteen elementary schools; 3) patient education and referral; and 4) program evaluation. Community dental public health training for dental hygiene students and school nurses consisted of a slide presentation on oral diseases and their relationship with health. After completing this training, each dental hygiene student was assigned to a school to assess the children’s oral health through screening and to collaborate with the school nurse to design an oral health plan of referral. School nurses coordinated the scheduling of the dental hygiene student visits and distributed requests for parental permission for their children to receive oral health screenings.

At the first visit, dental hygiene students working in pairs used puppets, oversized toothbrushes, and an educational videotape to demonstrate proper toothbrushing techniques for the ND/ID students and the school nurse. The children were given their own toothbrush, floss, stickers, and educational coloring

books addressing oral hygiene practices and nutrition. Dental hygiene students also performed noninvasive oral health screenings for children who received their parents' consent to participate (active parental permission forms were used). Screening data was collected using the Special Olympics Special Smiles Screening tool, which was developed by the Centers for Disease Control and Prevention (CDC). Clinical screening variables (Table 1) were edentulism, untreated decay, filled and missing teeth, sealant, injury, fluorosis, gingival signs, and treatment urgency. Children with the ability to respond verbally were questioned concerning oral pain and the number of times their teeth were brushed.

On completion of the screenings, the dental hygiene students presented to the school nurse the oral health data for each individual child and also described the oral health status of the population as a whole. The school nurse used this data to inform parents of their children's oral health needs and to initiate a referral to receive treatment. Arrangements were made for treatment at the on-site dental clinic at UCP.

The project was evaluated using 1) student meetings with designated dental hygiene faculty to discuss their experiences; 2) an evaluation tool completed by the dental hygiene student and the school nurse that focused on their perceptions of the interprofessional experience; and 3) assessment of the school health data for children with ND/ID.

Results

Thirty-five dental hygiene students participated in the community public health training. The students collectively screened a total of 255 children with ND/ID at fifteen inner-city elementary schools, which represented a participation rate greater than 50 percent as the majority of the parents provided consent for their children to participate. Forty-three percent of the children surveyed had untreated dental caries, and 17 percent (n=44) had urgent need for dental treatment. Only 14 percent of children with ND/ID had preventive dental sealants. Nurses provided information about treatment referral to the children's parents. Of the 17 percent with urgent care needs, four (10 percent) were compliant with dental care.

Table 2 lists the results of the dental hygiene students' perception of their experience. Overall, the students rated the experience high, with an overall score of 4.25 out of a possible 5. Over 70 percent of the dental hygiene students felt they had impacted the school nurses' knowledge of oral disease and care, and over 92 percent said they understood the importance of working with other professionals to provide comprehensive oral care. Ninety-two percent indicated that they understood the importance of having a referral process to provide access to care to this population. Sixty-six percent of the students said the experience increased their likelihood of participating in future oral health care programs.

Table 1. Elementary school oral health outcomes

	SCH 1	SCH 2	SCH 3	SCH 4	SCH 5	SCH 6	SCH 7	SCH 8	SCH 9	SCH 10	SCH 11	SCH 12	SCH 13	SCH 14	SCH 15	Total Sch 1-15	%
Number screened	20	23	7	18	12	14	14	3	12	22	24	21	16	23	26	255	
Male	16	17	3	15	6	13	11	2	7	13	14	12	13	13	18	173	67
Female	4	6	4	3	6	1	3	1	5	9	10	9	3	10	8	82	32
Brush 1X per day	17	23	7	17	11	11	12	3	7	22	24	20	14	11	26	225	88
Brush 2-6X per week	3	0	0	1	1	3	2	0	1	0	0	1	2	2	0	16	6
Edentulous	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Decay present	1	9	6	7	7	4	11	1	12	8	7	13	6	12	6	110	43
Fillings present	9	11	3	7	4	5	9	2	3	16	8	9	9	5	9	109	42
Teeth missing	1	0	2	2	0	0	0	0	2	0	1	0	1	3	0	12	5
Sealants	0	1	4	3	4	2	2	1	3	3	1	0	3	8	1	36	14
Injuries	0	3	1	1	1	0	0	0	1	0	1	2	1	1	2	14	6
Fluorosis	5	3	5	8	1	1	3	0	1	1	0	1	0	0	0	29	12
Gingival signs	0	0	4	4	5	2	4	1	0	3	0	0		2	0	25	10
Treatment																	
Non-urgent	0	8	1	2	5	5	4	1	4	3	13	0	4	14	6	70	27
Maintain	18	15	6	11	4	9	10	2	6	14	7	13	8	1	20	144	56
Urgent	1	0	0	5	3	0	4	0	2	5	4	8	4	8	0	44	17

Table 2. Students' responses, UCP project

	Not at All	Somewhat	Definitely
I had an impact on the school nurses' overall knowledge of oral disease and preventive care.	14.81%	33.33%	70.37%
It is important to work with other disciplines in order to provide comprehensive oral care for people.		7.41%	92.59%
This experience increased my understanding of how oral health data can be collected and summarized.		14.81%	85.19%
I understand the importance of having a referral process in order to provide access to care for the special needs population		7.41%	92.59%
This experience increased my confidence in communicating with other professionals.		25.93%	74.07%
I functioned as the expert in oral health care instructions during this project.		14.81%	85.19%
I would feel comfortable lecturing to a group of nurses about oral health care.	7.41%	37.04%	55.56%
This activity increased the possibility of me participating in oral health care programs in the future.		33.33%	66.67%

Note: The dental hygiene students rated the overall IPE as 4.25 on a Likert scale of 0 (dissatisfied) to 5 (extremely satisfied).

Table 3. Nurses' responses, UCP project

	Poor	Fair	Good	Very Good	Excellent
Materials			33.33%	16.67%	50.00%
Consent Form			33.33%	33.33%	33.33%
Orientation			8.33%	50.00%	41.67%
First Visit: Education			25.00%	41.67%	33.33%
Second Visit: Screenings			25.00%	33.33%	41.67%
Third Visit: Outcomes			16.67%	50.00%	33.33%
Products				50.00%	50.00%

The responses from the school nurses were also very positive (Table 3). Seventy-five percent of the nurses rated the educational process as very good or excellent, and 83 percent felt that the results from the screenings were presented in a very good or excellent manner. One hundred percent of the nurses felt that the educational oral hygiene products given to the elementary school children were very good or excellent.

Discussion

The March 2003 report of the ADEA President's Commission provided recommendations for improving the oral health status of all Americans, which includes the roles and responsibilities of academic dental institutions to increase the competency of dental and dental hygiene students in the delivery of oral health services for persons with

special needs.¹² The 2004 ADEA House of Delegates adopted a policy for ADEA to work with the ADA Commission on Dental Accreditation (CODA) to adopt or strengthen accreditation standards at all levels of dental education related to competency in treatment of people with special needs.¹³ ADEA policy was further modified in 2005, urging CODA to adopt accreditation standards that include both didactic and clinical instruction in the treatment of people with special needs as appropriate for the type of educational program.¹⁴

In July 2004, CODA adopted revisions to the Accreditation Standards for Dental Education and Dental Hygiene Education programs with an implementation date of January 1, 2006.¹⁵ Standard 2-26 states that graduates must be competent in assessing the treatment needs of patients with special needs. Many dental professionals are not trained to manage complex medical, social, and behavioral problems experienced by many individuals with ND/ID.¹⁶

Interprofessional education (IPE) has the ability to improve health outcomes by engaging all professional capacities for managing complex needs. Implementing IPE as an educational model requires a modification of attitudes, values, and behaviors in both faculty and students. The educator lays the foundation for the development of interprofessional teaching by presenting applied examples and activities that foster a collaborative approach to patient care in the community.¹⁷ Students should have the opportunity to interact with other disciplines in a real-life public health setting as part of their IPE education. Hyde and Miller (Figure 1) have proposed several competencies that students should achieve for effective interprofessional instructive experiences.¹⁷ A key to success is identifying faculty who are committed to the interprofessional concept. These faculty members must be willing and able to accommodate the vastly different program schedules, which is typically a commitment they make in addition to the usual faculty workload. If faculty are engaged and enriched, then the education of students and their service delivery will benefit the community.¹⁷

Real-life community-level education models should be considered to enhance collaborations in health care education. School-based health settings are well suited to focus on prevention and early intervention skills development. Figure 2 suggests experiences that enhance real-life interprofessional

working relationships for dental hygiene faculty and school nurses as part of an education curriculum.¹⁸

A strength of this model is that dental hygiene students help address the oral health needs of an underserved population while experiencing clinical and didactic education in a school-based public health setting. Due to the favorable evaluations of the dental hygiene student interactions with a school nurse, this model may be replicated in a community health-nursing curriculum. This project reinforced our belief that nursing students should learn to conduct oral health assessment as a part of total health assessment.

One weakness of the IPE model is that even with the demonstrated educational benefit to students, few children with special needs requiring urgent dental care actually received clinical treatment. Comprehensive case management and an increase in building proficient clinical skills among dental clinicians are needed to establish a dental home for children with special needs. This experience was exemplary in the collaboration between the disciplines of dental hygiene nursing in treating the “whole” patient; however, considering dental disease patterns, expanding the coordination to include trained social workers or others is advisable.

Since dental hygienists are qualified to develop and implement oral health components of health promotion and education, disease prevention, chronic disease management, and self-care programs in

At the end of the instructional experience, the student will:

- Learn the terminology and glossary of terms associated with interprofessional practice assessment and planning;
- Articulate an understanding of interprofessional teaming;
- Demonstrate an understanding of the unique contribution of interprofessional approaches to assessment, diagnosis, planning, intervention, and evaluation services;
- Demonstrate skill in the interprofessional and disciplinary approaches to assessment, diagnosis, planning, intervention, and evaluation;
- Demonstrate an understanding of the discipline-specific contribution to the interprofessional team;
- Understand the role of other health professions on the interprofessional team;
- Describe the role of the interprofessional team in the provision of services as it relates to assessment, diagnosis, planning, intervention, and evaluation;
- Demonstrate ability to function in an interprofessional mode; and
- Understand benefits to health care providers and to patients' overall well-being.

Source: Hyde R, Miller D. Multidisciplinary approach to home health care: a pilot study. *J Dent Hyg* 1998;73:78-83.

Figure 1. Interprofessional teaming competencies

The following are suggestions for collaboration between dental hygienists and nurses:

1. Identify referral sources for dental treatment in public and private delivery systems (DH and N).
2. Facilitate establishment of referral networks (DH and N).
3. Volunteer as an oral health consultant (DH).
4. Participate in oral health screenings (DH and N).
5. Establish dental hygiene student community services sites at primary care nursing centers (DH and N).
6. Present guest lectures in nursing education programs (DH).
7. Present guest lectures in dental hygiene education programs (N).

DH=dental hygiene faculty

N=nursing faculty

Source: Fellona M, DeVore L. Oral health services in primary care nursing centers: opportunities for dental hygiene and nursing collaboration. *J Dent Hyg* 1999;73:69-76.

Figure 2. Collaboration suggestions

community settings, they can play a very important role as part of an interprofessional health care team in a school health environment.¹⁹ As dental hygiene training programs increase the use of student preparation in alternative practice settings, dental hygiene graduates will become more comfortable in assuming these responsibilities.²⁰ Interprofessional education programs with nursing and dental hygiene can foster collaborative relationships and expand students' educational experiences in nontraditional settings.¹⁹ This integration of basic oral health care services into primary care nursing can provide an effective method of enhancing the overall health status of the population.¹⁷

Conclusion

Opportunities to advance the delivery of unmet clinical services for people with disabilities can be achieved by effectively implementing CODA dental standard 2-26 and dental hygiene standard 2-18. The LSUHSC School of Dentistry interprofessional education model can be used in a community public health setting to address the unmet oral health care needs of children with neurodevelopmental/intellectual disabilities. Dental hygiene students learned through interprofessional education to comprehensively manage the needs of their patients while understanding the school nurse's role and the benefits of collaboration. The school nurse learned to understand

the importance of oral health care and the need to establish a dental home for children.

Based on these results, the LSUHSC School of Dentistry curriculum now requires residents in advanced dentistry (GPR) and dental hygiene students to work together as teams. These dental teams coordinate treatment with the directors of nursing in state developmental centers for people with ND/ID to increase their clinical competency and experience. Hopefully, these IPE collaborations will expand access to oral health care for underserved populations.

Acknowledgments

A special thank you to the faculty in the LSU Department of Dental Hygiene. This project would not have been possible without their effective communication, planning, and support of public health dentistry.

REFERENCES

1. Goodman HS, Manski MC, Williams JN, Manski RJ. An analysis of preventive dental visits by provider type, 1996. *J Am Dent Assoc* 2005;136(2):221-8.
2. Oral health in America: a report of the surgeon general (executive summary). Bethesda, MD: U.S. Department of Health and Human Services, National Institute for Dental and Craniofacial Research, 2000.
3. American Academy of Pediatrics. Policy statement on oral health risk assessment timing and establishment of the dental home. *Pediatrics* 2003;111(5):1113-6.

4. Dental care considerations of disadvantaged and special care populations. Baltimore, MD: U.S. Department of Health and Human Services, Health Resources and Services Administration, April 2001.
5. The health and health care of people with intellectual disabilities: attitude studies. Washington, DC: Special Olympics, 2005. At: www.specialolympics.org. Accessed: December 13, 2005.
6. Wolff AJ, Waldman HB, Milano M, Perlman SP. Dental students' experiences with and attitudes towards people with mental retardation. *J Am Dent Assoc* 2004;135:353-7.
7. Romer M, Dougherty N, Armores-Lafleur E. Predoctoral education in special care dentistry: paving the way for better success. *J Dent Child* 1999;66:132-5.
8. Goodwin M, Hanlon L, Perlman S. Dental hygiene curriculum study on care of developmentally disabled. Boston: Forsyth Dental Center, 1994.
9. Closing the gap: a national blueprint to improve the health of persons with mental retardation. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, 2002.
10. O'Connor C, Carr S. Interdisciplinary collaboration between nursing and dental hygiene: clinical care of the elderly. *J Gerontol Nurs* 1981;7:233-5.
11. Pyle MA. Changing perceptions of oral health and its importance to general health: provider perceptions, policymaker perceptions. *Spec Care Dent* 2002;22:8-15.
12. Haden NK, Catalanotto F, Alexander C, et al. Improving the oral health status of all Americans: roles and responsibilities of academic dental institutions. The report of the ADEA President's Commission. *J Dent Educ* 2003;67(5):1-22.
13. American Dental Education Association. ADEA policy statements as revised and approved by the 2004 House of Delegates. *J Dent Educ* 2004;68(7):734.
14. American Dental Education Association. House of Delegates Resolution 18H-204. Adopted March 7, 2005.
15. Commission on Dental Accreditation. Accreditation standards for dental and dental hygiene education, standard 2-18 (p. 22), standard 2-26 (p. 15). Chicago: American Dental Association, 2005. At: www.ada.org. Accessed: December 14, 2005.
16. Glassman P. New models for improving oral health for people with special needs. *J Calif Dent Assoc* 2005;33(8):625-33.
17. Hyde R, Miller D. Multidisciplinary approach to home health care: a pilot study. *J Dent Hyg* 1998;73:78-83.
18. Fellona M, DeVore L. Oral health services in primary care nursing centers: opportunities for dental hygiene and nursing collaboration. *J Dent Hyg* 1999;73:69-76.
19. Zimmer S, Miller D. Interdisciplinary education in dental hygiene: a pilot project. *Educ Dir Dent Hyg* 1985;10:4-12.
20. Betz C, Raynor O. The use of interdisciplinary teams for clinical instruction. *Nurs Educ* 1998;23:32-7.