Increasing General Dentists’ Provision of Care to Child Patients Through Changes in the Undergraduate Pediatric Dentistry Program


Abstract: Reduced caries rates and an increased percentage of children with dental insurance have made it more difficult for dental schools to provide undergraduates with sufficient numbers of pediatric dental patients requiring restorative procedures. This may result in graduates who are not competent and are reluctant to treat children after graduation. To ensure the quality of the undergraduate clinical training program, the Division of Pediatric Dentistry at the University of Manitoba changed from a comprehensive-based clinic to a block system in 1998-99. Specific communities with limited access to dental care (neighboring core area schools and Hutterite colonies) were specifically targeted as potential sources for child patients. This format increased the exposure of students to patient management as well as to complex pediatric dentistry procedures. To assess the learning experiences before and after the changes to the clinical pediatric dentistry program, sixty general dentists who had graduated from the University of Manitoba were randomly selected using the Manitoba Dental Association Directory. Surveys were sent to twenty general dentists who graduated in each of the following years: 1993, 2000, and 2002. Forty-five dentists responded, fifteen from each of the three surveyed classes. Dentists who graduated after the changes to the program (2000, 2002) reported that they performed a greater number of complex pediatric dentistry procedures and treated more toddler and preschool children than the group that graduated before the changes (1993). Referrals to pediatric dentistry specialists were higher in the 1993 group than in the 2000 and 2002 groups. In conclusion, an adequate pool of pediatric patients is critical to provide dental students with sufficient learning experiences. The dentists who graduated from the program after the changes were implemented are providing more comprehensive treatment to younger children.

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It is essential for undergraduate dental students to receive adequate learning experience in treating children, since the majority of general dentists provide dental treatment for children. However, reduced caries prevalence and an increased percentage of children with dental insurance have made it more difficult for dental schools to provide undergraduate dental students with sufficient numbers of pediatric dental patients requiring restorative procedures during their clinical training. Indeed, if students lack clinical competency at the time of graduation, they may later be reluctant to treat pediatric dentistry patients in their practices, thus increasing the number of referrals to already overutilized specialist pediatric dentistry offices.

The University of Manitoba was facing the same dilemma as many other dental faculties in developed countries. The lack of pediatric patients and the difficulty in their selection have affected the clinical training of undergraduate dental students and the ability to fulfill the guidelines recommended by the American Academy of Pediatric Dentistry and the American Dental Education Association. Notably, prior to 1998, the University of Manitoba’s pediatric dental clinic program was based upon the comprehensive care model. The model was one in which patients applied to the program and, after being accepted, were assigned to a specific dental student who was then responsible for providing complete pediatric restorative care for that patient. Dental students were responsible for contacting the parents, scheduling dental appointments, completing preventive and therapeutic dental treatment, and recalling patients. Although the program functioned well in pre-
vious years, the changing nature of pediatric dentistry, which provided patients with lower caries rates, created several problems with this type of clinical system including assigning students with patients that required little if any complex pediatric dentistry work.

For this reason, in 1998, the Division of Pediatric Dentistry adopted a block style format for its clinical program to improve students’ clinical education and make sure all students received an equivalent experience with child patients. The division assumed the responsibility for patient selection, thus targeting children in specific communities who had limited access to dental care (that is, neighboring core area schools and Hutterite colonies) as potential sources for patients. Restructuring of the pediatric dentistry program provided a new clinical concept in children’s dentistry for the undergraduate students. This concept involved the Division of Pediatric Dentistry assuming responsibility for assigning child patients in need of specific types of care to dental students. Thus, in the new block format, students were assigned procedures that prepared them to take the respective clinical competency exam. Third-year dental students were initially assigned pediatric patients requiring treatment planning procedures and, when ready, each student was assigned to perform this competency. Next, students were assigned patients needing pits and fissure sealants or preventive resin restorations followed by the clinical competency exam. Third-year dental students were initially assigned pediatric patients requiring treatment planning procedures and, when ready, each student was assigned to perform this competency. Next, students were assigned patients needing pits and fissure sealants or preventive resin restorations followed by the clinical competency exam. Following this, third-year students were required to do Class I and Class II conventional restorations on primary teeth and perform the associated competencies, whereas fourth-year students were required to complete stainless steel crowns, endodontic procedures on primary or young permanent teeth, space maintainers, and case presentations and coordinate patient management before taking the respective competency exams associated with these skills. Besides working on the procedures from the block format, students continued to provide care to patients and perform other procedures as required.

The block format, when compared to the previous clinical education system, has increased the exposure of students to the management of oral health problems in children and enhanced our students’ opportunities to perform complex pediatric dentistry procedures. To assess the impact of the new block curriculum, we conducted a study to determine the perceptions of our graduates about their learning experiences and comfort level with caring for child patients before and after changes to the undergraduate pediatric dentistry clinical program.

Materials and Methods

Forty-five general dentists who were graduates from the Faculty of Dentistry, University of Manitoba, participated in a survey to determine perceptions about students’ learning experiences and comfort level with caring for child patients before and after implementation of the new curriculum. Dentists were randomly selected using the Manitoba Dental Association Directory. The participant information and consent forms were sent to twenty practitioners who graduated in each of the following years: 1993, 2000, and 2002, for a total of sixty potential subjects. These graduating classes were chosen to address the learning experiences prior to (1993) and after changes to the program (2000 and 2002). The rationale for selecting the class of 1993 and not a class from 1994-98 was that, during the latter period of time, different outreach programs were part of the undergraduate pediatric dentistry, but provided students with varied amounts of clinical work that were difficult to assess.

We identified sixty graduates from these three classes as the study sample based on the following rationale. Twenty to twenty-five students graduate annually from the faculty. Therefore, the number of dentists that we expected to participate in this study (our response goal was fifteen per class) represented 60 percent of the graduating class in each year. Participation in the survey was anonymous, and the dentists were informed that the results would be used to determine the value of the curriculum changes made and the need for further improvements.

The survey included nine questions prepared in a “menu format” style with additional instructions given to the participants to improve their understanding and to obtain more reliable and comparable information. Notably, respondents were asked to identify the number of children and adult patients they treated per week as well as the number of complex pediatric dentistry procedures they performed per month. Respondents were also asked to provide information about the age group of pediatric patients treated in their offices, as well as the reasons and the number per month of pediatric specialist referrals. Participants were to select the behavioral management techniques used in their offices and the hours
per week of employment and indicate if they were associates or practice owners. Finally, participants were asked to indicate how well the undergraduate pediatric dentistry program had prepared them to provide complex pediatric dental treatment to children of all ages, especially those ≤6 yrs of age (very poorly, poorly, sufficiently, well, very well, and outstandingly, thus corresponding to the 0-5 grading system). Data from the completed questionnaires was collected by an examiner unaware of the identity of the groups and which group the subjects were assigned to and was not involved in the selection process nor in the distribution of information and consent forms to the participants.

The year of graduation and the level of confidence in working with children were analyzed separately, and the mean value for each care provider was calculated. Repeated analysis of variance was used to determine the differences for the questions asked as a function of the year of graduation and the hours of practice/week. Differences were considered significant at p<0.05. Post hoc comparisons were made using Duncan’s multiple range test.

Results

A total of forty-five dentists responded (fifteen from each graduating class 1993, 2000, 2002) to the survey from the mail-out sample of sixty individuals, representing a response rate of 75 percent. In the 2002 group (one year after graduation), all dentists were associates. However, with increasing time following graduation, the percentage of practice ownership increased, and after ten years, more than half of the dentists owned their own practices (Table 1; p<0.001 for year 1 or 3: year 10). The majority of dentists surveyed were full-time employees, and there were no differences between the observed groups (p>0.05).

Dentists who graduated in 2002 reported that they treated a higher percentage of child patients in relation to adult patients than the 1993 and 2000 graduates. However, there was no statistical difference among the three groups (Figure 1; p>0.05).

In the 2000 and 2002 group of dentists (one and three years after graduation), the number of com-

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Figure 1. Patient distribution reported by survey respondents
plex pediatric dentistry procedures performed (stainless steel crowns, endodontic treatment of primary or young permanent teeth, fabrication and delivery of space maintainers, etc.) was greater than in the 1993 graduates (year 10 after graduation; p<0.001; Figure 2). At the same time, referrals to pediatric dentistry specialists were higher in the 1993 group than the practitioners that graduated one and three years previously (p<0.05).

All surveyed dentists provided more complex pediatric dentistry treatments (endodontic procedures on primary or young permanent teeth, stainless steel crowns, space maintainers, etc.) for patients ≥5 yrs of age (Figure 3). However, only 2000 and 2002 graduates provided complex pediatric dentistry treatment to preschool children (three to five years old, 87 percent and 100 percent respectively) and tod-
All surveyed dentists used some form of behavioral modification technique in managing the child patient (Table 2). The most common techniques used by all dentists were non-pharmacological communication techniques. Physical restraints were used by dentists who graduated three and ten years ago, and the most controversial method (i.e., hand over mouth) only by two practitioners who graduated three years ago.

In response to how well the undergraduate pediatric dentistry program had prepared them to provide complex pediatric dental treatment to children ≤6 yrs of age, 2000 and 2002 graduates reported a higher level of preparedness (Figure 4; p<0.01). Respondents rated their level of preparation using this scale that is reflected along the vertical axis of Figure 4: very poorly (0), poorly (1), sufficiently (2), well (3), very well (4), and outstandingly (5).

**Discussion**

During the academic year 1998-99 the Division of Pediatric Dentistry adopted a block curriculum format and assumed full responsibility for patient assignment and student scheduling for the Pediatric Dentistry Clinical Program. Indeed, the division worked hard to attract and recruit children in need of complex care, thus developing new partnerships with several underserved groups. These partnerships are intended to provide much needed dental care to children as well as to enhance the clinical education of the dental students. Consequently, an innovative “in reach” bussing program was developed to transport and provide dental treatment at the faculty to children from ten elementary schools (Shaughnessy Park School, Luxton, Lord Nelson, Faraday, Ralph Brown, Robertson, Lord Selkirk, Weston, Greenway, Inkster) located in the underserved core area of Winnipeg. Similar partnerships were also created with four Hutterite colonies (Maxwell, Lakeside, Homewood,
Glenway), situated in rural Manitoba, to further increase the number of children requiring complex dental care. Both partnerships involved screening at the site (school or colony) followed by the bussing of children that needed restorative dental care, to the faculty clinic.7 Notably, after the changes were implemented, the exposure of undergraduate students to complex pediatric dentistry procedures has quadrupled.7 To assess the impact of these changes upon the practice patterns of general dentists who graduated from our school, forty-five dentists participated in the survey to determine their perceptions of the learning experience and level of preparedness before and after changes to the undergraduate pediatric dentistry clinical program. Collectively, the main findings were that the changes to the program have increased the number of toddler and preschool pediatric dental patients being treated by recent graduates of the dental school and contributed to higher perceptions of preparedness to provide pediatric care among our graduates.

This study demonstrates that practitioners who graduated after the changes to the program provide complex pediatric dentistry care to a greater number of patients and refer fewer patients to pediatric dentistry specialists when compared to the dentists who graduated before the changes. These increased restorative experiences have enabled the Division of Pediatric Dentistry to remove strictly enforced student requirements and to introduce more appropriate clinical competency exams. Requirements remain only as the guideline for the division to ensure that every student will get an equal opportunity for learning. Collectively, this large pool of pediatric restorative patients has given students the ability, contrary to the majority of schools in North America,9 to treat as many complex pediatric patients as needed in order to reach the competency levels. In the undergraduate pediatric dental clinic at the University of Manitoba, students are advised to take the competency examination only after completing a certain number of specific procedures. In total the pediatric dentistry program requires successful completion of nine clinical competencies: 1) dental examination and treatment planning; 2) pit and fissure sealants; 3) Class I restoration (primary dentition); 4) Cavity II restoration (primary dentition); 5) space maintainer; 6) endodontic treatment of primary or young permanent tooth; 7) stainless steel crown restoration; 8) case presentation; and 9) patient management.

All surveyed dentists used nonpharmacological communication techniques; however, only dentists who graduated after the changes to the pediatric dentistry program were comfortable in treating toddlers and preschool children. At the same time, practitioners who graduated before the changes to the program found it difficult to treat toddler and preschool patients that required complex pediatric dental treatment. Similarly, a survey conducted at the dental college in Tokyo, Japan, demonstrated that a younger age, the complexity of the treatment, and dental trauma are the most frequent reasons for the general dentist’s referrals.10 Notably, our and other studies are in agreement that fewer opportunities for educational experiences with young and noncompliant patients may result in general dentists not being adequately trained and thus not feeling comfortable or competent in treating very young patients.5,9 However, future studies should address a number of other factors that could explain the apparent increase in pediatric care by general dentists over a ten-year period including demographic shifts, better parent awareness, more active recruitment and advertisement by dentists, dentists’ postgraduation educational experiences, and fewer pediatric specialists in the region.

In conclusion, an adequate pool of pediatric patients and competence-based learning are critical in exposing dental students to sufficient experiences. The dentists who graduated from the University of Manitoba after changes to the program seem to be better prepared to provide comprehensive treatment to younger children. It is also essential to emphasize the importance of conducting this type of survey for the assessment of different dental programs, as they provide a valuable means of addressing the preparedness of dentists to provide comprehensive care to their patients.

REFERENCES