

1477

DENTAL NURSES IN TRINIDAD AND TOBAGO¹

*Linda P. Steele*²

INTRODUCTION

The Dental Nurses Training Scheme in Trinidad and Tobago, that was modelled on the New Zealand program, began operating in 1976. This program produced the island's first qualified dental nurses in 1978. Eight years later, during the period from December 1986 to February 1987, nearly all the dental nurses employed by the Government Dental Service attended continuing education seminars at a new Dental Nurses Training School in Arima, St. George County, Trinidad. During this time a study was undertaken, the purpose of which was to determine the dental nurses' geographic distribution, allocation of time to different activities, knowledge of basic oral health education messages, and problems encountered in their work.

METHODOLOGY

Sixty-one of the 77 national graduates who had graduated from the training program between 1978 and 1984 were included in the study (Table 1). Of these 61 dental nurses, only five were men. Although there were 66 dental nurses employed by the Government Dental Service at the time of the study, five were unable to attend the continuing education seminars. Information on the distribution of dental nurses throughout the country was obtained from the study participants. Information on the nonparticipants was obtained from the Chief Dental Officer. A questionnaire was used to determine allocation of time to different activities, work patterns, and problems encountered by the dental nurses. A quiz (Annex 1) was used to test their knowledge of basic oral health education messages.

RESULTS

The geographic distribution of dental nurses throughout Trinidad and Tobago is uneven. Table 2 shows that the ratio of dental nurses to children ranged from one per 1,800 children in Tobago to one per 10,900 children in Victoria. Mayaro has no dental nurse, but Mayaro and Nariva are administered jointly with regard to health services, so the one dental nurse in Nariva had responsibility for 11,800 children in the

¹ This article will also be published in Spanish in the *Boletín de la Oficina Sanitaria Panamericana*.

² Dental Consultant, PAHO, 49 Jerningham Avenue, Belmont, Trinidad, West Indies.

TABLE 1. The number of students graduating from the Dental Nurses Training School in 1978-1984.^a

Year	No. of students graduating			
	Study participants	National graduates	Foreign graduates	Total graduates
1978	15	21	10	31
1980	11	13	6	19
1981	17	20	4	24
1983	6	11	8	19
1984	12	12	4	16
Total	61	77	32	109

^a This school closed its doors in 1984.

TABLE 2. Dental nurse to child population ratios by county. Population figures are from the 1981 Census, rounded to the nearest 100 (1).

County	No. of children in thousands			No. of dental nurses	Ratio of dental nurses to:	
	0-4 years	5-14 years	0-14 years		All children	Children 5-14 years
St. George	51.1	93.8	144.9	27	1:5,400	1:3,500
St. David	0.7	1.3	2.0	1	1:2,000	1:1,300
St. Andrew	5.7	11.0	16.7	7	1:2,400	1:1,600
Caroni	17.6	34.0	51.6	10	1:5,200	1:3,400
Victoria	26.4	50.0	76.3	7	1:10,900	1:7,100
St. Patrick	15.0	28.6	43.6	5	1:8,700	1:5,700
Nariva	3.0	5.9	8.9	1	1:8,900	1:5,900
Mayaro	1.1	1.8	2.9	0	—	—
Tobago	4.8	9.7	14.6	8	1:1,800	1:1,200
Total	125.4	236.1	361.5	66	1:5,500	1:3,600

two counties. Table 3 shows the dramatic improvement in the dental operator to population ratio that the dental nurses training scheme has brought about over the last 15 years.

Most of the dental nurses' time (a mean of 6.9 half-day sessions per week) was allocated to treating children in the clinics (Table 4). All but one dental nurse spent between one and four sessions per week providing dental health education in schools (mean, 2.5 sessions). Other dental health education activities and clerical work took up the remaining time (mean, 0.7 sessions).

The dental nurses reported treating between four and 20 patients per day, the mean number treated per day being 12. Forty of the dental nurses (66%) reported that they had a dental assistant to work with them all of the time, while eight (13%) worked with a dental assistant part of the time.

TABLE 3. Dental operator to population ratios, 1972-1987.

	1972	1987
Population	1,000,000	1,200,000
Total number of dentists	55 ^a	91
Number of government dental officers	16	15
Number of dental nurses	—	66
Total number of dental operators (dentists plus dental nurses)	55	157
Total number of government dental operators (dental officers plus dental nurses)	16	81
Dental operator: population ratio	1:18,000	1:7,600
Government dental operator: population ratio	1:62,500	1:14,800

^a It is difficult to obtain accurate figures for the number of dentists in Trinidad and Tobago before 1980, when the Dental Profession Act came into force and a dental register was started. The number used here is taken from Atwell (2)

TABLE 4. Distribution of dental nurses according to half-day sessions spent on clinical, dental health education (DHE), and clerical activities.

No. of sessions	Distribution of dental nurses according to number of half-day sessions spent on different activities		
	Clinical work	DHE in schools	DHE in prenatal and child welfare clinics or clerical work
0	—	—	33
1	—	10	15
2	—	21	13
3	1	28	—
4	—	2	—
5	4	—	—
6	10	—	—
7	35	1	—
8	9	—	—
9	2	—	—
Mean	6.9	2.5	0.7

Most of the dental nurses (53, or 87%) worked at a clinic where there was a dentist. However, none of the clinics had a full-time dentist, the number of half-day sessions that the dentist was present ranging from fewer than one a week to five per week (Table 5). Many of

the health clinics have only one dental surgery, so the dental nurse and dentist are unable to run a clinic at the same time. Of those 53 dental nurses who had a dentist at their clinic, 39 (73%) spent no sessions per week, eight (16%) spent one session per week, and six (11%) spent two sessions per week working at the same time as the dentist.

All of the dental nurses felt that they had an effect on the oral health of children in the country. The four ef-

TABLE 5. Distribution of dental nurses according to the number of sessions worked when a dentist was present at the clinic.

Number of sessions worked when a dentist was present at the clinic	Distribution of dental nurses	
	No.	%
Never	8	13
Less than one a week	3	5
1, 2, or 3 sessions per week	44	72
4 or 5 sessions per week	6	10
Total	61	100

facts cited most often were increased awareness of oral health, increased acceptance of dental treatment without fear by children, improved oral hygiene of children, and assignment of greater value to oral health by the public.

A wide range of problems were mentioned by the dental nurses. Those most frequently cited were inadequate facilities, equipment, supplies, and maintenance. The 10 problems and recommended changes most frequently cited are listed in Table 6.

The results of the quiz (Table 7) show that there was fairly wide variation of opinion among the dental nurses about basic oral health messages. The four questions that could be answered true or false were included to stimulate discussion during the seminars on the role of toothbrushing *per se* and the role of fluoride toothpaste in preventing decay. Nearly all of the dental nurses (95% and 97%, respectively) knew of the harmful effects of sugar-containing drinks and consumption of sweets between meals. The most commonly held misconception was that eating fruit helps to clean your teeth. Only 11% knew this to be false.

TABLE 6. The 10 problems and desired changes most frequently cited by the survey respondents.

- 1 Problems relating to inadequate facilities, equipment, supplies, and maintenance.
- 2 Problems with transportation to dental health education visits.
- 3 Problems with other members of the staff (particularly the dentist and dental assistant).
- 4 More dental health education and preventive work should be done.
- 5 Difficulties in getting children to come to the clinic (attendance, time-keeping, and transportation problems).
- 6 More in-service training is needed.
- 7 Dental nurses should be based in the schools.
- 8 The range of work of dental nurses should be extended to include older children and a wider range of clinical techniques.
- 9 Administrative changes are needed.
- 10 Dental nurses should have more status, be more professional, and have a career structure.

TABLE 7. Quiz questions, answers, and results.

Questions and answers	% giving correct response
1 Eating fruit helps to clean your teeth (false)	11
2 Rinsing your mouth after eating sweets helps to prevent decay (false)	46
3 Toothbrushing helps to prevent decay on the smooth surfaces of the teeth	a
4 Toothbrushing helps to prevent decay in the pits and fissures of the teeth	a
5 Toothbrushing helps to prevent decay between the teeth	a
6 Brushing your teeth helps to prevent gum disease (true)	85
7 It is better to brush your teeth before a meal rather than after	a
8 You can get decay from a meal which does not contain any foods with sugar in them (false)	56
9 It is better for children to have sweets at mealtimes rather than between meals (true)	97
10 Honey is less decay-producing than white sugar (false)	62
11 Brown sugar is less decay-producing than white sugar (false)	74
12 Drinks containing sugar (e.g., Coke) are harmful to teeth (true)	95
13 Sugar control is more important for preventing decay than any other measure (true)	69
14 Dental decay increases during pregnancy (false)	66
15 Teeth decay less as you get older (true)	49

^aThese questions can be answered either true or false.

DISCUSSION AND CONCLUSIONS

This study has shown that the distribution of dental nurses throughout the country is uneven, both geographically and in relation to the child population. Redistribution of the dental nurses would not solve the problem, because there are too few of them. More dental nurses need to be trained. As there are over 360,000 children, it would be necessary to have 120 dental nurses to give a dental nurse to child ratio of 1 to 3,000. This is nearly twice as many dental nurses as are presently employed. One dental

nurse to 3,000 children would be an acceptable ratio, but it is much higher than in New Zealand, where one dental nurse is responsible for 500 schoolchildren in a nonfluoridated area or 900 schoolchildren in a fluoridated area.

The child population figures (see Table 2) can only be used as a guide, for the following reasons. The figures quoted relate to children from birth to 14 years of age. Dental nurses treat children only up to the age of 12, but as the population census groups children into age groups 0-4, 5-9, and 10-14, accurate figures for the number of children below the age of 12 are not available. Also, these figures are from the census of 1981, and the population has increased slightly since then. In calculating dental nurse to child population ratios, children 0-4 years of age have been included. Although dental nurses under the 1980 Dental Profession Act can provide dental

care for preschool children, in practice they tend to confine their clinical activities to schoolchildren. Nevertheless, particularly with regard to oral health education, preschool children should be considered.

One very encouraging finding was that of all the dental nurses who have been trained, very few have been lost from the Government Dental Service. It could be predicted that if more dental nurses are trained, there would be a similar low natural wastage rate. However, further training of dental nurses must be considered in the light of facilities available for them when they qualify. If all of the dental nurses needed were to be trained, many new dental surgeries would need to be built, and it may not be feasible to allocate funds for this purpose, when other priorities for spending in the field of health care are considered.

The dental nurses were found to spend about three-tenths of their time performing health education activities. This is an encouraging finding, indicating that oral health education is rightly regarded as important. However, there seems to be a basis for inconsistency and confusion in the messages they are giving to children and pregnant women. The continuing education seminars that these dental nurses attended appeared to be useful, but in order to ensure that they give the correct oral health messages, present them effectively, and keep up with new developments, further courses are strongly recommended.

There is wide variation in the average number of patients seen by the dental nurses per day. Perhaps efficiency could be improved if those dental nurses who seldom or never work with a dental assistant could have an assistant working with them all the time.

It is apparent from this study that the dental nurses are working alone most of the time. According to the 1980

Dental Profession Act, "A dental nurse is qualified to treat children only and such treatment shall be carried out in facilities or services operated or conducted by government or under the direct or indirect supervision of a dentist in private clinics." This seems to infer that they must be supervised in private clinics, but not necessarily in government clinics. Although it is not illegal for them to work alone, a teamwork approach could lead to improvements in the service. The original scheme made provision for some dental nurses to be appointed as supervisors. None have been appointed, so the only people who could help to supervise dental nurses are the government dental officers. Both dental officers and dental nurses could benefit from working more together.

Although all the dental nurses thought that they had had an effect on the oral health of the children in the country, in the absence of data from epidemiologic studies this cannot be evaluated objectively.

The problem of inadequate equipment and supplies must be carefully investigated to see how the situation could be improved, as this can affect the dental nurses' efficiency. It might help if they were given training on how to do simple maintenance and repairs themselves.

Despite all the problems, it is clear that the dental nurse program has made a worthwhile improvement in terms of the human resources available for providing dental care to the child population of Trinidad and Tobago.

SUMMARY

The dental nurse training program in Trinidad and Tobago has made a substantial improvement in the dental operator to population ratio in the islands over the last 10 years. Nevertheless, the 66 dental nurses employed by the Government Dental Service are too few, and are unevenly distributed both geographically and in relation to the child population. Further training of dental nurses, to expand the workforce, must be considered, taking into account the priorities for spending in the health care sector.

The dental nurses play an important role in providing oral health education to children and pregnant women. An ongoing program of continuing education would help to ensure that their knowledge and skills are kept up to date.

Some of the dental nurses encounter problems in their work which, if solved, could improve their efficiency and job satisfaction. These problems include maintenance and supply of equipment and materials. There is also scope for the dental nurse, dentist, and dental assistant to improve their teamwork.

There is no doubt that the dental nurses training program has had a big impact on oral health services in Trinidad and Tobago, and expansion of this program is to be recommended.

REFERENCES

- 1 Republic of Trinidad and Tobago, Central Statistical Office. *Annual Statistical Digest*, vol. 29, 1982.
- 2 Atwell, R. V. M. A Plan to Develop the Dental Services of Trinidad and Tobago. Master of Science Thesis, University of Toronto, 1972.
- 3 Besford, J. *Good Mouthkeeping (second ed.)*. Oxford University Press, Oxford, 1984, pp. 51, 53, 88-89, 118, 144-147, and 152.
- 4 Health Education Council, England. *The Scientific Basis of Dental Health Education*. London, 1985, pp. 8-11.
- 5 Sutcliffe, P. Oral Cleanliness and Dental Caries. In: J. J. Murray. *The Prevention of Dental Disease*. Oxford University Press, Oxford, 1983, pp. 159-174.
- 6 World Health Organization. *Epidemiology, Etiology, and Prevention of Periodontal Disease*. WHO Technical Report Series, No. 621. Geneva, 1978, p. 13.
- 7 Silverstone, L. *Preventive Dentistry*. London, Update Books, 1978, pp. 53-54.
- 8 Rugg-Gunn, A. J. Diet and Dental Caries. In: J. J. Murray. *The Prevention of Dental Disease*. Oxford University Press, Oxford, 1983, pp. 3-82.

ANNEX 1. Answers and Scientific Basis for the Quiz.

Question 1: Eating fruit helps to clean your teeth. False.

It is now generally accepted that methods for removing plaque such as eating fibrous foods including apples and carrots are ineffective. Fibrous foods do not reach the recessed areas of the tooth surface and can never be a substitute for brushing and flossing. (3, 4)

Question 2: Rinsing your mouth after eating sweets helps to prevent decay. False.

Rinsing your mouth with water may remove some food particles, but will not remove plaque, or the sugar or acid in the plaque. The carious process will continue undisturbed. Even the effectiveness of an antiseptic mouthwash for caries control has not been established. (4)

Questions 3, 4, and 5: Toothbrushing helps to prevent decay on the smooth surfaces of the teeth, in the pits and fissures, and between the teeth. True or false.

The relationship between oral cleanliness and decay experience is a controversial issue. Sutcliffe (5) reviews the evidence from many studies and concludes that there is no unequivocal evidence that good oral cleanliness reduces caries experience, nor is there sufficient evidence to condemn the value of good oral cleanliness as a caries preventive. However, certain facts about toothbrushing and caries are certain. In order for caries to occur, three factors must be present together: plaque, sugar and a susceptible tooth. Susceptible populations with heavy plaque deposits can remain relatively free from dental caries as long as only small amounts of sugar are eaten. Conversely, even with good oral hygiene, toothbrushing inevitably leaves some plaque in fissures and between the teeth, which are prime sites for caries to occur. Therefore individuals who consume a high-sucrose diet will experience decay irrespective of how good or bad their oral hygiene is. From this, the following can be concluded with reasonable certainty: Brushing with a *non-fluoride* toothpaste will *not* help to prevent decay, except perhaps on the smooth surfaces of the teeth where the plaque is easily accessible. Brushing with a *fluoride* toothpaste *will* help to prevent decay, but this effect is attributable to the fluoride in the toothpaste and not to the brushing alone. In view of the controversial nature of these questions, both true and false answers were accepted as correct.

Question 6: Brushing your teeth helps to prevent gum disease. True.

Dental plaque is the prime cause of gingivitis and periodontitis, and there is ample evidence to show that effective removal of plaque by toothbrushing and other means prevents or causes resolution of gum disease. (6)

Question 7: It is better to brush your teeth before a meal rather than after. True or false.

This is another controversial question. Many dentists now believe that it is better to remove as much plaque as possible *before* a meal so that any sugar in the food will remain as sugar, because there are no bacteria on the tooth surface to turn it into acid (3). This may be true for the smooth surfaces of the teeth, where the plaque can be adequately removed, but it will make no difference to the pits and fissures and between the teeth, where the plaque is largely inaccessible to the toothbrush. On the other hand, brushing *after* a meal with a *fluoride* toothpaste may help. If *demineralization* has occurred, the fluoride in the toothpaste may swing the balance in favor of *remineralization*. (7)

Question 8: You can get decay from a meal which does not contain any foods with sugar in them. False.

Sugar, particularly sucrose, would appear to be the most important dietary item in caries etiology, and its presence around plaque-covered tooth surfaces is essential for more than very limited caries development. Although cooked starch *can* cause some caries, its cariogenicity has been shown to be low, and human epidemiologic studies have frequently recorded low caries experience in people eating high-starch, low-sugar diets. (8)

Question 9: It is better for children to have sweets at mealtimes, rather than between meals. True.

With regard to caries experience, the frequency of sugar intake has been shown to be a more important variable than the total quantity of sugar eaten (8). If sweets *are* eaten, then it is better to restrict their consumption to specific times, such as mealtimes.

Question 10: Honey is less decay-producing than white sugar. False.

Honey is a very concentrated sugar solution. Sugar and water make up 99.4% of honey. If there is any difference, it is very slight. (3)

Question 11: Brown sugar is less decay-producing than white sugar. False.

All variants of white and brown sugar are almost 100% sucrose, and are equally cariogenic. (3)

Question 12: Drinks containing sugar (e.g., Coke) are harmful to teeth. True.

Sugar causes decay, and it makes little difference what it is in. Cola drinks have a high concentration of sugar; Coca-Cola has six-and-a-half teaspoons of sugar in one can. (3)

Question 13: Sugar control is more important for preventing decay than any other measure. True.

Sugar alone causes decay, and eliminating sugar from the diet eliminates decay. Fluoride helps to strengthen teeth, but on its own is not a complete protection (3). The role of oral hygiene has already been discussed.

Question 14: Dental decay increases during pregnancy. False.

Contrary to popular belief, there is no evidence that pregnancy has any effect on the rate of decay. Neither malnutrition in the mother during pregnancy, nor in the child after birth, increases susceptibility. Calcium cannot be removed from a mother's teeth during pregnancy. (4)

Question 15: Teeth decay less as you get older. True.

Teeth do decay less as you get older because, with time, fluoride builds up in the tooth surface and makes it less soluble. Also, many of the prime sites for attack may have already been filled. (3)

New Publication on Caribbean Medical Literature

A comprehensive index to the health-related literature of and on the Caribbean area has been published by the University of the West Indies (UWI). *Medical Caribbeana*, compiled by Laxmi Mansingh, Librarian-in-Charge at the UWI Medical Library, contains entries on more than 700 monographs and articles gleaned from some 1,100 regional and international journals and dating back to 1679. The literature is indexed under title, names of all authors, and subject, with 1,800 subject cross-references.

This volume can be ordered from The Library, UWI, Mona, Kingston, Jamaica. The price is J\$430 in the Caribbean area, £53.25 in the UK, and US\$106.50 in the USA, Canada, and the rest of the world (add 15% for postage/handling). Make checks payable to The Library, UWI.