

THE TRAINING OF DENTAL THERAPISTS IN N. S. W.

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豪洲“뉴—사우스웨일즈州”에 있어서 齒科補助員(治療士)教育

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김 영 해

.....>국문초록<.....

成長期에 있어서 齒牙齶蝕病發生은 特히 國民學校兒童에게서 크게 나타나며 손쉬운 對策으로 發展된 것이 齒科治療士(dental therapist)或은 齒科看護員(dental nurse)制度이다. 이 制度는 約 50年前 Newzealand에서 始作되어 國民學校兒童에 對한 簡單한 治療와 口腔衛生教育及豫防에 對한 指導를 主任務로 삼고 各學校에 配置되었다.

最近 이 制度는 大洋洲各國에 導入되어 類似業務에 臨하고 있다.

韓國에는 各種補助員學校가 있으나 이 制度와는 業務分野가 다르고 國民學校兒童에 對한 專擔制度가 確立되어 있지 않기에 “뉴—사우스웨일즈州”에 있는 學校를 例로 들어 學校의 行政的構造, 人力, 敎課內容 訓練方法, 實社會活動, 及 本人들의 職業的 滿足度 등을 調查研究하였음.

A. INTRODUCTION

The first auxiliary developed in dentistry was the dental technician upon whose mastery of laboratory processes and techniques dentistry is dependent.

The next developed was the dental nurse in New Zealand whose work is performed directly on the patient. These dental nurses were first produced more than 50 years ago and now care for all preschool infants and primary school children in New Zealand. Their service in that country influenced Malaysia, then Australian States to set up similar schemes. Other countries, Fiji, Micronesia, Canada and England established similar services.

The other type of auxiliary is the dental hygienist (or assistant) who works mostly on dental prophylaxis-surface treatment. Hygienist courses or schools are established in the United States of America, England, Japan and Korea. The difference between hygienists and therapists is reflected in the work field that they are concerned with. The former has a more limited field of work than the therapist. In Australia, Tasmania established the first training school for dental

therapists in 1968. Western Australia in 1974, New South Wales in 1975, and Victoria in 1976 followed.

The School of Dental Therapy, Westmead, was chosen as a model for the purpose of this study.

School of Dental Therapy, Westmead, New South Wales

1. Organization of the school

The school is under the auspices of the Health Commission of New South Wales, is authorized to employ teaching staff (4 dentists, 3 dental therapists) and 10 supportive officials (2 secretaries, 1 clerk, 3 reception staff, 2 equipment maintenance staff, and 2 laborers). Dentists are responsible for teaching basic dental science and clinical training, and the therapist staff are responsible for clinical training.

2. Entry qualifications

Female graduates of high schools are qualified to apply. Some students with school certificate and more than 2 years of experience in dental assistance services are also qualified to apply.

3. Objective of the school

"To train therapists for the Health Commission under the provision of the Dentists' Act who are capable clinicians in what they do, capable judges of what they should refer to a dental officer and not attempt themselves, and who are dedicated to the ideal of Dental Health, giving a major part of their attention to the people whose health they are working to promote" (1976 Curriculum statement)

Responsibilities of the dental therapist are:

- 3.1 To provide early treatment for primary school children by means of filling and extraction.
- 3.2 To provide preventive measures against dental caries and gingival disease.
- 3.3 To advise or give information on oral health.

4. Resources

- 4.1 Slide and overhead projectors in classroom.
- 4.2 30 laboratory places with mannequin and high-speed dental engine.
- 4.3 32 dental chairs and unite with high-speed dental engine.
- 4.4 Dental x-ray and viewer.

5. Outline of the course

- 5.1 Training in the basic biological sciences begins in the first semester with a revision of those parts of physics and chemistry which the students will need to understand for their later work.

The study of cellular structure, function and the cellular process of inflammation are followed by general anatomy and pathology of the various body systems. The detailed micro-

structure of teeth also occupies a central place in the first semester curriculum.

- 5.2 In the second semester, detailed anatomy of the dental region, general pathology and dental pathology are taught.
- 5.3 Health begins with the study of hygiene and with dental health education, which continues through both semesters. Nutrition, the action of fluorides and a first-aid course are all in the first semester.
- 5.4 Personal relationship begins with participatory exercise, and concludes in the second semester with a study of the processes of group communication and child development.
- 5.5 Clinical dental therapy begins with surgery routine, including paper work, and chairside assisting. Tooth anatomy is also given at the beginning of practical work in restorative dental therapy.
- 5.6 The second semester contains large amounts of practical work in the restoration of model teeth and instruction in the clinical subjects of radiology, local anaesthesia, preventive dental therapy and extractions.
- 5.7 Before commencing the treatment of patients, lectures in law and ethics for the dental therapist will make clear to the student her legal and ethical responsibilities in the clinic.
- 5.8 Treatment planning is taught as a clinical subject in the second year, which consists of practical clinical work and dental health education at nearby schools.

6. Curriculum

Curriculum is designed to produce dental therapists who are responsible for giving early dental treatment to primary school children. Their professional field is so strictly limited that the curriculum accordingly narrowed only to achieve responsibilities. Major portions of the curriculum consists of biological science which includes anatomy, physiology and pathology, dental health education which includes preventive dentistry, and restorative dentistry which includes clinical assistance.

Twenty-three subjects are taught in a two year course as shown in Annex 2.

- 6.1 Contents of each subject selected are precise and rather more practical than theoretical, compared with those of dental colleges. It is not difficult to find that the content is always related directly to practical work. The actual number of hours in each subjects are given in Annex 1-1, 1-2.
- 6.2 The category of each subject is also limited in the narrow field of the dental profession, however their professional target is only a child under about 13 years of age. It is unnecessary, for example, to teach inlay and crown for the reason that deciduous teeth will be succeeded in a few years. The major professional responsibility is to provide dental treatment on early stage of dental caries which does not relate to pulp vitality. The case in which pulp vitality is affected by infection or any other causatives, is to be referred to the dentist.
- 6.3 Sequence of the subjects in the curriculum is well organized for step by step learning. Basic knowledge, concepts and theories are given by laboratory training which continues by the end of the second session. The third and the fourth session is only for clinical work.
- 6.4 Teaching methods in the school are lecture in normal class setting, practical exercise in laboratory setting with simulation of mannequin and tutorial discussion in clinical work with

real patients.

- 6.4.1 Lecture: Formal teaching in classroom setting gives cognitive area of each subject with handouts or textbook. Main teaching aids are slides and overhead projectors.
- 6.4.2 Laboratory: Demonstration or illustration is presented prior to students exercise on their model. Students are able to reach a certain level of competency. Components of the work comprise wax carving of 5 primary lower and upper teeth (left or right side), plaster carving of 10 teeth, 5 plastic fillings in different type of cavities on anteriors, and about 10 amalgam fillings on posteriors.
- 6.4.3 Clinic: Clinical work is performed under supervision of staff. Every step is checked by the staff and discussed on an individual level. Practice on actual cases plays an important part in the learning experience for the student.
History taking, oral examination and x-ray taking is routinely done by the student to reach correct diagnosis. Once diagnosis is made then treatment plan will be suggested by a staff. Students practice is performed under the guideline of the plan.

7. Evaluation

Students' competency is assessed during each session and at the end of the session when a subject is completed or a part of content is completed. Black dots on Annex 1-1 and 1-2 indicate intermediate examination, and E indicates final examination at the end of the session. Written examinations are given to assess students' competency in cognitive and affective knowledge on which professional skill is developed.

The examination is carried out by means of multiple choice, true false form, short answer essay and so on.

Professional skill is checked during the session step by step in their performance and students' laboratory products are evaluated.

Laboratory products are:

- 1) Sketch of 10 deciduous teeth in various side view.
 - 2) Wax carving of 10 deciduous teeth and the 1st permanent molar of upper and lower.
 - 3) Cavity preparation on plaster model tooth.
 - 4) Cavity preparation on plastic tooth mounted to mannequin is exercised, and plastic and amalgam filling is completed.
 - 5) Amalgam filling on 10 teeth (4 deciduous, 4 permanent pre-molars and 2 permanent molars).
- Clinical evaluation is made on each student's professional skill mainly in the region of restorative dentistry.

B. PROFESSIONAL ACTIVITIES OF THE DENTALTHERAPIST IN NEW SOUTH WALES

INTRODUCTION

This study is to investigate professional activity of the dental therapist in the metropolitan area of Sydney. The dental therapist is an operative auxiliary trained to perform a limited range

of restorative and preventive procedures for children under the direction of a registered dentist. She performs complete units of restorative and surgical treatment and has a major role in the direct provision of care.

The therapist is appointed to dental clinic attached to a primary school, in the grounds. The school based dental clinic is well equipped to a standard pattern.

The professional roles of the therapists are, in the first instance, the control of existing dental disease by treatment, the prevention of disease by fluoride therapy and by the education of children towards patterns of behaviour that are favourable to good dental health. Children are accessible on a daily basis if necessary and the therapist is able to form a close association with her patients outside the treatment situation. This personal relationship is often a most important motivating force in the establishment of good dental habits.

It will be great benefit to provide information to Korea about the dental therapists's contribution to the dental field in Australia. In Korea to meet national needs the therapist system is more desirable rather than establishment of new dental colleges.

METHOD

To analyse professional activities in accordance with the professional goals of the therapist, questionnaires were distributed to 50 therapists at different school clinics and 21 answer sheets were collected. The questionnaire has been developed based on following areas which are closely related to their responsibilities.

- 1) Curative treatment
- 2) Preventive activity and Oral health education
- 3) Job situation

Curative treatment will be filling and extraction.

Preventive activity for the children is concerned with the tooth brushing instruction and application of fluoride.

Oral health education in early stage of life is an important factor to change children's behaviour to maintain oral hygiene.

Job situation is to explore the professional difficulty the therapist encounters and what area they want to learn more in to meet clinical need.

RESULTS

1.1 Work experience after graduation	
No. of years	Number of respondents
above 10 years	4
1 to 5	11
under 1	6

(table 1)

1.2 Period of present assignment	
No of years	Number of respondents
2 to 5 years	4
1 to 1 yr. 11 mos.	8

under 1 year 9

(table 2)

1.3 Allocation of work time		
Clinical work	health education	number of respondents
90% or more	10% or less	15
79% to 90%	10% to 30%	6

(table 3)

2.1 Number of patients per day	
Number of patients	Number of respondents

9 to 14	16
15 to 20	4
above 20	1

(table 4)

2.2 Number of examinations per day

Number of patients	Number of respondents
1 to 3	8
4 to 7	9
8 to 10	4

(table 5)

2.3 Number of x-ray taken per day

Number of x-rays	Number of x-ray respondents
1 or less	8
2 to 4	6
no response*	7

(table 6) *x-ray is more equipped

2.4 Amalgam filling case per day

Number of fillings	Number of respondents
less than 5	2
6 to 10	15
11 to 15	3
more than 16	1

(table 7)

2.5 Composite filling case per day

Number of cases	Number of respondents
1 or less	11
2 or more	2
no response	8

(table 8)

2.6 Extraction cases per day

Number of cases	Number of respondents
1 to 3	14
4 to 6	2
7 or more	2
no response	3

(table 9)

2.7 Application of topical fluoride per day

Number of cases	Number of respondents
1 to 3	9
4 to 6	5
7 or more	2

no response 5

(table 10)

2.8 Tooth brushing instructions per day

Number of tooth brushing instructions	Number of respondents
1 to 3	8
4 to 6	8
7 or more	4
no response	1

(table 11)

3.1 Health education was held at classroom

Health education	Number of respondents
5%	3
30 to 40%	3
none	

(table 12)

*Total health education hours....100%

3.2 Health education was held at small group

Health education	Number of respondents
10 to 20%	9
above 25%	1
none	11

(table 13)

3.3 Health education on individual basis

Health education	Number of respondents
0 to 20%	3
25 to 50%	3
55 to 85%	4
90% or more	9
no response	2

(table 14)

3.4 Frequency of health education on same class per year

Number of classes/year	Number of respondents
1 to 2	3
3 to 4	6
no response	12

(table 15)

4.1 Dental examinations

Duration of examination	Number of respondents
every 6 months.	17

every 9 months	1
every 12months	1
no response	2

(table 16)

4.2 Return for treatment

Number of respondents	Number of patients
50 to 60%	2
70 to 85	6
90 or more	6
no response	7

(table 17)

*Total patients100%

4.3 Fail to return for treatment

Number of patients	Number of respondents
10% or less	6
15 to 20	3
25% or more	7
no response	5

(table 18)

5.1 Are the patients allowed to leave class for treatment?

allowed?	Number of respondents
yes	18
no	0
no response	3

(table 19)

5.2 Number of pupils to look after

Number of pupils	Number of respondents
500 or less	3
up to 600	3
600 or more	12
no response	3

(table 20)

5.3 Patients from nearby schools

accepted?	number of respondents
yes	13
no response	8

(table 21)

6.1 Any problem with teachers?

any problem?	number of respondents
no	21

(table 22)

6.2 Patient's complain experienced

Patient complained?	number of respondents
yes*	3
no	18

(table 23)

*two lip-bite during anesthesia one haemorrhage after extraction

6.3 Are the cases beyond responsibility referred?

Patients referred?	number of respondents
yes	21
no	0

(table 24)

6.4 Work satisfaction

Satisfied?	number of respondents
yes	14
relatively yes	2
no	5

(table 25)

6.5 Additional training wanted

wanted?	number of respondents
yes	11
no	6
no response	4

(table 26)

6.6 Specification of additional training wanted

subject wanted	number of respondents
suture in case of hemorrhage	7
orthodontics	6
reinforced amalgam filling	4
root canal treatment	3
crown work	3

(table 27)

6.7 Space-maintainer

wanted?	number of respondents
yes	14
no	4
no response	3

(table 28)

SUMMARY OF RESULTS

Answer sheets from 21 therapists were collected and analyzed in various aspect of their professional activities. The majority of them are enjoying their job and there has been no problem in terms of clinical difficulty or interpersonal conflict in their working environment. Following were the main points of this study:

1. Curative treatment

The number of cases a therapist performed per day was relatively higher than that in New Zealand

1.1 Amalgam filling

Two therapists had less than 5 cases/day
Fifteen therapists had 6 to 10 cases/day
Three therapists had 11 to 15 cases/day
One therapist had 16 cases/day

1.2 Composite filling

Eleven therapists had 1 or less/day
Two therapists had 2 or more/day
Eight gave no answer

1.3 Extraction

Fourteen therapists had 1 to 3 cases/day
Two therapists had 4 to 6 cases/day
Two therapists had 7 or more cases/day
Three gave no answer

2. Preventive activity

2.1 Application of fluoride

Nine therapists had 1 to 3 cases/day
Five therapists had 4 to 6 cases/day
Two therapists had 7 or more cases/day

2.2 Tooth brushing instruction

Eight therapists have 1 to 3 pupil/day
Eight therapists gave 4 to 6 pupil/day
Four therapists gave 7 or more pupil/day

3. Oral health education

Oral health education is generally given on individual basis.

Nine therapists answered that more than 90% of the education hours spent on individual basis.

The education at a classroom and in a small group was rarely performed.

4. Eleven respondents wanted additional training in relation with their work. Some pointed out 2 or more subjects.

Seven therapists interested in Suture in case of hemorrhage

Six therapists interested in Orthodontics

Four therapists interested in Reinforced amalgam filling

Three therapists interested in Root canal treatment

Three therapists interested in Crown work

Fourteen therapists interested in Space-maintainer construction

DISCUSSION

1. Curative treatment

The number of cases the therapist gave to patients per day was higher than what the author expected.

Leslie (Director, Division of Dental Health, Wellington, N.Z.) reported that in 1970 every dental nurse inserted about 8 amalgam and resin-fillings, and extracted one case per day. (Australian Dental Journal Vol 16 No.4 p.207). The dental therapist in N.S.W. attended more cases than that of the dental nurse in N.Z.

It is possible that the therapist could have achieved such a large number of cases because the more complex and difficult cases are being referred to dentists. In other words the therapist only takes simple and easy cases. (tables 7, 8 9)

Even though the quality of these treatments can't be evaluated the quantity is highly impressive. It indicates that with appropriate supervision therapists can economise dental treatment of simple cases.

2. Oral health education and preventive activity.

Both oral health education and preventive activity are a major part of the therapist's duties. A minimum number of activities are required periodically, varying from chairside instruction to classroom lessons and talk at parent's and teacher's meeting. The therapist should be a member of the school staff as a teacher and the dental clinic should be as familiar to the children as the classroom. Clinic should be as familiar to the children as the classroom.

The vast majority of children are resigned to their periodic visits to the clinic because of unpleasant dental experience in the past.

Oral health education was conducted mainly on an individual basis and classroom lesson was given in a few occasions. (tables 11, 12, 13, 14, 15).

It is desirable that the curriculum at primary schools should contain oral health education to provide periodical classroom lessons on oral hygiene--tooth brushing instruction, significant role of sweets to decay, importance of fluoride dentifrice, periodic check at a dental clinic and so on. By doing this the children may learn to accept the therapist or the dentist and a favorable behavioral change towards dentistry could be expected.

The fact that dental therapists in N.S.W. do not seem to be sufficiently involved in education and prevention might indicate a need for greater emphasis on these areas in the training of dental therapists.

3. Job situation

More than half of the therapists are satisfied with their profession but they wanted additional training in various topics. Suturing technique can be taught without any difficulty in the school of dental therapy. Another subject they wanted to learn was space-maintainer construction which is an important one to be considered as a part of curriculum of the school.

If a deciduous tooth was missing in earlier stage of life, the space may close, which might result in discrepancy of secondary dentition. The rest of the subject postulated are difficult to take into consideration as a part of the curriculum because these subjects need sophisticated academic background and longer period of teaching. (tables 25, 26, 27, 28)

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Annex 1—f

[1st Year]

1st Semester

2nd Semester

Date	1st Semester				2nd Semester				
	March	April	May	June	July	August	Sept	Octob	Nov
Subjects	1 7 14 21 28	4 11 18 25	2 9 16 23 30	6 13 20 27	4 11 18 25	1 8 15 22 29	5 12 19 26	3 10 17 24 31	
Orientation	10								
Basic Science	4 5 5 5 5								
Cell Structure	4 5 5 5 5	4 4 5 4			5 5 E				
Tooth Histology		4 4 5 4	5 5 5		-5 5 E				
General Anatomy			5 5 5 5 5	5 4 5 5	5 5 E				
Dental Anatomy									
Oral Pathology						8 8 8 88	7 7 7	5 7 7	2 2 2 E
Hygiene									
Nutrition	2 2	2 2 2 2	2 2 2 2						
Oralhealth	4 8 8 6 6	5 5 5 4 5 5	5 5 5 5	5 4 5 4		4 4 4 4	4 4 4 4 4 4 4 4	4 4 4 4	4 4 4 E
Fluorides									
First Aid			2 2 2 2 2 2	2 2 2 2 2					
Community									
Communication	2 3 3 3 3	3 3 3 3 1 1 1		1 1		1 1 1 1 1	1 1 1 1	1 1 3 3	3 3 3 E
Clinic Assist	10 10 10 10	8 8 9 7 9 9 9 9 9	9 9 9 9 9	9 7 9 9	5 5	5 5 5 5	5 5 5 5 4	5 5 5 5	5 5 5
Law Ethics							3 3 32		
Tooth Anatomy	5 5 5 5	5 5 5 5 5 5							
Preventive Dentistry									4 4 4 E
Restorative Dentistry			12 12	12 9 12 11	10 10 E	18 18 18 18 18	18 12 12 12 10 11 11 11	10 10 10 E	10 10 10 E
Total Periods	1 2 3 4 5	6 7 8 9 10 11 12 13 14	15 16 17 18						
ToTal Week					19 20 21	22 23 24 25	26 27 28 29 30 31	32 33 34 35 36	

Annex 1-2

[2nd Year]

1st Semester

2nd Semester

Date	1st Semester					2nd Semester				
	March	April	May	June	July	August	Sept	Oct	Nov	
Subjects	1 7 14 21 28	4 11 18 23 30	2 9 16 23 30	6 13 20 27	4 11 18 25	1 8 15 22 29	5 12 19 26	3 10 17 24 31	7 14 21 28	
Fluorides			2 2 2 2 2							
Hygiene		CLINICAL				CLINICAL				
Local Anesth	4	TRAINING			Inter Semester Vacation	TRAINING	4 4 4 4		3 3 3	
Extraction										
Radiology							4 4 4 3 4 4 4			
Treatplan	1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1	1 1 1 1	1 1 1 1 1 1	1 1 1 1 1 1	1 1 1 1 1 1 1 1			
Total Week	1 2 3 4 5	6 7 8 9 10 11 12 13 14	15 16 17 18		19 20 21 22 23 24 25	26 27 28 29 30 31 32 33 34		35 36 37 38		

※ 1. All students visit to local schools to give Dental Health Lesson two hours every week.

2. Treatment plan may include Patient management, Revision of Operative theory and Pulpotomy technique.

3. “.” indicate intermediatt examination.

4. “E” indicate finil examination.

1977