

A study on improvement for national examination of dental hygienists in Korea

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1. Introduction

National health promotion act had enacted and been carried out since 1995 as an aggressive political correspondence to the increasing public health needs and as a public health assurance plan. From this institutional establishment that could consolidate public health promotion in national level, social needs and roles of a dental hygienist is emphasized¹⁾ and needs for professional healthcare workers for providing higher-quality dental health service is increasing.

Dental hygienist must pass the national dental hygienist exam enforced under the provision of the 4th Medical technicians, etc. act and obtain a licence from the Health, Welfare and Family affairs Minister, and the importance of this role as the only human resources that shares oral cure of the public is rising. Korea's

first batch of the dental hygienist came out in 1971 with 11 licensed professionals²⁾, but as of 2003, there are 21,381 dental hygienists with 2,810 enrollment in the faculty of dental hygiene of 35 universities³⁾. Since the health care sector is known to be labor intensive, with 2/3 of the sector is composed of labor force⁴⁾, it is most rational to produce highly qualified dental hygienists in order to create high quality oral care and health service.

Recently, as interest of the public in the national exam that examines the quality of a dental hygienist is increasing, a call for improvement on subjects and system of the national exam for dental hygienist is gaining momentum. Previous studies done on the national exams include conference of training and application of dental hygienist and dental health education development⁵⁾, symposium for

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the development of the national exam for public health worker⁶⁾, studies on problems and improvements of the current national exam⁷⁾, and groping for development direction of the national exam for public health worker⁸⁾, but case studies are extremely small in quantity. Also, in order to improve the national exam system, basic understanding in current educational ideology and curriculum of a dental hygienist is required. Therefore studies such as analysis of current college dental hygienist curriculum⁹⁾, dental hygienist role focused dental hygiene faculty curriculum model development study¹⁰⁾, study on college dental hygiene faculty curriculum improvement and correction¹¹⁾, exploring for the dental hygienist role focused dental hygiene faculty curriculum model development¹²⁾, and oriented direction of the school practices and clinical practices education program of dental hygiene faculty¹³⁾ are used to analyze curriculums of faculty of dental hygiene in Korea and models for curriculum are continuously presented through comparative analysis with curriculums foreign countries.

However, increased enrollment of competitively established new faculties of dental hygiene in colleges brings concern about deteriorating quality of dental hygienists, and the four year dental hygienist curriculum instituted in 2002 does not show any distinguishing features from the previous curriculum. Thus, reformation of dental hygiene curriculum is a necessity to amend and correct these problems so to create professional skill practice opportunities for dental hygienists. In addition, since an improvement of curriculum cannot exclude the

relations with the national exam in current Korean environment, without a rational improvement of the national exam system including the execution of the national exam, subjects and its range, content, banking questionnaires, improvement of the education cannot be done. Also, comparative analysis with the U.S.A. and Canada, where professionalism of dental hygienists are approved and curriculum is accepted to be the top of the world, will yield many advisable improvement ideas.

Therefore, this analysis will grasp the problems of the current national dental hygienist exam system and provide basic data for future dental hygiene curriculum improvement from comparing Canada's national exam system, which is advanced than Korea's system, in order to provide improvements for advance dental hygiene education through a rational reformation of the national dental hygienist exam.

2. Study subject and method

2.1. Study subject

The investigator has carried out a convenience sampling on the population composed of participants of the national exam and professors who work for dental hygiene education and health facilities in the country, surveyed for 15 days, from June 9th of 2008 to June 23rd of 2008, by using fax and email. Total of 172 survey papers were retrieved and 160 results, excluding dishonest results, were used as the total research data for this study. Based on the public

opinion from the collected survey data, possible improvements of the current national dental hygienist exam have been reviewed and provided improvements of the national exam using the data of the Canadian national dental hygienist exam.

2.2. Study method

This study used the survey paper as a tool, and questionnaires about the national exam was prepared by the investigator based on the studies of Hyuk-soo Moon¹⁴⁾ and Young-soon Park¹⁵⁾. Survey contents were composed of 13 questions, including 3 questions on common characteristics related questions, 3 questions on the subjects of the national exam, 1 question on the educational goal of the national exam, 3 questions on the question types of the national exam, 2 questions on the validity of the national exam, and 1 question on the necessity of the teacher's training of the national exam.

National Dental Hygiene Certification Examination Application Guide 2000¹⁶⁾ and National Board Dental Hygiene Examination Candidate Guide 2000¹⁷⁾ were used as referenced to compare with the subjects of the Korean national exam.

SPSS statistics program (Version 11.0) was used to analyze the collected data, Chi-square test and percentage were used as the analysis technique, and examinations were done with Fisher's Exact Test.

3. Study result

3.1. Survey research

3.1.1. Common characteristics of survey subjects

Distribution of the subjects based on the common characteristics showed 30.6% of college professor and 69.4% of the dental hygienist in Dental Clinic. Since the survey was targeted for recent national exam participants thus limiting the job tenure under 5 years, job tenure of less than 1 year was 31.5%, more than 1 year but less than 3 years was 45.9%, and more than 4 years was 22.5% of the subjects employed in Dental Clinic. Age distribution showed 98.2% in 20~29 year old group. For college professors, job tenure of more than 6 years but less than 10 years was 40.8%, less than 6 years was 34.7%, and more than 11 years was 24.5%. Age distribution showed 30~39 year old group the largest with 61.2%, with 40~49 year old 26.5% and 20~29 year old 12.2% following behind respectively.

3.1.2. Adequacy and necessity of subject adjustments for the current national exam

While dental hygienists employed in Dental Clinic exhibited similar opinions regarding the questions on the adequacy of the subject composition of the current national exam with 46.3% in "adequate" and 53.7% in "inadequate," 85.4% of the college employees answered "inadequate," showing statistically relevant distinction ($p=0.000$), exhibit problems within the subject compositions of the national exam.

Table 1. Common characteristics of respondents

Division		Characteristics	Frequency(%)
Age	Dental Clinic	20-29	109(98.2)
		30-39	2(1.8)
	College	20-29	6(12.2)
		30-39	30(61.2)
		40-49	13(26.5)
Place	Dental Clinic		111(69.4)
	College		49(30.6)
Job tenure	Dental Clinic	Less than a year	35(31.5)
		1-3 years	51(45.9)
		More than 4 years	25(22.5)
	College	Less than 5 years	17(34.7)
		6-10 years	20(40.8)
		More than 11 years	12(24.5)
Total			160(100)

Especially, 93.3% of the 30~39 year old age group of the college employees showed "inadequate," showing statistically relevant distinction($p=0.000$) than other age groups, shows that college employees with age older than 30 and longer job tenure were feeling problems of the subject compositions of the exam. Regarding the necessity of the subject adjustments, 91.8% of the college employees and 85% of the medical facility employees answered "adjustment needed," showing no distinctive opinion differences between two groups. However, 96.7% of the 30~39 year old age group of the college employees answered "necessary," showing statistically relevant distinction($P=0.000$), shows that aged and longer tenured college employees feel the necessity of subjects adjustment than other groups.

3.1.3. Distributions of types of national dental hygienist exam questions

Regarding the questions on the distributions of types of national dental hygienist exam questions, 100% of the college employees and 94.6% of medical workers answered were focused on text books when only 5.4% of the subjects answered were focused on practices. 97.9% and 94.5% of the subjects answered that most questions were fragmented questions on individual subjects, all subjects giving similar answers regardless of age groups and job tenures. Only 2.1% of the college employees and 5.5% of medical workers answered that there were many overall practical situations solving problems. Subjects who answered that there were many memorization and analysis questions were 86.4% of the college employees and 91.8% of the medical workers, subjects who answered that

Table 2. Subject composition appropriateness and subject composition adjustment need based on common characteristics

Division	Characteristics	Subject composition appropriateness		p	Subject composition adjustment needs		p
		Appropriate	Inappropriate		Needed	Not needed	
Places	Dental Clinic	50(46.3)	58(53.7)	0.000**	91(85.0)	16(15.0)	0.239
	College	7(14.6)	41(85.4)		45(91.8)	4(8.2)	
Dental Clinic	Age	20-29	50(47.2)	0.498	89(84.8)	16(15.2)	0.722
		30-39	0(0.0)		2(100)	0(0.0)	
	Job tenure	< 1year	17(34.0)	0.558	29(31.9)	3(18.8)	0.103†
		1≤-≤ 3years	21(42.0)		44(48.4)	6(37.5)	
College	Age	4years <	12(24.0)	0.000**	18(19.8)	7(43.8)	0.000**
		20-29	4(80.0)		3(50.0)	3(50.0)	
		30-39	2(6.7)		29(96.7)	1(3.3)	
	Job tenure	40-49	1(7.7)		13(100)	0(0.0)	
		< 5years	5(29.4)	0.122†	14(82.4)	3(17.6)	0.271†
		6≤-≤ 10year	2(10.5)		19(95.0)	1(5.0)	
		11years <	0(0.0)		12(100)	0(0.0)	

* : p<0.05, by chi-square test

** : p<0.01, by chi-square test

† : Fisher's Exact Test

there were many questions for testing memorization, analysis, and problem solving abilities at the same time were 11.4% of the college employees and 5.5% of the medical workers, and subjects who answered that there were many questions for testing problem solving abilities were 2.3% of the college employees and 2.7% of the medical workers.

3.1.4. Difficulty and demand for expertise in the national dental hygienist exam

Regarding the question that asked whether the current range of the national exam demands expertise from participants, only 2.0% of the college employees and 7.3% of the medical workers answered "yes," 71.4% of the college

employees and 67.9% of the medical workers answered "somewhat," making it the highest distribution, and 26.5% of the college employees and 24.8% of the medical workers answered "not at all." For the college employees, older age groups answered the exam does not demand expertise, and 33.3% the job tenure group of 11 or more years answered the exam does not demand expertise. Regarding the question that asked about the overall difficulty of the national exam, 61.7% of the college employees and 45.5% of the medical workers answered "appropriate," and older the age and longer the job tenure, it was likely for subjects to answer "inappropriate" for the question.

Table 3. Distribution of the national dental hygienists exam question types

Division	Characteristics		Type 1		Type 2		Type 3		
			A	B	C	D	E	F	G
Place	Dental Clinic		105(94.6)	6(5.4)	103(94.5)	6(5.5)	101(91.8)	3(2.7)	6(5.5)
	College		48(100)	0(0.0)	47(97.9)	1(2.1)	38(86.4)	1(2.3)	5(11.4)
Dental Clinic	Age	20-29	104(95.4)	5(4.6)	102(95.3)	5(4.7)	99(91.7)	3(2.8)	6(5.6)
		30-39	1(50.0)	1(50.0)	1(50.0)	1(50.0)	2(100)	0(0.0)	0(0.0)
	Job	< 1year	33(94.3)	2(5.7)	34(97.1)	1(2.9)	30(85.7)	2(5.7)	3(8.6)
	tenure	1≤-≤3year	49(96.1)	2(3.9)	49(96.1)	2(3.9)	47(94.0)	0(0.0)	3(6.0)
		4year <	23(92.0)	2(8.0)	20(87.0)	3(13.0)	24(96.0)	1(4.0)	0(0.0)
College	Age	20-29	6(100)	0(0.0)	6(100)	0(0.0)	5(100)	0(0.0)	0(0.0)
		30-39	30(100)	0(0.0)	29(96.7)	1(3.3)	23(88.5)	0(0.0)	3(11.5)
		40-49	12(100)	0(0.0)	12(100)	0(0.0)	10(76.9)	1(7.7)	2(15.4)
	Job	< 5years	17(100)	0(0.0)	17(100)	0(0.0)	13(92.9)	0(0.0)	1(7.1)
	tenure	6≤-≤10year	19(100)	0(0.0)	18(94.7)	1(5.3)	15(83.3)	0(0.0)	3(16.7)
		11years <	12(100)	0(0.0)	12(100)	0(0.0)	10(83.3)	1(8.3)	1(8.3)

A – Many text book focused questions

B – Many practice focused questions

C – Many fragmented questions on different subjects

D – Many comprehensive practical situation problem solving questions

E – Many memorization and analysis questions

F – Many problem solving skill questions

G – Many questions evaluating memorization, analysis, and problem solving skills simultaneously

Table 4. Difficulty and expertise demand of the national dental hygienists exam

Division	Characteristics		National exam difficulty		National exam expertise demand		
			Appropriate	Inappropriate	Demands	Somewhat	Not at all
Place	Dental Clinic		50(45.5)	60(54.5)	8(7.3)	74(67.9)	27(24.8)
	College		29(61.7)	18(38.3)	1(2.0)	35(71.4)	13(26.5)
Dental Clinic	Age	20-29	50(46.3)	58(53.7)	8(7.5)	72(67.3)	27(25.2)
		30-39	0(0.0)	2(100)	0(0.0)	2(100)	0(0.0)
	Job	< 1year	13(38.2)	21(61.8)	5(14.7)	20(58.8)	9(26.5)
	tenure	1≤-≤3year	27(52.9)	24(47.1)	3(6.0)	37(74.0)	10(20.0)
		4year <	10(40.0)	15(60.0)	0(0.0)	17(68.0)	8(32.0)
College	Age	20-29	4(80.0)	1(20.0)	0(0.0)	5(83.3)	1(16.7)
		30-39	18(62.1)	11(37.9)	1(3.3)	22(73.3)	7(23.3)
		40-49	7(53.8)	6(46.2)	0(0.0)	8(61.5)	5(38.5)
	Job	< 5years	9(60.0)	6(40.0)	1(5.9)	11(64.7)	5(29.4)
	tenure	6≤-≤10year	13(65.0)	7(35.0)	0(0.0)	16(80.0)	4(20.0)
		11years <	7(58.3)	5(41.7)	0(0.0)	8(66.7)	4(33.3)

3.1.5. Priorities for the national exam subject adjustment

In priorities for the national exam subject adjustment, 40.3% of the dental hygienists in Dental Clinic picked introduction to oral biology as the first, 32.3% for dental clinical practices, 16.1% for introduction to oral hygienics, 8.1% for medical laws, and 3.2% for dental radiology. 44.4% of the college employees picked introduction to oral biology as well, 14.8% for introduction to oral hygienics, 14.8% for dental clinical practices, 14.8% for medical laws, and 11.1% for dental radiology. By reviewing this data with job tenure of the subjects, 71.4% of the group with less than 5 years and 50.5% of the group with more than 11 years showed for introduction to oral biology, making it the subject that needs most adjustment. However, 30.0% of the group with more than 6 years and less than 10 years picked introduction to oral hygienics. Therefore, regardless of employment, introduction to oral biology was shown to be the subjects that needs most adjustment.

Table 5. Adjustment required subject list of the national exam according to job tenures of health workers and professors

3.2. Comparisons of the subjects of the Korean national dental hygienist exam and the Canadian national dental hygienist exam

3.2.1. Korean national dental hygienist exam

The national dental hygienist exam is enacted by the Medical technicians, etc. act to be held every year, and is carried out by the secretary of

the ministry of health and welfare as the director of the national exam. Test subjects are divided into a written examination composed of 200 questions in 5 subjects and a practical(skill) examination composed of 2 questions of practical test. In order to pass the exam, 60% of overall average and 40% of subject average of the written examination and 60% total score in the practical examination are required. This national exam carried out separately in different regions of the country.(Article 9 of enforcement regulation of Medical technicians, etc. act)

3.2.2. Canadian national dental hygienist exam

The current Canadian national dental hygienist exam is divided into a written examination and a practical examination. The Canadian national exam is composed of contents and format that is are similar to the U.S. national dental hygienist exam. National Board of Dental Hygiene Examination divided the exam into Components A that contains 350 multiple-choice test item on overall theoretical knowledge of various subjects, and Component B that tests the practical application ability. Component A, just like the written examination part of the Korean's, evaluates theoretical knowledge of participants through 200 questions, and is divided into 3 major sections that cover scientific basis for dental hygiene practice, provision of clinical dental hygiene services and community health activities. On these subjects, 5% includes behavior and other 5% include morality(ethics) of the profession. Component B can be seen as the practical examination part of

Table 5. Adjustment required subject list of the national exam according to job tenures of health workers and professors

Division	Subjects	1 rank	2 rank	3 rank	4 rank	5 rank
Dental Clinic	Introduction to oral biology	25(40.3)	14(22.6)	6(9.7)	8(12.9)	9(14.5)
	Introduction to oral hygienics	10(16.1)	19(30.6)	24(38.7)	5(8.1)	4(6.5)
	Dental clinical practices	20(32.3)	12(19.4)	9(14.5)	9(14.5)	12(19.4)
	Introduction to dental radiology	2(3.2)	10(16.1)	12(19.4)	26(41.9)	12(19.4)
	Medical laws	5(8.1)	7(11.3)	11(17.7)	14(22.6)	25(40.3)
Professor	Introduction to oral biology	12(44.4)	7(25.9)	6(22.2)	2(7.4)	0(0.0)
	Introduction to oral hygienics	4(14.8)	4(14.8)	4(14.8)	10(37.0)	5(18.5)
	Dental clinical practices	4(14.8)	10(37.0)	7(25.9)	4(14.8)	2(7.4)
	Introduction to dental radiology	3(11.1)	5(18.5)	7(25.9)	8(29.6)	4(14.8)
	Medical laws	4(14.8)	1(3.7)	3(11.1)	3(11.1)	16(59.3)
Professor Less than 5 years	Introduction to oral biology	5(71.4)	0(0.0)	1(14.3)	1(14.3)	0(0.0)
	Introduction to oral hygienics	0(0.0)	1(14.3)	0(0.0)	2(28.6)	4(57.1)
	Dental clinical practices	0(0.0)	4(57.1)	2(28.6)	1(14.3)	0(0.0)
	Introduction to dental radiology	0(0.0)	2(28.6)	1(14.3)	2(28.6)	2(28.6)
	Medical laws	2(28.6)	0(0.0)	3(42.9)	1(14.3)	1(14.3)
Professor 6-10 years	Introduction to oral biology	2(20.0)	4(40.0)	4(40.0)	0(0.0)	0(0.0)
	Introduction to oral hygienics	3(30.0)	3(30.0)	1(10.0)	2(20.0)	1(10.0)
	Dental clinical practices	2(20.0)	2(20.0)	2(20.0)	3(30.0)	1(10.0)
	Introduction to dental radiology	1(10.0)	1(10.0)	3(30.0)	4(40.0)	1(10.0)
	Medical laws	2(20.0)	0(0.0)	0(0.0)	1(10.0)	7(70.0)
Professor More than 10 years	Introduction to oral biology	5(50.0)	3(30.0)	1(10.0)	1(10.0)	0(0.0)
	Introduction to oral hygienics	1(10.0)	0(0.0)	3(30.0)	6(60.0)	0(0.0)
	Dental clinical practices	2(20.0)	4(40.0)	3(30.0)	0(0.0)	1(10.0)
	Introduction to dental radiology	2(20.0)	2(20.0)	3(30.0)	2(20.0)	1(10.0)
	Medical laws	0(0.0)	1(10.0)	0(0.0)	1(10.0)	8(80.0)

the Korean exam, but the format and the contents are very different.

While the practical examination part of the Korean national exam evaluates the overall dental hygiene management ability of participants through scaling alone, the Canadian national exam evaluates participants by organizing 150 case questions from 12~15 case reports of dental hygiene patients (including adult periodontal

patients, elderly patients, special patients, general disease patients, and children) selected and presenting 12~15 problems per patient selected, occasionally after providing information such as intraoral and extraoral photographs. Scoring more than 75 in both Component A and B will pass the exam. Certain provinces allowed participants who scored less than 75 in one section of the exam to re-test the failed section, and

demand reeducation if participants fail more than twice. However, this differs according to the provinces.

Table 6. Number of questions per subjects of Canadian national exam (Component A)

4. Colligation and device

According to the article 6 of the Medical technicians, etc. act, the national dental hygienist exam is an national exam that judges abilities of a dental hygienist as an employee of oral disease prevention and a collaborator in dental care services in order to protect and promote

public health by the state, and it evaluates the knowledge and skill of dental hygiene and health care related regulations¹⁸⁾. The basis for passing the examination of the dental hygienist is the test score.

Since the current national exam has fixed number of subjects and number of questions, it seems a regular standard is arranged, but reviewing the contents and the quality of the exam exhibited many points that need to be improved. Changes in the role of dental hygienists in Korea appear to be very different and unlike dental hygienist of the U.S. and Canada, where dental hygienists hold a firm position as preventative professionals in dental care. It is

Table 6. Number of questions per subjects of Canadian national exam (Component A)

Field	Subject	Number of questions
SCIENTIFIC BASIS FOR DENTAL HYGIENE PRACTICE(60)	Anatomic science	17
	Physiology	5
	Biochemistry and Nutrition	6
	Microbiology and Immunology	10
	Pathology	12
	Pharmacology	10
PROVISION OF CLINICAL DENTAL HYGIENE SERVICES(120)	Assessing Patient Characteristics	23
	Obtaining and Interpreting Radiographs	19
	Planning and Managing Dental Hygiene Care	30
	Performing Periodontal Procedures	27
	Using Preventive Agents	12
	Providing Supportive Treatment Services	9
COMMUNITY HEALTH / RESEARCH PRINCIPLES(20)	Promoting Health and Preventing Disease Within Groups	4
	Participating in Community Programs	8
	Analyzing Scientific Literature, Understanding Statistical	8
	Concepts, and Applying Research Results	
Total		200

not an exaggeration to say that the American dental hygiene education curriculum, which is the originating country for the education system and education contents for the field, is producing modified Korean styled dental hygienists. It is necessary to review dental hygienist education system of Korea and re-think how much of the overall dental hygiene management ability of dental hygienist is evaluated by the national dental hygienist exam. It is important to know that an improvement of the national exam system that authorizes participants of practice licenses, such as dental hygienist exam, will improve the overall quality of dental hygienists. In order to improve the quality of dental hygiene education, evaluation of how the factors of the exam such as demanded standard, test courses, contents range, test area, difficulty, the distinction of participants levels, and accuracy of grading are appropriately used in the exam must be done before. However, since this evaluation is not carried out currently, it can not positively affect the quality of education for the dental hygienist. Problems of the current national dental hygienist exam and the state policy subject problem have been already pointed out by the national board of examiners's report in 1998⁷⁾, and 84.8% of the participants of the survey report of dental hygienic professors regarding the evaluation ability of quality of dental hygienists by the national exam answered that the exam is not performing to its fullest ability to evaluate the quality⁵⁾. The survey research done on this study showed that 85.4% of the college employees and 53.7% of the medical workers answered "subject composition

is inappropriate," and 91.8% and 85.0% answered "subject composition adjustment required," showing that the biggest problem of the current national exam is the inappropriateness of the subject composition. The biggest reason for the inappropriateness was "there are too many subjects in the exam," and other reasons such as "relation to practices is too little," "distribution of subjects and marks is inappropriate," "there are unnecessary subjects," and "too many basic subjects" showed the problems similar to the previous study results. The comparison between the Canadian national exam clarifies this point too. First of all, the Korean national dental hygienist exam is not composed of subjects that can train professional dental hygienist, but is similar to the national dentist exam, making is problematic to evaluate the performance ability of the professional role of dental hygienists. Out of 200 questions of the Canadian national exam, 120 questions are for the provision of clinical dental hygiene services to evaluate the professionalism of the dental hygienist, and the contents of the questions are composed of evaluation of patient characteristics, photographing and analyzing dental radiograph, planning and execution of dental hygiene management, execution of the periodontal process, use of preventative measures, and other contents related to supporting treatment services. However, according to the Korean national exam, only two sections, dental preventive measures and scaling, of the related subject, field of introduction to oral hygienics, as oral hygiene management(40 questions), and even the contents of the practical questions are limited to

evaluate theoretical parts of the subjects, showing drastic differences with the U.S. and Canadian national exams that define, train, and evaluate dental hygienics as a professional position. This seems to be the biggest problem of the current dental hygienics education, and the reason why Korean dental hygienists do not hold professional position. In the public oral health studies section, the Korean exam allotted 40 questions divided into local community oral health, oral health administration, oral health statistics, and oral health education, while the Canadian exam allotted 20 questions for the basic principles of community health and reference analysis and investigation. This difference could not be simply compared due to drastic differences in contents. The section that evaluates the basic principles through reference analysis is not conducted in Korean dental hygienics, which can create problems following the current trend of dental hygienics and new dental hygiene technique. Also, a comparison of the dental clinical practice was impossible as it is not selected as the exam subject in the U.S. and Canada.

As pointed out above, it had been a mistake to include such a different subject, which is a subject for dentists, into the national exam for dental hygienists. Therefore, the Korean national exam exhibits a drastic difference with the Canadian exam in the education curriculum. The study has found that the introduction to oral biology as the first and the dental clinical practice as the second in the list of subjects that need to be adjusted urgently, but instead the Canadian national exam allotted 60 questions,

which is larger than the Korean exam, on the basic subjects for dental hygiene practice, and the subjects were composed of anatomical science(anatomy, histology, embryology), physiology, biochemistry, dietetics, microbiology, immunology, pathology, and pharmacology, which is larger than the Korean exam subjects composed of oral anatomy, tooth morphology, oral histology, oral pathology, and oral physiology. Also, the dental clinical practice section is irrelevant to the professional role of dental hygienists and not tested in the U.S. and Canadian national exam, and therefore is considered to be abolished in the future. The study has indicated the introduction to oral biology to be the subject that needs to be adjusted urgently, but the comparison with the Canadian national exam subjects has shown that it is more important to adjust the dental clinical practice and the introduction to oral hygienics; thus not only the subject composition of the exam, but the contents and the format of the current Korean national exam must be reformed in order to properly evaluate the execution of the overall dental hygienic process. The current difficulty of the national exam deemed to be appropriate, but since the Canadian national exam focuses more on the practical problem solving questions, an adjustment of the question type distribution is needed to focus more on the practical approach to the problems in order to recognize the professionalism of dental hygienists. In addition, as it is shown that the current national dental hygienist exam does not evaluate the overall dental hygiene operation processes but evaluates participants based on

exam subjects, this problem must be fixed in near future. This establishment of the national exam subjects and evaluation must be founded on the primary and basic understanding of the education ideology and the education curriculum. However, the survey was carried out before informing the participants of this understanding, there has been a limit in the analysis of this section of the research and must be improved upon in the future study. Also in order for studies on improvement and reformation of the current national dental hygienists exam to be conducted more effectively and in-depth, studies on the current dental hygienics curriculum should be carried out together. The dental hygienics education curriculum used until now had been developed by the dental hygienics majors, but in order to improve and fix the problems, a cooperative project between curriculum specialists and professional education curriculum developers is required. At the same time, the dental hygienics curriculum and the improvement of the national exam must operate in conjunction for dental hygienists to adapt to the field, to secure the professionalism, and to strengthen the role in the field.

5. Conclusion

The summary of the study is as follows.

1. The result of the survey research for the improving the Korean national dental hygienists exam system showed the subject compositions of the national exam deemed inappropriate and require urgent adjustment. The need for adjustment had been strongly exhibited by college employees, and older and longer the job tenure showed stronger need.
2. Most of the national dental hygienists exam question types were composed of fragmented memorization questions of different subjects, but the difficulty was appropriate and seemed professional.
3. The subject adjustment priority list of the national exams was composed in the order of the introduction to oral biology, the dental clinical practice, the introduction to oral hygienics, the medical laws, and the introduction to dental radiology, but the comparison with the Canadian national exam showed the dental clinical practice and the introduction to oral hygienics were in need for adjustment.
4. Formats of the Canadian and Korean national exams were similar, but the subject compositions and the contents were drastically different.
5. Compared to the Canadian national exam, the Korean national exam was shown to be difficult in evaluating the overall dental hygiene management ability, resulting an urgent improvement in the current national dental hygienists exam.

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18. Article 3 of enforcement of the Medical technicians, etc. act

초록

현행 치과위생사 국가시험 개선에 관한 조사

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색인 : 국민건강증진법, 구강보건의료인력, 보건진료용역, 포괄치과위생관리

목적 : 현재 우리 사회는 건강증진에 대한 욕구가 증가함에 따라 보건의료에서 질적 서비스향상이 요구되고 있고, 구강진료를 분담하는 치과위생사들도 보다 전문적인 역할을 수행하기 위해서는 지식과 기술의 수준향상이 필요하다. 이에 치과위생사의 질적 수준을 향상시키는 데 가장 빠르고 효과적인 방법이 국가시험제도이며 국가시험에서의 타당성과 신뢰성을 높이고 필요한 과목과 내용을 직무를 중심으로 조정한다면 가장 좋은 방법이라고 사료되어 현행 우리나라 치과위생사 국가시험제도에 따른 문제점을 파악하고 캐나다 국가시험 제도와의 비교를 통해 문제점을 분석하고 이에 따른 개선책을 알아보았다.

방법 : 전국 치과위생사 교육기관에 근무하는 교수와 의료기관에 종사하는 치과위생사 중에서 최근 국가시험 응시경험자를 대상으로 2008년 6월 9일부터 6월 23일까지 설문조사를 실시하였으며 E-mail 과 Fax를 이용하였다. 캐나다 국가시험제도는 National Dental Examinations American Dental Association, National Board Dental Hygiene Examination Candidate Guide자료를 사용하여 비교하였다. 자료의 분석은 SPSS통계프로그램(Version 11.0)을 이용, Chi-square 검정을 하였으며, Fisher's Exact Test에 의한 검정을 실시하였다.

결과 :

1. 국가시험과목구성은 현행 국가시험과목구성에 문제가 있는 것으로 사료되어 과목조정 필요성이 큰 것으로 나타났고, 특히 대학근무자가, 나이가 많을수록, 재직기간이 길수록 더 높았다.
2. 국가시험 문제의 유형은 암기해석 문제가 대부분이었고 난이도는 비교적 양호하였으며, 전문성도 있는 것으로 조사되었다.
3. 과목조정 필요성은 구강생물학개론, 치과임상학 순으로 상대적으로 높았다. 캐나다 국가시험과 비교해 보면 치과임상학과 구강위생학개론 분야의 조정이 더욱 필요한 것으로 나타났다.
4. 한국과 캐나다의 국가시험제도는 형식은 비슷하나 내용과 과목의 구성에서는 큰 차이가 있었다.

5. 캐나다의 국가시험과 비교 시 한국은 치과위생사의 포괄적인 치과위생관리능력을 평가하기 어려웠다.

결론 : 이상의 결과로 보면 현행 국가시험은 과목 구성이 부적절하므로 조정의 필요성이 시급한 것으로 조사되었으며, 캐나다 국가시험과는 과목구성에서 큰 차이가 있었고 치과위생사에게 요구되는 포괄적 치과위생관리능력을 평가할 수 없는 것으로 조사되어 현행 국가시험 개선이 요구되었다.