

Original

Comparison of traditional six-year and new four-year dental curricula in South Korea

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Abstract: This study aimed to compare the dental curriculum of the traditional six-year system with that of the new four-year (graduate-entry) system in South Korea. There are 11 dental schools in South Korea: six are public and five are private. Eight offer the new four-year program and the other three offer the traditional six-year program. Descriptive analyses were conducted using bibliographic data and local information along with statistical analyses such as chi-square tests. In the six-year programs, clinical dentistry subjects were taught almost equally in practical and didactic courses, while the basic science courses were taught more often as practical courses ($P < 0.0001$). In the four-year programs, both the basic science and clinical dentistry subjects were taught didactically more often; while more dentistry subjects were taught than basic sciences ($P = 0.004$). The four-year program model in South Korea is more focused on dentistry than on basic science, while both basic and clinical dentistry subjects were equally taught in the six-year program. (J Oral Sci 54, 191-196, 2012)

Keywords: curriculum; four-year dental education system; six-year dental education system; graduate-entry.

Introduction

Traditional dental education in South Korea consists of a six-year program comprised of two years of pre-dentistry (liberal arts and science) and four years of professional subjects (dentistry) (1). Several negative effects of the traditional program, such as a lack of awareness of social diversity and limited scientific creativity in biomedical research in dentistry, caused dental educators to consider admitting college graduates only, rather than high school graduates, into a four-year program of study in dental school (2). Initiatives by the South Korean government in 2003 resulted in a new dental education system that allows admission of college graduates with various academic majors (Ministry of Education, Science and Technology: Medical/dental education system improvement plan. http://mest.korea.kr/gonews/branch.do?act=detailView&dataId=155567149§ionId=b_sec_2&type=news&flComment=1&flReply=0). As part of the strategy to strengthen dental education, the government now supports the new four-year system materially and financially (3).

However, some Korean institutions have retained the traditional six-year undergraduate program.

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Universities were allowed to offer either the traditional six-year program or the new four-year program. The new four-year dental education system, also called the “graduate-entry dental school program”, combines the four years of undergraduate study (bachelor’s degree) at a different institution with the four years of dental study at the graduate level at a school of dentistry. It is a professional graduate program similar to the current dental education programs found in the United States (2). There are currently 11 dental schools in Korea; six are public and five are private dental schools. Eight of these 11 schools (Seoul, Pusan, Kyung Hee, Kyungpook, Chonnam, Yonsei, Chosun, and Chonbuk University) have started using the four-year program. However, three dental schools (Dankook, Wonkwang, and Kangnung-Wonju University) chose to maintain the traditional six-year programs.

The process for entrance and graduation in South Korean dental schools depends on the program, thus comparison is critical in this study. Any candidate who wants to enter a college or university offering the six-year dental education system is required to take a College Scholastic Ability Test (CSAT), which consists of five categories of questions and is similar to the American Scholastic Aptitude Test (SAT) (1). Prospective dental students must submit their high school academic records, recommendations, and a self-introduction document along with their CSAT scores. Candidates seeking admittance to a four-year dental education program are subject to these same requirements but also must take a Dental Education Eligibility Test (DEET), which consists of tests of reading comprehension, scientific reasoning (biology, chemistry, and physics), and perceptual ability (2,4,5). The DEET is similar to the Dental Admission Test (DAT) in the United States. In addition to the DEET scores, each school asks the applicants to meet other requirements such as an undergraduate grade point average (UGPA), certified English proficiency, interviews, oral examinations, and written essays (2,6,7). These dental schools also require completion of a pre-dentistry course to evaluate the student’s basic knowledge of natural science, humanities and sociology learned in preparatory courses. Those applicants without a prerequisite pre-dentistry course can complete their prerequisites through a part-time registration system or the Academic Credit Bank System (ACBS). The ACBS is an open educational system that recognizes diverse learning experiences gained both in and out of school and is the central agency for continuing education. It aims to provide all citizens with greater access to a variety of educational opportunities and to foster a lifelong learning society. It also seeks

Table 1 Four-year and six-year dental schools in public and private schools in Korea

	Four-year*	Six-year**	Total
Public schools	5	1	6
Private schools	3	2	5
Total	8	3	11

* After four years of undergraduate study (bachelor's degree),

** Two years of pre-dentistry and four years of professional subjects.

to innovate, diversify and maximize the educational opportunities for students studying at post-secondary institutes and adults seeking additional education and training. When the necessary ACBS approved credits are accumulated, a degree will be awarded (6,7). Dental schools in South Korea begin their academic year in March, so candidates must take the DEET and submit an application to the school by the end of the previous October.

At the end of both the six-year and the four-year programs, all Korean dental students must take the Korean National Dentist Examination (KNDE) as a requirement for graduation. The KNDE (1, National Health Personnel Licensing Examination Board: Examination statistical data. www.kuksiwon.or.kr/) is a one-day written multiple-choice exam containing questions on the knowledge and techniques required for all aspects of dental practice. The average passing rate for the KNDE during the last five years has been more than 93% (8, National Health Personnel Licensing Examination Board).

Dental education in general has undergone reforms in the last decade in various parts of the world. The transition from old to new curricula was implemented in the European Union (EU) countries in 1999 (the so-called “Bologna Declaration”) and other parts of the world (9,10). The Bologna Declaration, which harmonized the higher education system in the EU countries, helped students and staff obtain more reliable information about dental qualifications. However, an evaluation of these reforms is lacking. Therefore, the purpose of this study was to compare the dental curriculum of the traditional six-year system with that of the new graduate-entry system (four-year dental education system) in South Korea in 15 subjects/disciplines.

Materials and Methods

In Korea, most traditional six-year dental colleges have been transformed into four-year dental colleges. The authors contacted 11 dental schools by calling the office of academic affairs to obtain their published curricula. The authors also used personal and professional networks

Table 2 Curriculum hours by subject for the new four-year and the traditional six-year dental education systems in Korea [Clock hours (%)]

Subject	Category	Four-year system			Six-year system		
		Didactic	Practical	Total	Didactic	Practical	Total
1. General & Oral Anatomy, Physiology, Biochemistry, Genetics and Histology	Basic science	382* (8.2)	294 (6.3)	676 (14.5)	320 (5.6)	576 (10.1)	896 (15.7)
2. Dental Materials and Laboratory Work	Basic science	59.5 (1.3)	60 (1.3)	119.5 (2.6)	48 (0.8)	128 (2.3)	176 (3.1)
3. General and Oral Pharmacology	Basic science	76 (1.6)	15 (0.3)	91 (2.0)	64 (1.1)	96 (1.7)	160 (2.8)
4. General & Oral Pathology and Microbiology	Basic science	165 (3.6)	122 (2.6)	287 (6.2)	160 (2.8)	304 (5.3)	464 (8.2)
5. General Medicine	Non-dental	20 (0.4)	12 (0.3)	32 (0.7)	24 (0.4)	0 (0.0)	24 (0.4)
6. General Surgery	Non-dental	8 (0.2)	0 (0.0)	8 (0.2)	16 (0.3)	0 (0.0)	16 (0.3)
7. Conservative Dentistry, Endodontics and Periodontics	Dentistry	254 (5.5)	203 (4.4)	457 (9.8)	184 (3.2)	240 (4.2)	424 (7.4)
8. Pedodontics	Dentistry	59.5 (1.3)	102 (2.2)	161.5 (3.5)	56 (1.0)	128 (2.3)	184 (3.2)
9. Orthodontics	Dentistry	76 (1.6)	95 (2.0)	171 (3.7)	64 (1.1)	80 (1.4)	144 (2.5)
10. Oral Surgery, Local & General Anesthesia	Dentistry	136.5 (2.9)	49 (1.1)	185.5 (4.0)	144 (2.5)	16 (0.3)	160 (2.8)
11. Prosthodontics and Crown & Bridge	Dentistry	269 (5.8)	312 (6.7)	581 (12.5)	232 (4.1)	384 (6.7)	616 (10.8)
12. Oral & Maxillofacial Radiology and Oral Medicine	Dentistry	98 (2.1)	40 (0.9)	138 (3.0)	136 (2.4)	0 (0.0)	136 (2.4)
13. Oral Health (preventive and public health dentistry)	Mixed****	64 (1.4)	56 (1.2)	120 (2.6)	64 (1.1)	56 (1.0)	120 (2.1)
14. Other Dental Education Courses	Mixed****	128.5 (2.8)	134 (2.9)	262.5 (5.6)	96 (1.7)	0 (0.0)	96 (1.7)
15. Patient observation and direct patient care in clinic	Observation/Clinic	8** (0.2)	1356*** (29.1)	1364 (29.3)	0.0 (0.0)	2080*** (36.5)	2080 (36.5)
Total		1804 (38.8)	2850 (61.2)	4654 (100.0)	1608 (28.2)	4088 (71.8)	5696 (100.0)

* Curriculum hours for each subject (Curriculum hours for each subject/total hour), ** Clinical case studies, *** Case requirements (student case) or Internship was not included, **** Basic Science and Clinical Dentistry.

Table 3 Comparison between curriculum hours for basic science and clinical dentistry subjects in the new four-year and traditional six-year dental education systems in Korea

Category	Subject number*	Four-year			Six-year		
		Didactic	Practical	Total	Didactic	Practical	Total
Basic science	1,2,3,4	683 (23.8)	491 (17.1)	1174 (40.9)	592 (17.6)	1104 (32.9)	1696 (50.5)
Clinical dentistry	7,8,9,10,11,12	893 (31.1)	801 (27.9)	1694 (59.1)	816 (24.3)	848 (25.2)	1664 (49.5)
Total		1576 (54.9)	1292 (45.1)	2868 (100)	1408 (41.9)	1952 (58.1)	3360 (100)

*Subject number from Table 2.

of dental faculty to gather information on the curricula of these schools. Seoul National University, which represent the metropolitan area of Seoul, and Chonnam National University, which represent the more rural surrounding areas, were chosen for a side-by-side comparison of the six-year dental curriculum and the four-year dental curriculum. We would have liked to include more;

however, the four-year dental curriculum for the other schools has not been definitively released, so we prefer to wait for a final curriculum before making a comparison. The information on curriculum hours for each subject (15 subjects) in the four-year dental system was obtained from 2006 data at Chonnam National University and 2008 data at Seoul National University (11,12, School

of Dentistry, Seoul National University: Curriculum. <http://dentistry.snu.ac.kr/education/curriculum.php>), comparing the latest curriculum hours of the six-year dental system (13, Chonnam National University School of Dentistry: Curriculum. <http://dent.chonnam.ac.kr/HOME/NCommon/viewpage.php?MCODE=M002002>).

The data was analyzed to match selected parameters of pertinent information on dental education programs in South Korea. Descriptive analyses and chi-square tests were conducted to compare the traditional six-year and new four-year dental systems in South Korea.

The overall dental curricula (Table 2) were categorized into fifteen subjects and then organized into five areas [basic science, clinical dentistry, mixed (basic science and clinical dentistry), observation/clinic, and non-dental]. The curriculum hours for each subject were divided into two formats: didactic and practical. The inclusion criterion for the didactic format was lectures presented in a classroom setting. For subjects #1-14, the inclusion criteria for "practical" were activities related to hands-on experience at the laboratory bench or in the clinical simulation laboratory. For #15 in Table 2 (Observation of patients and direct patient care in clinic), "didactic" refers to clinical case studies. "Practice" means observation or direct patient care under faculty supervision. However, case requirements (student cases) or internships were not included in these data.

In addition to applying descriptive statistical methodologies to the dental curricula, the chi-square test was used to examine whether clinical dentistry subjects were taught more often than basic science subjects within each type of dental program. All analyses were performed using the SAS v.9.1.3. Statistical package (SAS Institute, Cary, NC, USA); the significance level was set at 0.05.

Results

Table 1 shows there are currently 11 dental schools in Korea: six are public and five are private.

Table 2 summarizes the curriculum hours for each subject in both types of programs in Korea. Case requirements or internships were not included. The four-year dental education program (4,654 h) included fewer hours compared to the six-year program (5,696 h). However, the annual average of curriculum hours in the four-year dental education program was 1,163.5 h, while that in the six-year program was 949.3 h. The four-year dental education program is thus more concentrated than the six-year program.

The two categories (basic science and clinical dentistry) for subjects #1-12 are summarized in Table 3. In the six-year program, the clinical dentistry subjects were

taught almost equally in practical and didactic formats, but the basic science courses were taught more often as practical courses ($P < 0.0001$). In the four-year education program, both the basic science and the clinical dentistry subjects were taught didactically more often than in practical format. Also, more clinical dentistry subjects (1,694 h) were taught compared to the basic sciences (1,174 h) ($P = 0.004$). The basic science curriculum hours taught as practical courses decreased by 56% on average in the new four-year program compared to the traditional six-year program. The number of basic science curriculum hours taught didactically in the four-year program was similar to that in the six-year program.

Discussion

As shown in Table 2, patient observation hours in clinics accounts for a large portion of the entire number of curriculum. Patient observation is defined differently in South Korea than in the United States and in European countries. As a result of the socialized dentistry health system and culture in South Korea, most patients at dental school clinics are generally referrals from local private practices seeking a diagnosis and treatment of difficult cases. Because of the difficulty of the cases, there are not enough patients for the student dentists to experience direct patient care in the dental school clinics. Therefore, the students work as a team under the supervision of faculty members. During the curriculum hours listed as subject #15 in Table 2 (Patient observation and direct patient care in clinic), a student may observe patients all day. However, if there are a sufficient number of patients and the case difficulty fits the competency level of the students, observation turns into direct patient care under faculty supervision. Accordingly, in our study, subject #15 in Table 2 (Patient observation of patients and direct patient care in clinic) was categorized as observation/clinic, which is separate from the category of clinical dentistry. In subject #15, clinical training was reduced from 2,080 h in the six-year program to 1,356 h in the four-year system. Nevertheless, the number of cases required for dental students to graduate is increasing (14).

Case requirements are the amount of pre-doctoral practice in a dental school or private hospitals. This activity is conducted under the supervision of faculty members and residents, and the students are required to make treatment plans and provide treatment. For example, the current minimum requirements for a student may be two cases of simple extraction to fulfill the oral surgery requirements, three cases of amalgam fillings and three cases of resin fillings to meet the conservative dentistry requirements, five scaling cases and three curettage cases for the peri-

odontics requirements, and one endodontic case.

To fine-tune the direct patient care experience in Korean dental schools, a minimum one-year internship in a post-graduate clinical training course is important. This internship differs from those completed in each dental school hospital or private hospital. If a student doesn't pass the KNDE, the internship examination cannot be taken. In general, the selection of interns is influenced by a student's KNDE score.

The students who want to study a dental specialty must pass a dental specialist examination after going through a one-year internship and three years of residency. Master's and Doctoral degrees are earned in a separate course of study.

Table 2 shows the breakdown of total curriculum hours (5,696 h) at the six-year dental schools [1,608 didactic hours (28.2%); 4,088 practical hours (71.8%)]. At the four-year dental schools in Korea, the total curriculum hours are 4,654 h [1,804 didactic hours (38.8%) and 2,850 practical hours (61.2%)]. The total number basic science lecture hours were less in the four-year system than the six-year, and because of this, the four-year system is noted as devoting more hours to dentistry than the six-hour program. In addition, the number of hours for clinical lectures and practice and the percentages for the entire dental education curriculum was significantly increased in the four-year education system when compared to the six-year program.

Table 3 shows that the number of practical hours of basic science subjects in the six-year dental education system has been reduced in the four-year system. However, the proportion of practical hours in the four-year system is larger than in the six-year system. Therefore the percentage of basic science practical hours is less and the practical clinical dentistry subject percentage is greater overall than the six-year curriculum. This observation is attributed to the fact that the four-year system concentrates more on clinical dentistry than on the basic sciences.

The future of dental education in South Korea is still uncertain. The positive benefits when the four-year (graduate-entry) dental program was first introduced were thought to be the inclusion of superior scientifically trained students, easing of excessive competition for dental school acceptance, increase of basic science education and research, and diverse talent training at dental schools. The drawbacks are concerns that the DEET examination will be replaced by another type of examination, and the four-year program could become a barrier to creating a graduate school of science and engineering (15,16). Although the four-year program

has been successful in South Korea, there is no guarantee that every school will implement it. It is a largely government-run program, and the schools can elect to continue to offer the traditional six-year program or switch to the new four-year program. If the four-year program is to be implemented, a test similar to the American Medical Scientist Training Program would likely be given instead of continuing to offer the DEET, which is designed for the six-year program. Thus, the DEET might be replaced, should all 11 of the dental schools decide to change to the four-year curricula. So far, many professors have observed that the positive outcomes have been outweighed by the negative ones. Therefore, the Ministry of Education, Science and Technology in South Korea announced the "Medical/Dental Education System Improvement Plan" with the main purpose of making each university autonomously select one medical/dental education system in July 2010. For example, Yonsei University currently has both traditional medical/dental colleges and graduate-entry medical/dental schools. The traditional system will be kept until the 2014 academic year, and then the improved education system will be established. The execution of improved education system will require several years; the conversion will be possible beginning with the 2015 school year when the university freshmen enter the graduate schools. Likewise, the current system of graduate-entry medical/dental schools will be kept until the 2016 school year, and school year conversion will be allowed beginning with the 2017 academic year (Ministry of Education, Science and Technology).

The scientific message of this study includes the difficulty of dental program reform. Current efforts and struggling of reform was objectively analyzed by mentioning advantages and disadvantages of the new four-year program throughout this study. Collecting the limited amount of information regarding the other Korean dental schools was a challenge in this study. However, the information gained about selected dental schools in Korea will serve as a model for other dental schools in the world with evaluating both old and new curricula, developing a clinical/didactic curriculum, preparing for a better transition from old to new curricula, designing new national dental public health policies, and calibrating the competency level of dentists. In short, the results of this study will be beneficial in countries where dental curriculum reform in the near future will be similar to that of South Korea.

The four-year type of dental program in South Korea is more focused on dentistry (1,694 h) than on basic science (1,174 h), while basic science (1,696 h) and dentistry

(1,664 h) subjects were equally taught in the six-year program. The present study contributes to a better understanding of dental curriculum reform in Korea and the world.

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