

Competencies for Entry into the Profession of Dental Hygiene

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This study was conducted to derive core and detailed competencies of dental hygienists to be utilized as educational targets to be reached by graduation as well as basic data that can be reflected in the development and improvement of dental hygiene curricula. This study analyzed publication reports from the Korean Dental Hygienists Association, the International Federation of Dental Hygienists, the Commission on Dental Accreditation, and the American Dental Education Association. Based on the academic classification system for dental hygiene studies, the components of core and detailed competencies of dental hygiene school at the time of graduation were extracted and developed through expert panel discussions. This study defined competencies at the graduation level of dental hygiene school and derived eight core competencies and their 52 detailed competencies to serve as educational objectives from four areas: professionalism, communication, clinical practice, and community and health promotion. In the future, it will be necessary to conduct self-assessments of competencies based on those developed in this study, at time of the graduation from dental hygiene school, as well as to continuously develop competency-based curricula according to entry level, knowledge level, and graduation level. Thus, it is urgently necessary to develop a system that can evaluate the competencies of dental hygienists after graduation and put this system into practical use.

Key Words: Competency-based education, Core competency, Dental hygiene, Specific competency

Introduction

Competency is defined as the ability to complete a given task. It was first discussed as an academic topic by McClelland¹⁾, who noted that human ability cannot be properly measured by traditional academic aptitude tests or intelligence tests, and proposed studying 'competency' as a method of predicting work outcomes by examining the characteristics of successful people and the spontaneous behaviors that were the source of their success. Subsequently, Spencer and Spencer²⁾ refined the concept of competency as inherent characteristics of the individual that enable them to complete an appropriate task or job

with excellence in a given profession or situation. In the field of nursing, competency includes aspects such as the ability to integrate knowledge in actual work, experience, critical thinking, technical skill, care, communication, environment, motivation, and professionalism³⁾. The Korean Accreditation Board of Nursing emphasizes on a competency-based curriculum to improve the competency of nurses and the quality of nursing education; it presents an important framework for 2-week accreditation, setting competency-based education goals at each college of nursing, striving to improve curricula and assessment methods, compiling competency profiles for the professional roles, defining required knowledge, technique, and

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attitude, and improving curricula and reinventing educational methods based on this evidence⁴). Similarly, the College and Graduate College of Dentistry Accreditation Criteria are one standard of accreditation that present methods of assessment for curriculum outcomes and suggest competencies for dentists at the national level, as well as detailed competencies for individual fields⁵). Thus, examinations for issuance, receipt, and renewal of professional licenses, permits, and qualifications are also being readjusted in accordance with competencies.

Following 50 years of quantitative growth at higher education institutions, educational institutions for dental hygiene in Korea are focusing their efforts to consistently produce high-quality academic and educational systems⁶). Choi et al.⁷) argued for the need to unify and standardize the competencies of Korean dental hygienists through comparison with entry-level academic competencies in the United States, based on the standard competencies for dental hygienists presented by the American Dental Education Association (ADEA). Kim et al.⁸) recently explored the competencies required by Korean dental hygienists, suggesting eight detailed competencies for national-level dental hygienists: integrating academic knowledge, professionalism, communication, cooperation, health improvement, oral health education, patient management, and administration. However, there are many tasks that still need to be accomplished, such as investigating competencies at the time of graduation from a given curriculum, developing standardized curriculum a based on these competencies, educating learners with the methods required to help them achieve these competencies, and evaluating their achievement of these competencies.

In order to improve the quality of dental hygiene education, it is important to strengthen the core competencies demanded of dental hygienists, and to make these core competencies the basis of dental hygiene curricula. As public health professionals, dental hygienists are responsible for the oral health of the nation and their work has a major social impact. As such, defining their identity as public health professionals, examining the competencies they need to possess, and implementing education based on these competencies is a very important founda-

tion for the overall quality of life of all members of society. Hence, the present study aims to provide a basic resource that can be reflected in future development and improvement of dental hygiene curricula. To this end, we reviewed the case of the United States, where research on the competencies of dental hygienists was first published, and, through discussion with an expert panel group, we identified core and detailed competencies that could serve as educational goals for dental hygienists to achieve by graduation.

Materials and Methods

1. Extracting core and detailed competencies for dental hygienists through an analysis of the domestic and international literature

We reviewed the definition and responsibilities of dental hygienists in Korea based on the domestic and international literature. Specifically, we examined dental hygienist competencies suggested by the Korean Dental Hygienists Association (KDHA), the International Federation of Dental Hygienists (IFDH), the U.S. Commission on Dental Accreditation (CODA)⁹), who presented dental hygiene education accreditation criteria in 2012, and the ADEA¹⁰). Five researchers stipulated core competencies centered on the definition and responsibilities of dental hygienists and the core and detailed competencies for dental hygiene at the time of graduation were extracted by domain.

2. Development of core and detailed dental hygiene competencies through an expert panel discussion

We evaluated the terminology and content validity of the core competencies by domain, and the content and validity of the detailed competencies. To this end, we held an expert panel discussion with the Chairperson of the Korean Association of Dental Hygiene Professors, the Chairperson of the Korean Society of Dental Hygiene Science, two professors of dental hygiene, and two collaborating researchers. The terminology and domains of the suggested core competencies were defined, and their suitability was evaluated. The relevance to work, timeliness, and number of the detailed competencies

Table 1. Compared of Competencies for Dental Hygiene

Classification	Category of competencies	Key word of competencies
CODA	Patient care competencies	Dental hygiene care Communication skills Health promotion Disease prevention activities
	Ethics and professionalism	Ethical decision making Professional responsibility
	Critical thinking	Self-assessment skills Life-long learning
ADEA	Core competencies	Ethics Critical thinking skills Comprehensive problem-solving Responsibility for professional actions Self-assessment skills Communication skills Providers for optimal patient care
	Health promotion and disease prevention	Health promotion Promote health-related quality of life Disease prevention or health maintenance strategies
	Community involvement	Health care system Community oral health service Patient's access to oral health service Community-based program
	Patient/client care	Advocate Dental hygiene care Assessment Dental hygiene diagnosis Planning Implementation Evaluation
	Professional growth and development	Professional goal Social network
KOREA	Professional conduct	Ethical decision making Professional behavior Self-assessment skills Life log learning Accumulate evidence
	Ethical decision making	Ethical decision making Apply Ethical principle
	Evidence based decision making and problem solving	Dental hygiene research Evidence based dental hygiene
	Communication	Understanding psychological development Effective communication
	Clinical dental hygiene	Dental hygiene care Assessment Dental hygiene diagnosis Planning Implementation Evaluation
	Clinical practice	Anxiety and dental fear care Understanding dental radiography Perform tasks for effective dental service Patient management
	Hospital administration	Utilize document Claim dental insurance Leadership
	Community and health promotion	Community oral health service Planning community-based program Evaluating community-based program

CODA: Commission on Dental Accreditation, ADEA: American Dental Education Association.

suggested for each domain was reviewed, and their suitability was evaluated.

Results

1. Comparison with competencies of U.S. dental hygienists

CODA presented accreditation criteria for dental hygiene education, in which they suggested specific classes that need to be included in curricula within four scopes: general studies, biomedical science, dentistry, and dental hygiene. The detailed competencies required by graduates in dental hygiene were dental hygiene management, ethical thinking, professional behavior, and critical thinking.

ADEA categorized the competencies required by new dental hygienists into essential core competencies, health improvement, disease prevention, community participation, application of dental hygiene management, effort to grow as a professional, and self-development. Core competencies included proper attitude as a dental hygienist, ethical awareness, and communication. Detailed competencies were presented for each core competency.

In Korea, orized the competencies required by new dental hygienists into essential core compet the oral health of the public by supporting oral health education, preventative dental treatment, dental care assistance, and administration. Specific roles for dental hygienists are oral health promotion and education, education/researcher, preventative dental practitioner, dental care assistant, and hospital administrator¹¹. IFDH defined 'dental hygienist' as a healthcare professional who helps subjects maintain optimal oral health by preventing and treating oral diseases through processes such as clinical service and education, establishment of consulting plans, and assessment. Thus, it can be said that dental hygienists should at least possess comprehensive professional clinical ability, including the appropriate knowledge, technique, and attitude in clinical dentistry and dental hygiene management at the time of graduation. Moreover, in order to properly promote oral health and prevent disease, dental hygienists need to meet the competencies of evidence-based decision making, problem solving, professional mentality,

ethical decision making, proper communication, and leadership (Table 1).

2. Core and detailed competencies for dental hygiene as education goals by domain

'Professionalism', 'communication', 'clinical', and 'health improvement and the local community' were identified as domains of dental hygiene at the time of graduation. A total of eight core competencies were suggested for each domain: professional behavior, ethical decision making, evidence-based decision making and problem solving, communication, clinical dental hygiene, clinical dentistry, hospital administration, health improvement and the local community. In addition, a total of 52 detailed competences were identified that could be set as educational goals to help achieve the core competencies, including 15 detailed competencies in the professionalism domain, two in the communication domain, 28 in the clinical domain, and seven in the health improvement and the local community domain. Looking at the detailed contents of the core competencies, dental hygienists graduating from some colleges are required to have critical thinking and the latest clinical knowledge (professional behavior), and some are required to fulfill and have knowledge about their moral and ethical responsibility for health guidance to patients in the treatment room and to the general public (ethical decision making). Some graduates are required to have the competency to communicate and interact effectively with various populations, such as patients, patients' families, colleagues, and public health specialists (communication). Some need to be able to perform dental hygiene management under the guidance of the patient/subject's dental hygienist (clinical dental hygiene), and some need to possess the knowledge and technique for basic clinical work that is essential to the responsibilities of a dental hygienist (clinical dentistry). Others need to be competent in document and hospital management (hospital administration), and some need to ascertain the demand for oral health as part of local projects to improve health and prevent disease, and to plan, implement, and assess oral health projects (health improvement and the local community). Table 2 displays the detailed competencies for each of the core competencies.

Table 2. Competencies for Entry into the Profession of Dental Hygiene

Category	Competencies		Contents
	Core	Specific	
Professionalism	Professionalism	Professional behavior	P1 Be able to commit and serve for protecting the dignity of human lives and promoting the health of mankind.
			P2 Be able to continue public health activities as an expert, and accumulate related evidence.
			P3 Have critical thinking on the general situation of the public health/medical circle and be able to apply evidence-based problem solving methods to the situation.
			P4 Be able to acquire and utilize the latest information through critical and scientific thinking.
			P5 Be able to show professional character and behavior in the field of dental services.
			P6 Be able to perform adequate self-evaluation for life-long education on the job.
			P7 Be able to know and apply ethical principles related to dental services and research.
			P8 Be able to keep patients' rights and secrets, to explain dental treatment and dental hygiene care, and to get prior consent.
			P9 Have knowledge about judicial, legislative, and administrative procedures and policies related to dental services.
			P10 Know concepts related to laws and regulations when executing an oral health program.
			P11 Be able to select subjects of dental hygiene research based on the research paradigm of the public health/medical circle.
			P12 Be able to search and review relevant literature for surveying the latest clinical knowledge and the current state of public health.
			P13 Be able to select and apply adequate tools for research.
			P14 Be able to analyze and interpret the results of research statistically.
			P15 Be able to derive the clinical and policy implications of research results, and to present the results officially to the public.
Communication	Communication	C1 Have knowledge about the psychological development of patients/clients.	
		C2 Be able to interact with patients and their families, colleagues, superiors, and other public health professionals through communication skills.	
Clinical dentistry	Clinical dental hygiene	D1 Be able to have basic medical knowledge and dental clinical knowledge, and utilize the knowledge in dental hygiene care processes.	
		D2 Be able to collect general, environmental, cultural and social information with the consent of patients/clients to the collection of personal information, and find factors influencing oral health.	
		D3 Be able to collect information on patients'/clients' systemic disease history, dental care history, and family history, and find factors influencing oral health.	
		D4 Be able to assess the level of psychological anxiety and dental fear in patients/clients.	
		D5 Be able to identify the risk factors of oral disease by investigating patients'/clients' oral health-related knowledge, attitude, and behavior.	
		D6 Be able to conduct comprehensive examinations including extraoral and intraoral clinical, oral hygiene, periodontal, radiographic assessment, and assessment of dentition, record the results in a proper way, and identify the risk factors of oral disease.	
		D7 Be able to find patients'/clients' needs related to oral health based on collected information, and make a dental hygiene judgment.	

Table 2. Continued

Category	Competencies		Contents
	Core	Specific	
		No.	
		D8	Be able to assess the current health status and potential problems, and make dental hygiene plans together with patients/clients and set priority of the plans.
		D9	Be able to distinguish between items for professional care and for self-care based on dental hygiene assessment and judgment, and make plans of dental hygiene care and education.
		D10	Be able to explain the plans of dental hygiene care and education to patients/clients and finalize the plans by obtaining their consent.
		D11	Be able to refer oral health problems beyond the dental hygiene care process to experts under the patients'/clients' consent.
		D12	Be able to control patients'/clients' pain and fear during dental hygiene care.
		D13	Be able to know and implement the scientific principles of disinfection/sterilization for the prevention of cross-infection during dental hygiene care.
		D14	Be able to perform dental hygiene interventions for preventing oral diseases.
		D15	Be able to perform customized oral health education based on professional knowledge and techniques.
		D16	Be able to execute emergency care on the occurrence of a medical emergency situation in patients/clients.
		D17	Be able to measure and interpret changes in patients'/clients' oral health status using right indexes and tools for evaluating oral health status.
		D18	Be able to evaluate the outcome of a dental hygiene intervention and patients'/clients' satisfaction with the outcome based on the patients'/clients' statements and behavioral changes.
		D19	Be able to execute care plans, care requests, and continuous care programs steadily based on the contents of dental hygiene evaluation.
	Clinical dentistry	D20	Be able to have basic medical knowledge and dental clinical knowledge, and utilize the knowledge in patient care processes.
		D21	Be able to know and implement the scientific principles of disinfection/sterilization for the prevention of cross-infection during patient care processes.
		D22	Be able to assess the level of anxiety and dental fear in patients, and lower the level of anxiety and fear during patient care processes.
		D23	Be able to understand the basic principles of dental radiography, and take and develop radiographic images for oral diagnosis.
		D24	Be able to perform tasks for effective dental services such as impression taking, installation and removal of temporary attachments, temporary filling and removal, ligation and removal of orthodontic wires.
		D25	Be able to perform patient management and oral health education related to dental services.
	Hospital management	D26	Be able to utilize various media including Hangeul Word Processor, Excel, and Power-point.
		D27	Be able to claim dental health insurance.
		D28	Be able to establish a relationship of trust and exercise leadership among the members of the organization.

Table 2. Continued

Category	Competencies		No.	Contents
	Core	Specific		
Community and health promotion	Community and health promotion	Community and health promotion	H1	Be able to have and apply principles of dental public health and theoretical knowledge of oral epidemiology.
			H2	Be able to approach health and oral health problems of community through collecting various types of data.
			H3	Be able to evaluate the oral health needs of community, available resources, and the quality and accessibility of services.
			H4	Be able to plan the details (purposes, goals, strategies, etc.) of community-based oral health promotion programs.
			H5	Be able to execute a community-based oral health promotion program systematically based on evidence-based strategic contents.
			H6	Be able to execute community oral health education in consideration of clients' characteristics according to life cycle.
			H7	Be able to select and apply indexes and methods for evaluating community-based oral health promotion programs.

Discussion

Recently, particularly in medical and dental education, the need to develop task-based competencies from conventional knowledge-based learning goals has been highlighted. At the same time, efforts are being made to set competency-based educational goals and to develop and implement curricula that allow competencies to be calculated as learning outcomes^{12,13)}. In the present study, we deduced core and detailed competencies as educational goals for dental hygienists in college, with the aim of providing basic information that can be used in the development and improvement of future dental hygiene curricula.

We were able to present required competencies for dental hygienists at the time of graduation based on the educational goals of various colleges. Using this method, we identified eight core competencies, by domain: professional behavior, ethical decision making, evidence-based decision making and problem solving, communication, clinical dental hygiene, clinical dentistry, hospital administration, and health improvement and the local community. Fifty-two detailed competencies were identified and categorized in order to aid the core competency goal achievement. The core competencies presented in this study show some similarities with the competencies presented by CODA and ADEA in most domains. By developing competencies based on the role of dental hygienists and the classification system of dental hygiene studies in Korea, we provide competencies that enable linkage between theory and practical work.

New dental hygienists take courses like clinical practice, but they experience limitations in performing independent clinical work immediately after graduation. Typically, they will spend a 1~3 month period of re-education, training under a senior hygienist¹⁴⁾. This is very similar in nursing, where new nurses receive separate education because their work performance does not meet the demands of patients or the work environment. In order to reduce the time and costs of this additional education and to improve new nurses' ability to adapt to real working environments, some authors have argued for the need to reflect such demand and real work scenarios in

nursing curricula¹⁵⁾. Consequently, the Korean Accreditation Board of Nursing has improved the quality of nursing education by continually revising education programs to produce students with the competencies demanded in domestic and international public healthcare. Currently, they are performing accreditation for nursing education and suggesting core nursing competencies at the time of graduation⁴⁾. In the field of dental hygiene, the Committee to Advance Establishment of a Korean Dental Hygiene Education Accreditation Institute was for 2010. Following the first public hearing in 2014, criteria for a Korean Dental Hygiene Education Accreditation Institute were shared at the second public hearing in December 2016, which increased interest in core competencies for dental hygiene to improve the quality of dental hygiene education. These will become important indices for preparing a balanced educational system based on cultivating professional competencies in dental hygienists. Competency-based curricula are expected to be able to minimize the discrepancy between the education and health care environments by increasing the proportion of dental hygienists achieving their required competencies by graduation.

This study suggested core and detailed competencies that are applicable to some colleges of dental hygiene. However, one limitation is that these competencies do not necessarily reflect the actual level of competency in students currently enrolled at colleges of dental hygiene. Nevertheless, the core and detailed competencies developed in this study are presented as educational goals in dental hygiene that can provide a basis to explore measures to develop, expand, and systematize future competency-based curricula. Moreover, this study is significant because it can be used as basic information to suggest competencies for dental hygienists at the time of graduation, according to the educational goals at each college, and to develop measures to standardize curricula.

In order to calculate core and detailed competencies as academic outcomes at the time of graduation and to link these with curricula, we believe it will be necessary to construct an assessment system and develop assessment tools to appropriately evaluate achievement of competencies.

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