



Korean Dental Hygienists' Job Description Based on Systematic Review

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Background: Korean dental hygienists perform various tasks under the supervision of dentists in addition to the tasks listed in the law. Many meaningful studies have been conducted to determine the actual tasks of dental hygienists, but these studies did not show common results due to the differences in research methods or designs. Hence, this study aimed to review the reported data on the tasks of dental hygienists in Korea and to clarify them based on a systematic literature review.

Methods: For the literature search, the CORe, Standard, and Ideal model presented by the National Library of Medicine was referenced. Seven databases were searched for literatures published in Korea, including PubMed, and Google Scholar. Of the 352 studies found using key words, titles, and abstracts, 46 were finally extracted based on the first and second exclusion criteria. After confirming the tasks of Korean dental hygienists in 46 literatures, 136 tasks were listed and calculated as appearance rate in the literature.

Results: The most common tasks in 46 studies were fluoride application (67.2%), radiography (65.4%), scaling (65.4%), sealant (60.7%), patient management and counseling (56.7%), tooth-brushing education (52.2%), impression taking with alginate (50.1%), and making temporary crowns (47.9%). The most mentioned tasks of dental hygienists in public health centers were fluoride application (100%), sealant (100%), oral health education (71.4%), public oral health program evaluation (71.4%), school fluoride mouth-rinsing program (71.4%), water fluoridation (57.1%), tooth-brushing education (57.1%), school oral health programs (57.1%), and public elderly oral health programs (57.1%).

Conclusion: This study showed that Korean dental hygienists had 136 tasks by reviewing 46 related studies and that the main job of Korean dental hygienists was oral disease prevention including scaling, sealant, and fluoride application.

Key Words: Dental hygienists, Job description, Systematic review

Introduction

The oral health workforce in Korea is composed of dentists, dental hygienists, and dental technicians, and dental hygienists contribute to the improvement of the public's oral health by providing treatment that prevents oral diseases¹. Dental hygiene education in Korea began

in 1965 and has made rapid progress since 2004, including the establishment of a 4-year curriculum² and the world's first doctoral course in dental hygiene³. The tasks of dental hygienists were legally prescribed in the Medical Technicians Act of 1973 and include promotion of oral health and prevention of oral diseases; however, in reality, dental hygienists perform various tasks in dental clinics

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such as dental treatment assistance and business management support. In the task description reported in 2000, the tasks of dental hygienists are divided into six classifications: oral health education, preventive dental treatment, dental treatment cooperation, public health business, business management support, and professional improvement⁴⁾. As such, dental hygienists perform various tasks under the direction and supervision of dentists in addition to the tasks listed in the law. In the last decades, some dentists delegate their duties to dental hygienists to ensure the continuous performance of their tasks. However, it is not clear whether the task is legitimate or not⁵⁾. In some cases, the tasks are not recognized as legitimate, and dental hygienists are oftentimes subject to administrative disposition. As a result, dental hygienists in Korea experience a feeling of deprivation along with a decrease in job satisfaction, and sometimes pursue a new career as they tend to have a negative perception about their job⁶⁻⁸⁾. Therefore, it is necessary to clearly confirm the tasks actually performed in the dental medical environment and conduct a job analysis accordingly. Based on this, the dental community should discuss the actual tasks performed by dental hygienists, and provision of institutional support is essential to ensure that the tasks performed are legitimate. In the meantime, many meaningful studies have been conducted to examine the actual tasks of dental hygienists in Korea, and many reference data have been obtained in order to establish an effective policy. These studies reflect the dental medical environment at the time of the investigation and propose the actual scope of responsibilities of dental hygienists. Nevertheless, it was not possible to reach a comprehensive conclusion as the finding of related research were consistent. Therefore, this study aimed to review the reported research data on the tasks, duties, and scope of tasks of dental hygienists in Korea and to clarify the tasks of dental hygienists based on a systematic literature review. Moreover, this study aimed to ensure that the tasks performed by dental hygienist are within their legal scope of practice and to our findings will serve as a basis for establishing policy agreements on the legal tasks of dental hygienists.

Research Methods

1. Literature search

For literature search, the COSI (COre, Standard, Ideal) model presented by the National Library of Medicine was referenced⁹⁾. Based on the results of the discussions of researchers, PubMed (<http://www.pubmed.gov>), and

Table 1. Keywords Used in Literatures Search

Priority	Primary keyword	Secondary keyword
1	Dental hygienist task	Dental hygienist task
2	Dental hygienist job	Dental hygienist job
3	Dental hygienist job scope	Dental hygienist task scope
4	Dental hygienist task scope	Dental hygienist job scope
5	Role of dental hygienist	Role of dental hygienist
6	Dental hygienist task area	Dental hygienist medical cooperation
7	Dental hygienist medical cooperation	Dental hygienist medical assistance
8	Dental hygienist medical assistance	Dental hygienist core competency
9	Dental hygienist core competency	Dental hygienist medical personification
10	Dental hygienist medical personification	Dental hygienist medical practice
11	Dental hygienist business management support	Dental infection/Prevention of infection
12	Dental hygienist medical practice	Dental hygienist awareness
13	Dental infection/prevention of infection	Dental hygienist image
14	Dental radiation safety	Dental hygienist recognition
15	Dental hygienist job analysis	Dental medical dispute
16	Dental hygienist awareness	Dental hygienist performance
17	Dental hygienist image	
18	Dental hygienist recognition	
19	Medical law revision	
20	Dental medical dispute	
21	Oral health education	
22	Health promotion	
23	Preventive dental treatment	
24	Dental hygienist performance	

Google Scholar (<https://scholar.google.co.kr>), which is a foreign database that can be used for general literature search; another five databases, where literature published in Korea can be searched; and their own journal sites related to dental hygiene that are recognized in Korea, were used for the study. Selected domestic databases include Korean academic information (<http://kiss.kstudy.com>), academic research information service (<http://www.riss.kr>), paper search (<http://www.papersearch.net>), Academic Education Center (<https://www.earticle.net>), DBpia (<http://www.dbpia.co.kr>), Journal of Dental Hygiene Science

(<http://www.jkdhs.org>), and Korean Dental Hygiene Society (<http://www.jksdh.or.kr>). In order to select the appropriate keywords to be used in the literature search, some previous studies were analyzed, and the first keyword was selected through a meeting with all of the researchers. After searching the literature using the primary keyword, the secondary keyword was extracted through deletion or correction of duplicates when searching the literature (Table 1).

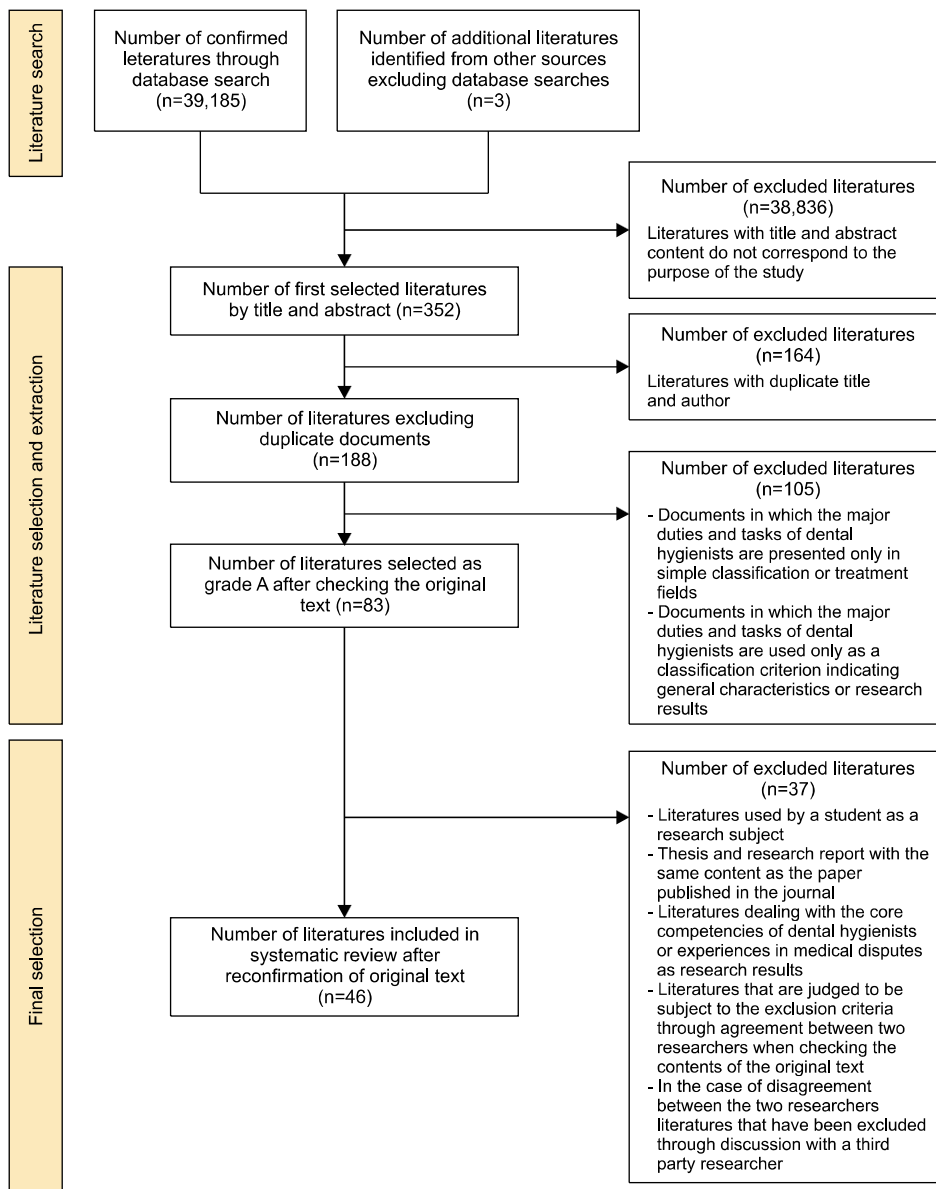


Fig. 1. Process of selection and exclusion of papers modified from PRISMA 2009 flow diagram¹⁰⁾.

2. Paper extraction

The literature search was only conducted from 2000 to 2019 to reflect the recent trend, and a total of 39,188 articles were searched. The numbers of searches by keyword were as follows: 18,024 (46.0%) for dental hygienist role, 4,635 (11.8%) for dental hygienist tasks, 2,508 (6.4%) for dental hygienist Jobs, and 2,368 (6.0%) for dental hygienist image. After screening the titles and abstracts of each article, those that did not match the research purpose were initially excluded; as a result, only 352 articles were extracted. Afterward, duplicate literatures and literatures that did not provide sufficient data on the tasks of dental hygienists were excluded during the 2nd and 3rd exclusion processes. Over 83 studies were extracted during the third selection process, and 37 studies that were judged to be insufficiently related to this study after screening the original text and reviewing the consensus of the researchers were further excluded (Fig. 1)¹⁰. A total of 46 literatures were finally selected (Table 2), of which 19 were conducted before 2010 and 27 after 2010. Of the total selected literature, 22 were journals (47.8%), 19 were dissertations (41.3%), and 5 were reports (10.9%).

3. Presentation of data

After confirming the tasks of Korean dental hygienists in 46 literatures, each task was listed in specific terms. Then, a mark was applied when the dental hygienist's tasks appeared in each article, and the appearance rate in the entire literature was calculated. Most dental hygienists in Korea work in dental clinics, but more than 1,500 dental hygienists work in public health centers and implement public oral health programs. Therefore, it is necessary to classify the tasks of dental hygienists working in dental clinics and those working in public health centers. Of the 46 studies that were finally selected, 39 evaluated the tasks of clinicians, 6 evaluated the tasks of a public health center, and 1 evaluated the tasks of a clinical and dental hygienist at the same time. Therefore, based on 40 studies, including the tasks of a clinical dental hygienist and 7 literatures including the tasks of a health center dental hygienist, the rates of the appearance of the tasks of a clinical dental hygienist and a public health center dental

hygienist were presented, respectively.

Results

A systematic literature review found that dental hygienists performed up to 136 tasks (Table 3). The most common tasks reported in 46 studies were fluoride application (67.2%), radiography (65.4%), scaling (65.4%), sealant (60.7%), patient management and counseling (56.7%), tooth-brushing education (52.2%), and impression taking (alginate) (50.1%). Preventive treatment-related tasks such as fluoride application, scaling, and sealant appeared more frequently, and oral health education tasks such as patient management and counseling, and tooth-brushing education also frequently appeared. In addition, studies related to general dental treatments such as alginate impression taking, temporary crowns making, setting of temporary crowns, and application of temporary filling were investigated in the literature. More than half of the 40 studies studied on clinical dental hygienists included scaling, internal/external radiography, temporary crowns making, sealant, tooth-brushing education, and temporary filling as the tasks of dental hygienists. The task with the highest frequency was scaling (74.4%), followed by Intraoral radiography and panorama taking (71.8%), patient management and counseling (64.1%), and fluoride application (61.5%). In more than half of papers, impression taking (alginate, 56.4%), temporary crowns making (53.8%), setting of temporary crowns (53.8%), sealant (53.8%), tooth-brushing education (51.3%), and temporary filling (51.3%) were reported as the tasks of dental hygienists. In seven studies on dental hygienists working in public health centers, fluoride application and sealant accounted for 100% of the tasks performed by dental hygienists, oral health education, school fluoride mouth-rinsing program, public oral health program evaluation accounted for 71.4%, and tooth-brushing education, education to use oral health products, oral examination, public elderly oral health program, water fluoridation, school water fluoridation, school oral health program accounted for 57.1%. Dental hygienists working in public health centers perform 67 out of 136 tasks, and they are conducting oral disease prevention tasks as well

Table 2. The 46 Literatures Selected Finally for Tasks Analysis of Korean Dental Hygienists

Number	Main author	Publication year	Title	Publisher or journal	URL
1	JH Sung	2000	A study on the roles of dental hygienists at the public health centers in Korea	Journal of Korean Academy of Dental Hygiene	http://kadh.or.kr/index.php?mid=board_CnLa25&category=2291&document_srl=2330&listStyle=list
2	MY Hwang	2002	A study on the Curriculums for the Department of Dental Hygiene - Based on the Tasks of Hygienists and the Causes For the National Qualification Examination	Bulletin of Dongnam Health University	https://kmbase.medic.or.kr/Main.aspx?d=KMBASE&i=0974620020200020123&m=VIEW
3	JH Yoo	2003	Usefulness of dental hygiene education curriculum in the public oral health service performance	Yonsei University	https://ir.ymlib.yonsei.ac.kr/bitstream/2282913/128826/1/T008015.pdf
4	EH Kim	2004	A study on the work of dental hygienists and nurse aides	Inje University	http://imgsvr.riss4u.net/contents3/td_contents8/09865/664/09865664.pdf
5	JR Park	2004	A research on the expansion of dental hygienists' work	Korean Dental Hygienists Association	https://www.kdha.or.kr/news/report.aspx
6	MH Lim	2004	A Study on Dentists' Awareness About Dental Hygienists' Works and Duty Division	Journal of Korean Academy of Dental Hygiene	http://kadh.or.kr/index.php?mid=board_CnLa25&category=2293&document_srl=2385&listStyle=list
7	PK Cho	2004	An analysis of the job performance in operative restoration by dental hygienists	Journal of Korean Academy Dental Hygiene Education	http://www.jksdh.or.kr/view/CHOSAB-04-2-11.pdf
8	KJ Won	2005	A empirical study on job education of dental health administrative personnel	Gangneung National University	http://www.riss.kr/search/detail/DetailView.do?p_mat_type=be54d9b8bc7cdb09&control_no=9af4767c6610fe8d
9	SY Kim	2006	(A) Study on the curriculum for dental hygienist education	Dankook University	http://www.riss.kr/search/detail/DetailView.do?p_mat_type=be54d9b8bc7cdb09&control_no=a1fd5bff7709a242ffe0bd3ef48d419
10	SS Bae	2006	Development of role model for dental hygienist in the changed environment medical service	Yonsei University	http://www.riss.kr/search/detail/DetailView.do?p_mat_type=be54d9b8bc7cdb09&control_no=b90c1a558a6d1a6dffe0bd3ef48d419
11	YS Ahn	2006	Comparison of job description and turnover trend among dental hygienists and assistant nurses in dental clinics	Journal of Korean Academy of Oral Health	http://210.101.116.28/W_files/kiss61/21101049_pv.pdf
12	SJ Shin	2007	A study on the estimation of the number of dental hygienist and their practice	Journal of Dental Hygiene Science	https://kmbase.medic.or.kr/KMID/1023420070070010025
13	SH Shim	2007	A study on the job awareness of dental hygienists and their job performance	Journal of Korean Society of Dental Hygiene	http://kiss.kstudy.com/thesis/thesis-view.asp?key=2853967
14	YA Cheng	2007	A predictive study on the role and function of the dental hygienist in Taiwan	International Journal of Dental Hygiene	https://doi.org/10.1111/j.1601-5037.2007.00236.x
15	YJ Kang	2008	An analysis of the completion and recognition of preceptorship course for fresh-dental hygienists	Gyeongsang National University	https://dcollection.gnu.ac.kr/public_resource/pdf/000000011540_20201116132226.pdf

Table 2. Continued 1

Number	Main author	Publication year	Title	Publisher or journal	URL
16	YS Kim	2008	A study on the current state and weight of dental hygienists' works	Journal of Korean Society of Dental Hygiene	http://www.jksdh.or.kr/view/CHOSAB-08-3-08.pdf
17	SS Park	2008	A Study on Elaboration of Dental Hyenists' Participated Items in Implant Treatment	Gyeongsang National University	http://www.riss.kr/search/detail/DetailView.do?p_mat_type=be54d9b8bc7cdb09&control_no=8121c9e1bb4df2d4ffe0bdc3ef48d419
18	MS Wang	2008	The roles of dental hygienist in Korea	Dankook University	http://lib.dankook.ac.kr/dcollection/public_resource/pdf/000000032005_20201116133237.pdf
19	YH Cho	2008	Recognition of the job jurisdiction and job satisfaction of the dental hygienists and nursing aids	Kyungwon University	http://gachon.dcollection.net/public_resource/pdf/000000305245_20201116141741.pdf
20	YN Park	2010	Dental office manager current conditions by scale of Korean dental clinic	The Journal of the Korea Contents Association	https://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE01543074&nodeId=NODE01543074&language=ko_KR
21	JH Park	2010	Dentists' opinions for dental hygienists' roles in Korea	Journal of Korean Academy of Oral Health	http://journaleng.kstudy.com/ISS_Detail.asp?key=2844604&tname=kiss2002&code=YqldZWtoSqVtJTNEInAIOCUMN/B%20Z%20xLJTNEVHJpZQ==
22	YJ Song	2010	The working range analysis for the dental hygienists' education program and legal system improvement	Yonsei University	https://ir.ymlib.yonsei.ac.kr/handle/22282913/137418
23	MO Ha	2010	A study on the job analysis of dental hygienist in Gwangju	Journal of Korean Society of Dental Hygiene	http://kiss.kstudy.com/thesis/thesis-view.asp?key=2884088
24	GA Kang	2011	A Study of Influential Factors on Dental Hygienists' Duties and their Job Satisfaction	Journal of Korean Academy of Dental Hygiene	http://kadh.or.kr/index.php?mid=board_CnLa25&category=2274&document_serial=2640&listStyle=list
25	HJ Noh	2011	A Study on the Realization of Work of Dental Hygienists in Public Health Centers	Korean Dental Hygienists Association	https://www.kdha.or.kr/news/report.aspx
26	JR Park	2012	The 2nd Job Analysis Study of Dental Hygienist	Korea Health Personnel Licensing Examination Institute	https://kiss.kstudy.com/public/public3-article.asp?key=60013748
27	YS Cho	2011	Review: Clinical Dental Hygiene Education and Practice based on Dental Hygiene Process	Journal of Dental Hygiene Science	http://kiss.kstudy.com/thesis/thesis-view.asp?key=2935724
28	YL Kwak	2013	Dentists' awareness of Dental hygienists' work	KyungHee University	http://khu.dcollection.net/public_resource/pdf/200000063746_20201116154712.pdf
29	JH Kwon	2013	The management efficiency between the oral health clinic and oral health center system	Dankook University	http://lib.dankook.ac.kr/dcollection/public_resource/pdf/000000176872_20201116154906.pdf
30	SY Ahn	2013	Some dental hygienist by career expectations regarding clinical work done in the field of business studies	Journal of Korean Society of Dental Hygiene	http://www.dbpia.co.kr/Journal/articleDetail?nodeId=NODE08990380
31	SK Park	2015	Educational Needs on National Oral Health Project among Community Dental Hygienists	Yonsei University	https://dcollection.yonsei.ac.kr/public_resource/pdf/000000137689_202011161546.pdf

Table 2. Continued 2

Number	Main author	Publication year	Title	Publisher or journal	URL
32	SS Bae	2015	The standard of Dental hygienists' clinical job	Korean Dental Hygienists Association	https://www.kdha.or.kr/news/report.aspx
33	JY Kim	2016	Associations of performance and perception on preventive dental care tasks with job satisfaction among some dental hygienists	Chosun University	http://chosun.dcollection.net/public_resource/pdf/200000266188_20201116162347.pdf
34	JS Lee	2016	Organization Structure of Dental Hospital and Job Analysis of Dental Hygienists	Namseoul University	http://nslib.dcollection.net/public_resource/pdf/200000196894_20201116162505.pdf
35	SH Chae	2016	Research on dental hygienists' clinical skill proficiency in core dental hygiene competency	Journal of Korean Society of Dental HygieneJ	https://doi.org/10.13065/jksdh.2016.16.05.651
36	Virtanen	2016	The professional role of a dental hygienist in Finland – educators' views	International Journal of Dental Hygiene	https://doi.org/10.1111/idh.12166
37	CH Kim	2017	The awareness of dental hygienist regarding the content of clinical practice education and importance of duty	Journal of Korean Society of Dental Hygiene	https://doi.org/10.13065/jksdh.2017.17.06.1067
38	SE Moon	2017	A study on the validity of the range of periodontal treatment by dental hygienists	Korean Dental Hygienists Association	https://www.kdha.or.kr/news/report.aspx
39	YH Ha	2017	Mongolian and Korean dentists' opinions about the role of dental auxiliary workforce	Dankook University	http://lib.dankook.ac.kr/dcollection/public_resource/pdf/000000188553_20201116163918.pdf
40	SM Bae	2018	Evaluation of Dental Hygienist Job Validity according to Judgment Standard of Medical Practice in Medical Law	Journal of Dental Hygiene Science	https://doi.org/10.17135/jdhs.2018.18.6.357
41	CY Kang	2019	Dental Hygienist's Professionalism and Health Insurance in Korea	Yonsei University	https://dcollection.yonsei.ac.kr/public_resource/pdf/000000518344_20201116171430.pdf
42	KJ Kim	2019	A survey of the working scope understanding between dental hygienists and chair-side dental assistants among dental students in Seoul	Seoul National University	https://dcollection.snu.ac.kr/public_resource/pdf/000000155246_20201116171600.pdf
43	AO Kim	2019	A comparison of dental hygienists' legal duties among nations: Korea, USA and Canada	Journal of Korean Society of Oral Health Science	http://www.riss.kr/search/detail/DetailView.do?p_mat_type=1a0202e37d52c72d&control_no=9f0d6c37c49e012ab36097776a77e665
44	JW Yun	2019	Improvement of legal system regarding the scope of practice of dental hygienist	Donggeui University	http://dongeui.dcollection.net/public_resource/pdf/200000227795_20201116192350.pdf
45	YK Han	2019	A survey of dentists' opinions on the performance of dental hygienists	Journal of Korean Academy of Dental Administration	https://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE09260727
46	SJ Hwang	2019	Frequency and time of actual duties of some dental hygienists	Journal of Korean Academy of Dental Administration	https://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE09260728

Table 3. Frequency of Appearance of Literature on Each Task of Dental Hygienists

Number	Task	Appearance rate (%)		
		Total	Clinical dental hygienists	Public dental hygienists
1	Fluoride application	67.2	61.5	100
2	Intraoral radiography and panorama taking	65.4	71.8	28.6
3	Scaling	65.4	74.4	14.3
4	Sealant	60.7	53.8	100
5	Patient management and counseling	56.7	64.1	14.3
6	Tooth-brushing education	52.2	51.3	57.1
7	Impression taking (alginate)	50.1	56.4	14.3
8	Temporary crowns making	47.9	53.8	14.3
9	Setting of temporary crowns	47.9	53.8	14.3
10	Temporary filling	45.8	51.3	14.3
11	Diet education	43.5	43.6	42.9
12	Impressions taking (precision)	41.4	46.2	14.3
13	Health insurance claim	41.4	46.2	14.3
14	Oral health education	39.0	33.3	71.4
15	Prevention of infection in the dental clinic	37.1	43.6	0
16	Equipment and material management	37.1	43.6	0
17	Tooth prophylaxis	37.0	38.5	28.6
18	Removal of excess cement	37.0	41.0	14.3
19	Materials/document management	34.9	38.5	14.3
20	Treatment assistance	34.8	35.9	28.6
21	Taking the medical history	32.8	38.5	0
22	Gingival cord packing	32.8	38.5	0
23	Surgery preparation (extraction and implants, oral and maxillofacial minor surgery)	32.8	38.5	0
24	Preparation of medical equipment	32.7	35.9	14.3
25	Teeth whitening	32.7	35.9	14.3
26	Application of rubber dam	32.7	35.9	14.3
27	Education to use oral health products	32.5	28.2	57.1
28	Vital sign check	30.6	35.9	0
29	Application of the matrix band	30.6	35.9	0
30	Orthodontic wire ligation	30.6	35.9	0
31	Model making	30.5	33.3	14.3
32	Radiographic management	28.3	30.8	14.3
33	Manegement and disinfection of instruments	28.3	30.8	14.3
34	Manpower training and management	28.3	33.0	0
35	Oral examination	28.2	23.1	57.1
36	Root planing	26.2	30.8	0
37	Probing periodontal pocket	26.2	30.8	0
38	Application of orthodontic Elastics	26.2	30.8	0
39	Fabrication of tooth whitening tray	24.0	28.2	0
40	Instrument polishing	24.0	28.2	0
41	Cement mixing	24.0	28.2	0
42	Restorative material mixing	24.0	28.2	0
43	Individual tray making	24.0	28.2	0
44	Medical waste management	24.0	28.2	0
45	Oral hygiene treatment plan	23.9	25.6	14.3
46	Emergency treatment in the dental clinic	21.8	23.1	14.3
47	Intramuscular injection	21.8	25.6	0
48	Periodical oral health care	21.8	23.1	14.3

Table 3. Continued 1

Number	Task	Appearance rate (%)		
		Total	Clinical dental hygienists	Public dental hygienists
49	Cavity filling	21.8	23.1	14.3
50	Bite registration	21.8	25.6	0
51	Assistance of extraction, implants, and oral and maxillofacial minor surgery	21.8	25.6	0
52	Precautions delivery before and after surgery	21.8	25.6	0
53	Receiving dental expenses	21.8	25.6	0
54	Arrangement of equipment	21.8	25.6	0
55	Topical anesthesia	19.7	23.1	0
56	Preparation for local anesthesia	19.7	23.1	0
57	Sensitive tooth treatment	19.7	23.1	0
58	Care of sedated patients	19.7	23.1	0
59	Seperating	19.7	23.1	0
60	Reception of target person	19.6	20.5	14.3
61	Medical record management	19.6	20.5	14.3
62	Oral microbial test	19.5	15.4	42.9
63	Bad breath measurement	19.5	17.9	28.6
64	Dental caries activity test	19.5	17.9	28.6
65	Taking cephalometric radiography	17.4	20.5	0
66	Usage of intraoral camera	17.4	17.9	14.3
67	Education of stretching head and neck muscles for TMD patients	17.4	20.5	0
68	Intraoral and extraoral inspection	17.4	20.5	0
69	Removal of Implant prosthetic screw	17.4	20.5	0
70	Bonding of orthodontic bracket	17.4	20.5	0
71	Disinfection of the surgery area	17.4	20.5	0
72	Education of orthodontic devices usage	17.4	20.5	0
73	Dental plaque index measurement	15.2	15.4	14.3
74	Professional dental plaque management	15.2	12.8	28.6
75	Deciduous teeth extraction	15.2	12.8	28.6
76	Removal of fixed orthodontic device	15.2	17.9	0
77	Precaution education after treatment	15.2	17.9	0
78	Taking facial photograph	13.1	15.4	0
79	Infiltration anesthesia	13.1	15.4	0
80	Attachment/removal of periodontal pak	13.1	15.4	0
81	Electric test of pulp vitality	13.1	15.4	0
82	Education for dental disease prevention	13.0	12.8	14.3
83	Making oral health education materials	12.9	7.7	42.9
84	Suction	10.9	12.8	0
85	Preparing for mini screw placement	10.9	12.8	0
86	Stich-out	10.9	12.8	0
87	Smoking cessation guidance	10.9	12.8	0
88	Public elderly oral health program	10.7	2.6	57.1
89	School fluoride mouth-rinsing program	10.6	0	71.4
90	Public oral health program evaluation	10.6	0	71.4
91	Computed tomography taking	8.8	10.3	0
92	Guide to unit chair	8.8	10.3	0
93	Oral hygiene management record	8.8	10.3	0
94	Use of light curing unit	8.8	10.3	0
95	Tooth shade selection	8.8	10.3	0
96	Dressing after removing healing abutment	8.8	10.3	0

Table 3. Continued 2

Number	Task	Appearance rate (%)		
		Total	Clinical dental hygienists	Public dental hygienists
97	Final polishing after occlusal adjustment	8.8	10.3	0
98	Radiograph reading	8.8	7.7	14.3
99	SP crown mounting	8.8	10.3	0
100	Public oral health program for the disabled	8.6	2.6	42.9
101	Water fluoridation	8.5	0	57.1
102	School water fluoridation	8.5	0	57.1
103	School oral health program	8.5	0	57.1
104	Other roles related to oral health care	6.6	7.7	0
105	Management the record and works related to dental technician	6.6	7.7	0
106	Administrative management	6.5	5.1	14.3
107	Public oral health promotion program	6.5	2.6	28.6
108	Establishment of community oral health plan	6.4	0	42.9
109	Survey of community oral health program	6.4	0	42.9
110	Public oral health program for the infants	6.4	0	42.9
111	Removal of exogenous pigmentation	4.3	5.1	0
112	Conservatory treatment	4.3	5.1	0
113	Application of liner	4.3	5.1	0
114	Block out with wax to the interdental area	4.3	5.1	0
115	Impression coping connection	4.3	5.1	0
116	Biopsy preparation	4.3	5.1	0
117	Public sealant program	4.3	0	28.6
118	Public oral health program for the pregnant women	4.3	0	28.6
119	Handling laser equipment	2.2	2.6	0
120	Ultrasound/ physical treatment and hot pack for TMD patients	2.2	2.6	0
121	Apply adhesive inside the tray	2.2	2.6	0
122	Interdental cleaning	2.2	2.6	0
123	Sedation anesthesia (N ₂ O gas) management	2.2	2.6	0
124	Inlay setting	2.2	2.6	0
125	Public oral health center installation	2.1	0	14.3
126	Administrative work for public oral health program	2.1	0	14.3
127	Oral health statistics	2.1	0	14.3
128	Survey for community oral health	2.1	0	14.3
129	Evaluation of community oral health program	2.1	0	14.3
130	Public oral health program using vehicles with dental unit-chair	2.1	0	14.3
131	Customized oral health program with visiting	2.1	0	14.3
132	School tooth-brushing program	2.1	0	14.3
133	Public oral health program connected with other health programs	2.1	0	14.3
134	Public oral disease prevention program	2.1	0	14.3
135	Other medical treatment program	2.1	0	14.3
136	Other administrative civil affairs	2.1	0	14.3

TMD: temporomandibular joint dysfunction, SP: stainless steel primary.

as planning, execution, managing, and evaluation oral health programs in the community. Of the 67 tasks performed by dental hygienists in public health centers, 33 tasks were not performed by clinical dental hygienists.

Discussion

Clarifying the tasks of dental hygienists ensured that these tasks are efficiently performed, and a high-quality dental medical service is provided by accurately indicating

the dental hygienists scope of responsibilities in each job. Objective and scientific evidence and analysis related to the scope of tasks of dental hygienists are required to promote the public oral health. Therefore, this study conducted a systematic review based on the evidence provided in the literature on the tasks of dental hygienists. As a result of the systematic review, dental hygienists performed 136 tasks. The tasks of dental hygienists most discussed in the study were fluoride application, scaling, sealant, and oral health education, such as patient management and counseling, and tooth brushing education.

Among the 136 dental hygienist tasks identified during the literature review, most of the tasks were within the legal scope of their practice, while some were not considered legitimate. In some cases, the tasks that had been performed by dental hygienists were interpreted as illegal tasks, and those that were performed in the past were no longer allowed in current practice. The remarkable development of the dental health industry would have changed the perception of the dental hygienist's job, but the professionalism and autonomy of dental hygienists are still limited. Therefore, an effort must be made to standardize the tasks of a dental hygienist in order to improve the oral health of the public.

If the legality of a dental hygienist's job is not guaranteed, professionalism can be undermined. This will reduce the dental hygienist's job satisfaction and increase the turnover rate. Such situation will become an obstacle in the use of dental hygienists as part of the oral health workforce and will inhibit the improvement of dental treatment. Therefore, the standard tasks of dental hygienist that reflect the current dental medical environment should be established.

Although the boundary for the distinction between root planing and calculus removal is unclear, root planing is not currently recognized as a legal dental hygienist job. Probing, calculus removal, and root planing cannot be separately considered as tests and treatments to maintain periodontal health. Therefore, they must all be recognized as legal tasks. Implant treatment was rapidly popularized as it was recognized as a medical care benefit item covered by the health insurance. Accordingly, the proportion of implant-related tasks of dental hygienists is increasing.

Dental hygienists not only assist with implant surgery, but also perform tasks before and after implant surgery and prosthetics such as removal of implant prosthetic screws, dressing after removal of healing abatement, and removal of sutures. Therefore, it is necessary to recognize the tasks that reflect this situation. In orthodontic treatment, wire removal was included in the tasks of a dental hygienist in the revised Medical Engineers Act, but the interpretations of other tasks remain unclear. Under the guidance of a dentist, dental hygienists are allowed to remove orthodontic brackets, orthodontic elastic application, and separating. Therefore, other orthodontic treatment items, except for bracket mounting, which greatly influence the results of orthodontic treatment, need to be recognized as part of the dental hygienist's tasks. The application of anesthesia is recognized as the task of a nursing assistant in the general medical field, whereas the application of anesthesia is not recognized as the task of a dental hygienist in the dental field. The administration of anesthesia should also be recognized as a dental hygienist's task, considering the difficulty and risk of the task. With the rapid development of medical technology, the number of equipment used in dentistry is expanding. Various radiological diagnostic imaging devices and equipment, such as laser and ultrasound, are widely used in dental hospitals and clinics. Dental hygienists are responsible for handling and maintaining of these equipments. The tasks of dental hygienists in providing dental medical services are not fixed and constant. Hence, it is necessary to expand the dental hygienists' scope of responsibilities based on the current dental care environment.

The future-oriented tasks of dental hygienists include reading radiographs, prescribing medicines and supplies, examining patients for oral cancer, and managing eating and swallowing disorders. Since radiography is essential in dental hygiene assessment and is used as a tool for imparting oral health education to patients, it can be included as a legal work of dental hygienists under the guidance of a dentist. Prescribing appropriate drugs or supplies for each patient during oral health management should be included in the task of a dental hygienist to provide quality dental services and to improve the oral

health of visiting patients. In addition, as the oral cancer test kit is continuously developed, it is simpler and easier to use. Dental hygienists can identify oral cancer by conducting an examination during the period of oral health management, hence, the oral cancer test should be part of the task of a dental hygienist.

The difference between the legal duties of dental hygienists prescribed in the current Medical Engineers Act and in the Enforcement Decree and the actual work performed by dental hygienists is that a dental hygienist is an unlicensed medical practitioner and infringes on the public's right to receive a safe oral health care. Therefore, most of the tasks performed by dental hygienists are dental medical practices and should be performed in accordance with the relevant laws and enforcement decrees in order to protect the public health rights to quality and safe oral health care.

Dental hygienists must be oral health care professionals who perform dental hygiene practices with independence, self-determination, and autonomy. Therefore, it is necessary to revise the law according to the frequency, difficulty, importance, and urgency of performing the tasks of a dental hygienist to maintain a high level of professionalism. This does not mean simply expanding the task of a job. Revising the law will improve the efficiency of dental treatment, provide high-quality oral treatment, and enable the public to receive legally safe oral treatment from dental hygienists. Therefore, it is necessary to expand the area and to determine the scope of responsibilities of dental hygienists for the promotion of public oral health.

Notes

Conflict of interest

No potential conflict of interest relevant to this article was reported.

Ethical approval

This study is a review-based study and does not require an IRB review.

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