

A needs assessment for a master's program in dental public health in Jeddah Saudi Arabia

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Objectives: The Faculty of Dentistry at King Abdulaziz University in Jeddah, Saudi Arabia, is planning a master's program in dental public health (DPH) to address the lack of adequate DPH professionals in the country. A needs assessment survey or situational analysis is typically recommended as the foundation of any curriculum development process. We conducted this survey to understand the level of DPH expertise existing in the country, to identify needs and gaps, and to explore perceptions in the area of DPH.

Methods: A DPH competency based survey was emailed to all onsite Saudi faculty members, all DPH practitioners in Jeddah city, and a random sample of dental interns (n = 122). The questionnaire collected information about participants' demographics, knowledge of DPH, preferred method for gaining knowledge about DPH, perceptions about a new master's program in DPH, preferred teaching and delivery methods, prerequisite education, and self-assessment of participants' own DPH competency levels. Descriptive statistics, chi-square or Fisher's exact statistics, and proportional odds ratios were calculated to analyze data.

Results: There was a total of 105 respondents (86.1%). About 98% had some knowledge of DPH. The most preferred method to gain knowledge on DPH was seminar series (47.6%). The most preferred methods for teaching instruction were using a "list of discussion topics" and "providing examples," and the most preferred method for delivery of coursework was "face-to-face classroom activities with online readings and assignments." The most preferred prerequisite education was having a bachelor's degree in dentistry. Most participants considered themselves as having moderate experience and basic range of knowledge of DPH practices and competencies.

Conclusion: The survey has helped assess the participants' views on the need for a graduate program in DPH. It is a preliminary step in designing a well-structured program, which will address the needs and gaps in oral public health in the country and inform the development of course content.

Keywords: needs assessment, situational analysis, education, dental public health

Background

Dental public health (DPH) is defined by the American Board of Dental Public Health as:

[...] the science and art of preventing and controlling dental diseases and promoting dental health through organized community efforts. It is that form of dental practice which serves the community as a patient rather than the individual. It is concerned with the dental education of the public, with applied dental research, and with the administration of group dental care programs as well as the prevention and control of dental diseases on a community basis.¹

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Public health dentists promote oral health by:

- assessing the oral health needs of the community;
- developing and implementing oral health policy; and
- providing programs and services that address oral health issues.

Many dentists work within public health settings to enhance the traditional DPH infrastructure. Many do so without formal public health training. These public health settings include, but are not limited to: city, provincial, and regional health departments; correctional facilities; nursing and other long-term care facilities for the elderly and those with various disabilities; school-based health programs; and free and/or volunteer clinics.

The Core Public Health Functions Steering Committee developed the framework for the Essential Services in 1994.² This steering committee included representatives from the United States Public Health Service agencies and other major public health organizations. The following Essential Services provide a working definition of public health and a guiding framework for the responsibilities of local public health systems:

1. to monitor health status to identify and solve community health problems;
2. to diagnose and investigate health problems and health hazards in the community;
3. to inform, educate, and empower people about health issues;
4. to mobilize community partnerships and actions to identify and solve health problems;
5. to develop policies and plans that support individual and community health efforts;
6. to enforce laws and regulations that protect health and ensure safety;
7. to link people to needed personal health services and assure the provision of health care when otherwise unavailable;
8. to assure competent public and personal health care workforce;
9. to evaluate effectiveness, accessibility, and quality of personal and population-based health services;
10. and to research for new insights and innovative solutions to health problems.

The Faculty of Dentistry at King Abdulaziz University (KAUFD) is planning a master's program in DPH to address the lack of adequate DPH professionals in the country. In order to design a comprehensive program, it is essential to conduct needs assessment to understand the level of DPH expertise existing in the country, to identify

needs and gaps, and to explore overall perception in the area of DPH.

A needs assessment or situational analysis is typically recommended as the foundation of any curriculum development process.³ Unlike the traditional approach to education where teachers determine what content needs to be learned, teach it, and then test to see if the content was learned, needs assessment is based on expected behavior; that is, "competencies." Competency-based training requires that educators and the stakeholders identify the necessary knowledge, skills, and behaviors as applied in real working conditions and settings.⁴ This will increase the likelihood that results will contribute to effective training that will raise performance levels. Additionally, needs assessments help identify existing resources or their lack thereof in the given setting that could be harnessed during the development and implementation of the curriculum. It is a powerful tool for clarifying and validating true needs that are necessary for making sound educational decisions. Therefore, integrating needs assessment throughout the curriculum development process can help assure that the program does not create an either/or situation, but rather benefits both the learners and the society.⁴

In 1997, The American Association of Public Health Dentistry (AAPHD) developed new competency statements and performance indicators for the specialty of DPH. These competencies help define the specialty and provide a base for educational curricula and the specialty board examination.⁵ The Centers for Disease Control and Prevention and the Association for Prevention Teaching and Research, in a published document entitled "Competencies-to-Curricula Toolkit," explain and emphasize the process of converting competencies into curriculum and training modalities.⁶ To move from competencies to curricula, the following steps are recommended: (1) specify the audience; (2) develop learning objectives; (3) assess the time availability of the learner; (4) determine how and when learning will be measured; (5) determine expected outcomes; (6) determine content and availability; (7) match teaching methods to the audience; (8) develop curriculum; and (9) evaluate the learner after the materials have been presented.⁶

We will use a similar approach in order to develop a competency-based curriculum that meets the goals and objectives of a DPH master's program, addresses them in the local context, and continually adapts them in response to institutional priorities and community needs.⁷ A needs assessment survey was conducted among Saudi dental professionals as an initial step to determine the need for DPH education.

Methods

This study utilized a cross-sectional design to assess the needs for developing a master's program in DPH. The protocol of the study was approved by the Research Ethics Committee of the Faculty of Dentistry at KAUFU.

Survey population

All of the onsite Saudi faculty members ($n = 83$) at KAUFU, all Saudi DPH practitioners from outside KAUFU in the city of Jeddah ($n = 5$), and a random sample of 34 dental interns were included in the needs assessment survey. The survey was first emailed on May 30, 2012. Reminders were sent 2 weeks later. The survey was emailed again to nonresponders on September 1, 2012 and December 1, 2012. The collection of surveys was closed on December 27, 2012.

Instrument

A competency-based self-administered survey was designed (see Supplementary materials). Some of the survey questions were adapted and modified from questions in a paper published on the needs assessment of a graduate-level course on optical networking,⁸ and some were adapted from questions from Ghore et al.⁹ Other questions were added to address needs assessment specific to a DPH master's program.

The first part of the questionnaire collected information on demographics including age, gender, qualifications, current job titles, and specialization in dentistry. The second part of the questionnaire assessed the dental professionals' knowledge of DPH; perceptions about a new master's program in DPH; modes of delivery, and materials and strategies of teaching; and professionals' perceptions regarding the impact of a master's program on DPH in the country. We used a four-point Likert scale to score the responses. The scale ranged from 1 to 4, where 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. In addition, the participants were asked to rank a list of skills, knowledge, or abilities most needed by DPH practitioners. A five-point Likert scale was used where 5 = very important, 4 = important, 3 = moderately important, 2 = of little importance, and 1 = unimportant. The third and final part of the questionnaire asked the participants to self-assess their own competency level in DPH. We used a self-assessment rating scale (1–6) that has been validated and used extensively by Ghore et al⁹ in a "program evaluator competencies self-assessment tool," as part of professional development sessions, graduate-level seminars, and introductory program evaluation courses that conduct a self assessment. The list of skills and knowledge, as well as the core competencies for DPH were adopted from

the competencies given by the AAPHD. The participants were asked to rank the importance of these competencies to their type of work using the five-point Likert scale where 5 = very important, 4 = important, 3 = moderately important, 2 = of little importance, and 1 = unimportant.

Data analysis

The survey responses were entered in an Excel database (Microsoft Corporation, Redmond, WA, USA) and analyzed in SAS version 9.2 (SAS Institute Inc, Cary, NC, USA). The analysis began with descriptive statistics such as frequencies, percentages, and average scores for variables where appropriate. We compared response scores for questions on the preferred method to gain knowledge of DPH using a chi-square statistic or Fisher's exact test in cases where the numbers in the cells were less than five. The relationship between gender and age with responses for the preferred method of instruction, preferred method of delivery of instructions, and prerequisite education for DPH was evaluated. The participants were asked to check more than one preference for each option listed under these questions; thus, each option received an individual Likert score. Since the responses were ordinal, a proportional odds ratio was used for comparison. We also modeled self-competency scores across two age categories (<30 and ≥ 30 years) using proportional odds ratio. For the purpose of analysis we modeled the probability of being in a lower score category in the ordered value list (1 to 6 or 1 to 4). We used "male" as the referent category for gender, and the " ≥ 30 " age group for the two age categories.

Results

A total of 105 persons responded to the survey. The overall response rate was 86.1%. Among the respondents, 60 (57.1%) were males and 45 (42.9%) were females. The participants were almost equally distributed in three age categories; 47 (45.6%) participants were less than 30 years, 26 (25.2%) participants were between 30 and 40 years, and 30 (29.1%) were more than 40 years of age. Based on their current position, the survey was comprised of 44 dental faculty (41.9%), 20 demonstrators (20.4%), 32 dental interns (30.5%), seven consultants (6.7%), one general practitioner (0.9%), and one dental hygienist (0.9%). We have reported only the primary appointments of all participants, but several participants held two positions. For example, a participant's primary appointment was as a dental faculty member, but he/she may also have been a private practitioner or a public health dentist. The qualifications of the participants included

50 (47.6%) with a Bachelor of Dental Science, 23 (21.9%) with a master's degree, 31 (29.5%) with a doctorate degree and one (0.9%) with a bachelor's degree in dental hygiene. The distribution of specialties among the participants was as follows: general dentistry (32.4%), preventive dental sciences (24.8%), conservative dental sciences (15.2%), oral and maxillofacial rehabilitation (12.5%), oral and basic clinical sciences (11.4%), and DPH (3.8%). Table 1 shows the baseline characteristics of the respondents.

The descriptive statistics of responses to questions on knowledge about DPH, preferred method of gaining knowledge about DPH, need for a master's program in DPH, as well as respondents' perceptions regarding the impact of DPH education on oral health issues in the country are presented in Table 2. Almost all (98.1%) of the respondents had some knowledge about DPH. The most preferred method to gain knowledge about DPH reported by respondents was seminar series (47.6%) followed by workshop (43.8%), a certificate program (21.9%), and a master's degree program (17.1%). The participants were questioned about the impact of DPH education on several oral

Table 1 Descriptive statistics of study participants (N = 105)

Characteristics	N (%)
Age	
<30 years	47 (45.6)
30 to <40 years	26 (25.2)
≥40 years	30 (29.1)
Missing	2
Gender	
Male	60 (57.1)
Female	45 (42.9)
Qualifications	
Bachelor's in dental sciences	50 (47.6)
Master's	23 (21.9)
Doctorate	31 (29.5)
Other	1 (0.95)
Primary appointment/position	
Dental faculty	44 (41.9)
Demonstrator	20 (20.4)
Consultant	7 (6.7)
General practitioner	1 (0.95)
Intern	32 (30.5)
Dental hygienist	1 (0.95)
Specialty	
Conservative dental sciences	16 (15.2)
Oral and maxillofacial rehabilitation	12 (12.5)
Preventive dental sciences	26 (24.8)
Oral and basic clinical sciences	11 (11.4)
Dental public health	4 (3.8)
General dentistry	34 (32.4)
Missing	2 (1.9)

Abbreviation: N, number.

Table 2 Knowledge, attitude, and perception regarding DPH education (N = 105)

	N (%)
Knowledge of DPH	
Yes	103 (98.1)
No	2 (1.9)
Need for developing a master's program in DPH	
Strongly agree	69 (66.4)
Agree	31 (29.8)
Disagree	2 (1.9)
Strongly disagree	2 (1.92)
Missing	1 (0.95)
Preferred method of gaining DPH knowledge [†]	
Master's degree program	18 (17.1)
Certificate program	23 (21.9)
Workshop	46 (43.8)
Seminar series	50 (47.6)
Don't know	1 (1.0)
	Average score*
Impact of DPH education	
Promotion of oral health	3.7
Delivery of oral health care services	3.6
Prevalence of oral diseases in the Kingdom	3.5
Research in the field of dental public health	3.7
Oral health care policy decisions	3.4

Notes: *Scores: 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree; [†]N is >105 because participants checked more than one answer.

Abbreviations: DPH, dental public health; N, number.

health-related topics. According to the survey participants, a DPH education will have an almost equal impact on the promotion of oral health, the delivery of oral health care services, the prevalence of oral diseases in the Kingdom, research in the field of DPH, and oral health care policy decisions. The average Likert score ranged from 3.4 to 3.7. Finally, 95.1% of the participants agreed that a master's program in DPH was necessary. A total of 69 out of 105 participants (66.4%) answered "strongly agree," while 31 (29.8%) answered "agree." Only four strongly disagreed or disagreed with the need for developing a master's in DPH at KAUFU.

The participants' educational preferences for a DPH master's program are presented in Table 3. They were asked to rank the most preferred teaching material useful for the master's program in DPH from a list of options which included textbooks, instructor slides (content), collection of examples, workbook of homework problems, solution guide to homework problems, database of test questions, and a list of discussion topics. The "collection of examples" and the "list of discussion topics" each received the highest score (3.5), whereas "database of test questions" received the lowest score (2.9) as the preferred methods and strategies for teaching a master's in DPH. The range of responses for each method/strategy of teaching is presented in Figure 1. The most

Table 3 Respondents' educational preferences for a DPH master's program

	Average score*
Preferred method of teaching instruction	
Textbook	3.4
Instructor slides (content)	3.3
Collection of examples	3.5
Workbook of homework problems	3.3
Solution guide to homework problems	3.2
Database of test questions	2.9
List of discussion topics	3.5
Preferred method of delivery of instructions	
Exclusively face-to-face classroom activities	2.7
Emphasize face-to-face classroom activities with online readings and assignments	3.3
Half online activities and half classroom activities	3.0
Emphasize online activities with classroom meetings	2.6
Entirely online (class never meets face-to-face)	1.6
Prerequisite education for DPH master's program	
Bachelor's degree in dental surgery	3.5
Dental hygiene degree	2.7
Bachelor's in medicine and surgery	2.7
Any bachelor's degree	2.1

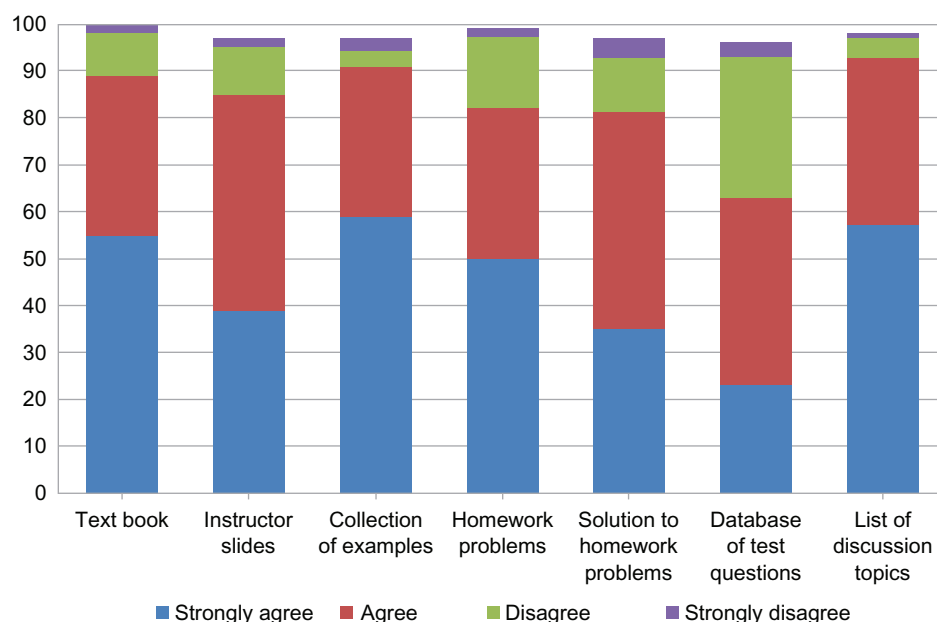
Notes: *Scores: 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree.

Abbreviation: DPH, dental public health.

preferred method of delivery of a master's in DPH course instructions was mainly face-to-face classroom activities with online readings and assignments (average score = 3.3) as compared to half online activities and half classroom activities (average score = 3.0), exclusive face-to-face classroom activities (average score = 2.7), and mainly online activities

with classroom meetings (average score = 2.6). The majority of respondents were not in favor of an exclusively online (class never meets face-to-face) delivery method (average score of 1.6). The range of responses for each delivery method is presented in Figure 2. The most preferred prerequisite qualifications for DPH master's degree students was having a Bachelor of Dental Science (average score = 3.5), followed by a bachelor's degree in medicine and surgery (average score = 2.7) or dental hygiene (average score = 2.7), with the lowest score for a bachelor's degree in any other field (average score = 2.1).

We compared relationships between gender and age categories with response scores for questions on type of program preferred, preferred method of instruction, preferred method of delivery of instructions, and prerequisite education for DPH master's students using proportional odds ratios. Results of the analysis found significant difference among both males and females in terms of their preferences for one of the four preferred methods to gain DPH knowledge. Women were less likely to prefer the choice of a master's degree program (odds ratio = 0.2; 95% confidence interval = 0.1–0.7) as compared to men (Table 4). There were no significant differences between men and women for preferred method of instruction, method of delivery of instructions, or prerequisite education. Comparison among the two age categories (<30 years and ≥30 years of age) found no significant differences among the two groups across most of the variables evaluated except for five of the options, which significantly differed

**Figure 1** Preferred teaching materials for a DPH master's program.

Abbreviation: DPH, dental public health.

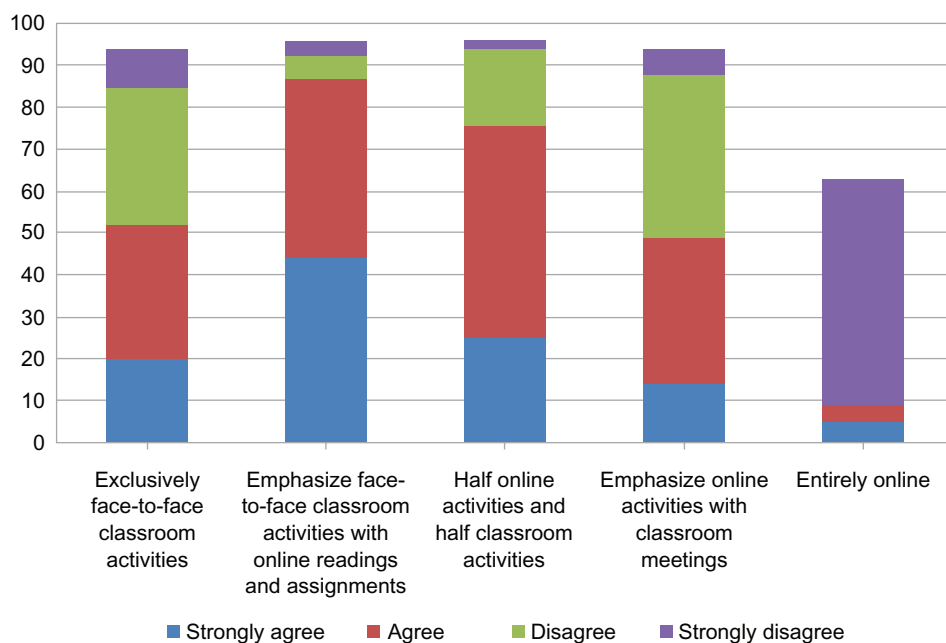


Figure 2 Preferred method of delivery of DPH master's courses.

Abbreviation: DPH, dental public health.

Table 4 Comparisons of scores for preferred method of knowledge, preferred method of instruction, delivery of instructions, and prerequisite education for DPH by gender

	Female N = 75 [†]	Male* N = 63 [†]	Odds ratio	95% confidence intervals		P-value
Preferred method of DPH knowledge						
Master's degree program (yes)	5	13	0.2	0.1	0.7	0.006 [#]
Certificate program (yes)	9	14	0.4	0.2	1.0	0.0523
Workshop (yes)	27	19	1.1	0.5	2.4	0.7765
Seminar series (yes)	33	17	2.0	0.9	4.4	0.0804
Don't know (yes)	1	0				
	N (mean)	N (mean)				
Preferred method of instruction						
Textbook	57 (3.5)	43 (3.3)	0.5	0.1	1.6	0.2228
Instructor slides (content)	56 (3.3)	42 (3.4)	0.7	0.2	1.9	0.4465
Collection of examples	57 (3.5)	40 (3.5)	0.7	0.2	2.1	0.4753
Workbook of homework problems	57 (3.4)	42 (3.2)	0.4	0.1	1.4	0.1513
Solution guide to homework problems	58 (3.2)	39 (3.2)	1.3	0.4	3.9	0.6551
Database of test questions	56 (2.8)	40 (2.9)	1.3	0.5	3.8	0.6180
List of discussion topics	55 (3.5)	43 (3.5)	2.0	0.6	6.4	0.2565
Preferred method of delivery of instructions						
Exclusively face-to-face classroom activities	55 (2.6)	39 (2.8)	1.5	0.7	3.1	0.306
Emphasize face-to-face classroom activities with online readings and assignments	57 (3.3)	39 (3.4)	1.2	0.5	2.6	0.693
Half online activities and half classroom activities	56 (3.1)	40 (3.0)	0.9	0.4	2.1	0.895
Emphasize online activities with classroom meetings	54 (2.5)	40 (2.8)	1.8	0.8	3.9	0.131
Entirely online (class never meets face-to-face)	54 (1.5)	38 (1.7)	1.2	0.5	2.8	0.615
Prerequisite education						
Bachelor's degree in dental surgery	59 (3.5)	44 (3.5)	0.9	0.4	1.9	0.697
Dental hygienist	58 (2.6)	41 (2.8)	1.7	0.8	3.7	0.169
Bachelor's in medicine and surgery	58 (2.6)	42 (2.8)	1.6	0.7	3.2	0.242
Any bachelor's degree	58 (2.0)	40 (2.1)	1.1	0.5	2.4	0.744

Notes: *Males are the referent category; [†]total is more than total number of female and male participants because participants checked more than one answer; [#]statistically significant.

Abbreviations: DPH, dental public health; N, number.

between the two (Table 5). Participants below 30 years of age were more likely to prefer a certificate program to gain DPH knowledge (odds ratio = 2.9; 95% confidence interval = 1.1–7.7); were more likely to have a lower score for use of textbooks and workbook of homework problems; and were more likely to have a lower score for a preference of a Bachelor of Dental Science as a prerequisite education as compared to those 30 years and above. Moreover, the participants under 30 years of age were less likely to have a lower score for exclusive face-to-face classroom activities.

The participants' ranking of the knowledge, skills, and abilities that they perceive as most needed by DPH practitioners are presented in Table 6. All the skills listed were ranked as very important or important. The least average scores were given to skills such as negotiation abilities, political sense, and having knowledge about computers and informatics (average score = 4.2). Maximum scores were given to knowledge of clinical dentistry and public health

(average score = 4.7), ability to work effectively with a multidisciplinary team (average score = 4.7), and ethical considerations (average score = 4.9).

Finally, the participants were asked to assess their own level of competency across ten DPH competencies identified by the AAPHD. The participants were also asked to rank the importance of each of these competencies in their own work. Table 7 provides the average score for self-assessment and ranking across the ten competencies listed. The results of the self-assessment of competencies found that most participants considered themselves as having a moderate amount of experience and basic range of knowledge of DPH practices and competencies, with average scores ranging between 2.6 and 3.9. The participants were most competent in incorporating ethical standards in oral health programs and activities (average score = 3.9), criticizing and synthesizing scientific literature (average score = 3.9), and communicating and collaborating with

Table 5 Comparisons of scores for preferred method of knowledge, preferred method of instruction and delivery of instructions, as well as prerequisite education for DPH by age

	<30 years N = 57 [†]	≥30 years* N = 69 [†]	Odds ratio	95% confidence intervals		P-value
Preferred method of DPH knowledge						
Master's degree program	7	11	0.8	0.2	2.1	0.5828
Certificate program	15	8	2.9	1.1	7.7	0.0292 [#]
Workshop	21	25	1.1	0.5	2.3	0.8713
Seminar series	13	25	0.9	0.4	2.0	0.8810
Don't know	1	0				
	N (mean)	N (mean)				
Preferred method of instruction						
Textbook	44 (3.0)	56 (3.8)	9.5	3.9	23.0	<0.0001 [#]
Instructor slides (content)	44 (3.4)	53 (3.3)	0.8	0.4	1.8	0.3567
Collection of examples	43 (3.5)	54 (3.5)	0.7	0.3	1.6	0.1597
Workbook of homework problems	44 (3.0)	55 (3.6)	4.0	1.8	8.9	0.0006 [#]
Solution guide to homework problems	44 (3.0)	53 (3.3)	1.8	0.8	3.8	0.1387
Database of test questions	44 (2.8)	52 (2.9)	1.3	0.6	2.8	0.8415
List of discussion topics	43 (3.4)	55 (3.6)	2.1	1.0	4.8	0.0637
Preferred method of delivery of instructions						
Exclusively face-to-face classroom activities	45 (3.0)	49 (2.4)	0.3	0.1	0.7	0.0023 [#]
Emphasize face-to-face classroom activities with online readings and assignments	44 (3.2)	52 (0.4)	1.8	0.8	3.9	0.1451
Half online activities and half classroom activities	43 (3.1)	53 (3.0)	0.7	0.3	1.6	0.4309
Emphasize online activities with classroom meetings	44 (2.6)	50 (2.6)	1.0	0.5	2.2	0.9121
Entirely online (class never meets face-to-face)	43 (1.7)	49 (1.5)	0.7	0.3	1.6	0.4492
Prerequisite education						
Bachelor's degree in dental surgery	46 (3.2)	57 (3.7)	3.6	1.5	8.3	0.003 [#]
Dental hygienist	45 (2.7)	54 (2.7)	1.0	0.5	2.2	0.93
Bachelors' in medicine and surgery	45 (2.5)	54 (2.8)	1.8	0.8	3.6	0.132
Any bachelor's degree	45 (2.2)	53 (2.0)	0.7	0.3	1.4	0.3117

Notes: *≥30 years of age is the referent category; [†]total is more than total number of female and male participants because participants checked more than one answer; [#]statistically significant.

Abbreviations: DPH, dental public health; N, number.

Table 6 Skills, knowledge, or abilities most needed by DPH practitioners

	Average score*
Knowledge of clinical dentistry and public health	4.7
Leadership abilities, communication skills, and both oral and written interpersonal skills	4.6
Ability to work effectively with a multidisciplinary team	4.7
Coalition and constituency building; advocacy skills	4.2
Negotiation abilities; political savvy; problem solving; computers, technology, and informatics; marketing	4.2
Use of media in health promotion; research skills; administrative skills; assessment, policy development, and assurance	4.5
Health delivery systems; financing mechanisms; evidence-based dentistry, grantsmanship; fundraising	4.2
Ethics	4.9

Notes: *Scores: 5 = very important, 4 = important, 3 = moderately important, 2 = of little importance, 1 = unimportant.

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groups and individuals on oral health issues (average score = 3.9). They scored least on competencies related to advocating for, implementation of, and evaluation of public health policy (average score = 2.6); designing and understanding the use of surveillance systems to monitor oral health (average score = 2.7); and developing resources, as well as implementing and managing oral health programs for populations (average score = 3.0). Overall, the average score for self-assessment did not exceed the average mean of four. Most participants ranked the competencies as important for their work except for “design and understand

the use of surveillance systems to monitor oral health,” which they ranked as moderately important.

To test for differences between younger and older dental professionals, we modeled self-competency scores across the two age categories (<30 years and ≥30 years of age). The results found that participants in the younger age category (<30 years) were consistently more likely to have lower scores of self-assessed DPH competencies compared to those in the older age group (Table 8).

Discussion

Overall, the collected data emphasize the need for initiating a DPH program. The results indicated that the majority (95%) of participants agreed that it is necessary to offer a master’s degree program in DPH at KAUFUD. They believed that a master’s program in DPH will have an impact on the promotion of oral health, the delivery of oral health services, prevalence of oral diseases, research in oral public health, and oral health care policy decisions in the country.

These same participants who reported a need for a master’s program at KAUFUD indicated a preference for seminar series or workshops to gain knowledge about DPH. Though these results may at first seem contradictory, at second glance, they are not. Our study population is comprised mainly of faculty members and specialists who work in academic positions and hold master’s and doctorate degrees in specific fields of dentistry. They acknowledge the need for a master’s education in DPH in their institute specifically and in the country in general. However, as far as their own academic/

Table 7 Assessment and ranking of DPH competencies

	Average score	
	Self-competency assessment*	Ranking importance of competencies [†]
Plan oral health programs for populations	3.1	4.1
Select interventions and strategies for the prevention and control of oral diseases and promotion of oral health	3.5	4.2
Develop resources, implement, and manage oral health programs for populations	3.0	4.0
Incorporate ethical standards in oral health programs and activities	3.9	4.2
Evaluate and monitor dental care delivery systems	3.4	4.1
Design and understand the use of surveillance systems to monitor oral health	2.7	3.9
Communicate and collaborate with groups and individuals on oral health issues	3.9	4.2
Advocate for, implement, and evaluate public health policy, legislation, and regulations to protect and promote the public’s oral health	2.6	4.1
Critique and synthesize scientific literature	3.9	4.2
Design and conduct population-based studies to answer oral and public health questions	3.4	4.2

Notes: *Scores 1–2: Developing awareness/building knowledge; limited repertoire; limited experience; unaware of potential problems; unaware of questions to ask. Scores 3–4: Applying knowledge routinely; basic repertoire; moderate amount of experience; solves problems as they arise; aware of questions to ask and able to access resources to answer the questions. Score 5–6: Using knowledge fluently and effectively; advanced repertoire; extensive experience; anticipates problems before they arise; poses questions to the field; sought input. [†]5 = very important, 4 = important, 3 = moderately important, 2 = of little importance, 1 = unimportant.

Abbreviation: DPH, dental public health.

Table 8 Comparison of self-competency assessment of DPH competencies by age

	Self-competency assessment*		<30 years		
	<30 y (N = 16)	≥30 y (N = 37)	Odds ratio	95% CI	P-value
Plan oral health programs for populations	2.4	3.4	3.9	1.9–8.1	0.0003
Select interventions and strategies for the prevention and control of oral diseases and promotion of oral health	2.6	3.7	4.9	2.3–10.5	<0.0001
Develop resources, implement, and manage oral health programs for populations	2.2	3.3	4.7	2.2–9.9	<0.0002
Incorporate ethical standards in oral health programs and activities	3.1	4.0	3.3	1.6–6.9	0.0013
Evaluate and monitor dental care delivery systems	2.7	3.6	4.1	1.9–8.7	0.0002
Design and understand the use of surveillance systems to monitor oral health	2.2	3.0	2.9	1.4–6.1	0.0035
Communicate and collaborate with groups and individuals on oral health issues	3.2	4.0	3.3	1.6–6.8	0.0013
Advocate for, implement, and evaluate public health policy, legislation, and regulations to protect and promote the public's oral health	2.0	3.0	4.4	2.1–9.3	0.0001
Critique and synthesize scientific literature	2.4	4.6	26.8	10.3–70.1	<0.0001
Design and conduct population-based studies to answer oral and public health questions	2.4	3.7	6.3	2.9–13.7	<0.0001

Notes: 30 years of age is the referent category. *Score 1–2: developing awareness/building knowledge; limited repertoire; limited experience; unaware of potential problems; unaware of questions to ask. Score 3–4: applying knowledge routinely; basic repertoire; moderate amount of experience; solves problems as they arise; aware of questions to ask and able to access resources to answer the questions. Score 5–6: using knowledge fluently and effectively; advanced repertoire; extensive experience; anticipates problems before they arise; poses questions to the field; sought input.

Abbreviations: DPH, dental public health; N, number.

professional needs, they prefer to gain specific knowledge and skills in DPH pertinent to their field of specialty through less intensive programs.

The need for a master's program in DPH is further supported by the results of the self-assessed competency level for DPH competencies identified by AAPHD, which ranged from 2.5 to 4. These results suggest that most participants considered themselves as having moderate amounts of experience and a basic range of knowledge of DPH practices and competencies, thus identifying a need for a structured education in DPH. In addition, the average ranking of importance of DPH competencies was more than 4, indicating that the dental professionals considered these competencies important in their field of work.

The results of the levels of DPH competencies among various dental professionals and the importance that they gave to individual competencies will help in designing course structures, as it will allow course objectives to be focused in areas where the competency levels are lower and importance is ranked higher. The survey also provides insights on the preferred teaching materials and mode of instruction in a master's degree program. Since there was an overall agreement on using all the methods of teaching materials including textbooks, instructor slides, and homework, the graduate-level course needs to be structured using a combination of all of these teaching methods. Based on the analyzed data, it is recommended that a graduate course in DPH is delivered either by traditional means (exclusively face-to-

face instruction) or in a hybrid form, which emphasizes face-to-face classroom activities, but combines those with online readings and assignments. Furthermore, considering the high rate of disagreement, it is not recommended that an entirely online format be used for course delivery. These results, however, limit the options of distance learning education for practitioners who may not have adequate time to attend classes because of their busy schedules. It is possible that the expansion of the survey to include general or private practitioners may provide alternative insights on distance learning for DPH. An online format of teaching has several advantages such as offering flexibility to the students in terms of time and schedule, reducing costs for conducting courses, increasing accessibility, and reaching out to an untapped student pool. On the other hand, familiarity of the target population with internet skills and limited options for group activities may be possible disadvantages, particularly in a master's program.¹⁰

In general, a structured master's program is essential to master DPH competencies; it is the foundation of DPH education and practice. Interestingly, the significant odds of having lower DPH competency scores in the younger age group (<30 years) compared to the older age group (≥30 years) across all of the DPH competencies (Table 8) indicate that there is a potential pool of students for a master's program in DPH.

Among the strengths of this survey are its large sample size and high response rate. A limitation of the survey is

that it does not include general practitioners and public health officials outside of KAUFU. However, based on the preliminary results and several recommendations from the participants regarding preferred methods of instruction, as well as certain skills and competencies, we plan to modify the survey and extend the survey to include a larger population across the country.

Conclusion

This needs assessment survey has helped assess the overall opinions on the need for a graduate program in DPH at KAUFU. It is a preliminary step in the formative planning of a well-structured program, which will address the needs and gaps in oral public health in the country, and will inform the development of course content for the master's program.

Acknowledgments

I would like to express my thanks and appreciation to Dr Heba Alkarimi, Dr Mohammad J Alzahrani, and Dr Samar Mashabi for their valuable comments on the questionnaire design and final report. A big salute to all of the dental professionals who participated in the survey and contributed to the DPH program needs assessment.

Disclosure

The author declares no conflicts of interest in this work.

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Supplementary material

Needs Assessment Survey Template

Needs assesment survey

King Abdulaziz University Faculty of Dentistry 2013

Division of Community Dentistry

Department of Preventive Dental Sciences

Competency Assessment Survey

The Faculty of Dentistry at King Abdulaziz University is developing a Master's of Science program in Dental Public health. In order to design a comprehensive program, it is essential to understand the level of dental public health expertise existing in the country and to identify needs and gaps that will further strengthen these skills. The attached needs assessment survey will help us to gather this information. We request that you take some time to share your information, ideas, needs and concerns. All information provided by you will remain confidential. The data from the survey will be analyzed in an aggregate form.

Competencies are defined as follows:

Term	Definition	Purpose
Competencies	An integrated set of knowledge, skills and attitudes that supports successful performance in job position	Describe the expectation of a job performance and for evaluation of the individual

Survey participants

Survey participants are expected to be representative of the stakeholders who will participate and/or benefit from this program. Please insert a check mark (✓) next to the item/items that best describe your current position:

- Dental Faculty
- Public Health Official
- Interns and newly graduated dentists
- Public health dental practitioner
- Private dental practitioner
- Other (please specify)

Instructions for Completing Survey

Please complete each section of the survey. You will begin with information about yourself (name optional), job title, department/division and qualifications). Space is provided on the top of each page for your initials. At the end, we have

provided space for you to write any additional thoughts and concerns that you may have.

Needs assessment survey

NAME: _____ (Optional)

JOB TITLE: _____

DEPARTMENT/DIVISION: _____

INSTITUTION: _____

SEX: _____

AGE GROUP: 20+/30+/40+/50+ _____

QUALIFICATIONS: (Please List All) _____

DATE: __/__/__

Introduction

Dental Public Health is the science and art of preventing and controlling dental diseases and promoting dental health through organized community efforts.

Public health dentists promote oral health by:

- Assessing the oral health needs of the community
- Developing and implementing oral health policy
- Providing programs and services that address oral health issues.

Many dentists work within public health settings to enhance the traditional DPH infrastructure. Many do so without formal public health training. These public health settings include, but are not limited to: city, province and region health departments; correctional facilities; nursing and other long-term care facilities for the elderly and those with various disabilities; school-based health programs; and free and/or volunteer clinics.

The Core Public Health Functions Steering Committee developed the framework for the Essential Services in 1994. This steering committee included representatives from US Public Health Service agencies and other major public health organizations. The Essential Services provide a working definition of public health and a guiding framework for the responsibilities of local public health systems:

1. Monitor health status to identify and solve community health problems.
2. Diagnose and investigate health problems and health hazards in the community.
3. Inform, educate, and empower people about health issues.
4. Mobilize community partnerships and action to identify and solve health problems.
5. Develop policies and plans that support individual and community health efforts.
6. Enforce laws and regulations that protect health and ensure safety.

7. Link people to needed personal health services and assure the provision of health care when otherwise unavailable.
8. Assure competent public and personal health care workforce.
9. Evaluate effectiveness, accessibility, and quality of personal and population-based health services.
10. Research for new insights and innovative solutions to health problems.
11. Based on your experience in the field of dentistry and public health, please answer the following survey questions:

Sr No	Questions	Multiple Choices (Check all that apply)
1.	Before this survey, did you know what dental public health is?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused to answer
2.	You will prefer to gain knowledge and skills of dental public health through:	<input type="checkbox"/> Master's degree program <input type="checkbox"/> Certificate program <input type="checkbox"/> Workshop <input type="checkbox"/> Seminar series <input type="checkbox"/> Don't know <input type="checkbox"/> Refused to answer <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD
3.	Overall, it is necessary to offer a master's degree in dental public health in the school of dentistry at King Abdulaziz University	<input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD
4.	As a course instructor, what kind of materials / strategies would you use to support your teaching?	<input type="checkbox"/> Textbook <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Instructor Slides (Content) <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Collection of Examples <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Workbook of Homework Problems <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Solution Guide to Homework Problems <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Database of Test Questions <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> List of Discussion Topics <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Exclusively Face-to-Face Classroom Activities <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Emphasize Face-to-Face Classroom Activities with Online Readings and Assignments <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Half Online Activities and Half Classroom Activities <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Emphasize Online Activities with Classroom Meetings <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Entirely Online (Class Never Meets Face-to-Face) <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD
5.	If a master's level course for dental public health is developed, what would be the optimal delivery method for graduate courses	<input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD
6.	The prerequisite knowledge a student should have before being admitted to a master's program in dental public health	<input type="checkbox"/> Bachelor's degree in Dental Surgery <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Dental Hygienist <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Master's in Public Health (MPH) <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Bachelors' in Medicine and Surgery (MBBS) <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Any bachelor's degree <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD
7.	In your opinion, a master's program in dental public health will have an impact on:	<input type="checkbox"/> Promotion of oral health <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Delivery of oral health care services <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Prevalence of oral diseases in the Kingdom <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Research in the field of dental public health <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD <input type="checkbox"/> Oral health care policy decisions <input type="checkbox"/> SA <input type="checkbox"/> A <input type="checkbox"/> D <input type="checkbox"/> SD
Of the following, rank the list of skills, knowledge, or abilities most needed by dental public health practitioners		
8.	Knowledge of clinical dentistry and public health	<input type="checkbox"/> Very Important <input type="checkbox"/> Important <input type="checkbox"/> Moderately Important <input type="checkbox"/> Of Little Importance <input type="checkbox"/> Unimportant
9.	Leadership abilities; Communication skills; and both oral and written Interpersonal skills	<input type="checkbox"/> Very Important <input type="checkbox"/> Important <input type="checkbox"/> Moderately Important <input type="checkbox"/> Of Little Importance <input type="checkbox"/> Unimportant

- | | | |
|-----|---|---|
| 10. | Ability to work effectively with a multidisciplinary team | <input type="checkbox"/> Very Important
<input type="checkbox"/> Important
<input type="checkbox"/> Moderately Important
<input type="checkbox"/> Of Little Importance
<input type="checkbox"/> Unimportant |
| 11. | Coalition and constituency building; Advocacy skills | <input type="checkbox"/> Very Important
<input type="checkbox"/> Important
<input type="checkbox"/> Moderately Important
<input type="checkbox"/> Of Little Importance
<input type="checkbox"/> Unimportant |
| 12. | Negotiation abilities; Political savvy; Problem solving; Computers, technology, and informatics; Marketing | <input type="checkbox"/> Very Important
<input type="checkbox"/> Important
<input type="checkbox"/> Moderately Important
<input type="checkbox"/> Of Little Importance
<input type="checkbox"/> Unimportant |
| 13. | Use of media in health promotion; Research skills; Administrative skills; Assessment, policy development, and assurance | <input type="checkbox"/> Very Important
<input type="checkbox"/> Important
<input type="checkbox"/> Moderately Important
<input type="checkbox"/> Of Little Importance
<input type="checkbox"/> Unimportant |
| 14. | Health delivery systems; Financing mechanisms; Evidence-based dentistry; Grantsmanship; Fundraising | <input type="checkbox"/> Very Important
<input type="checkbox"/> Important
<input type="checkbox"/> Moderately Important
<input type="checkbox"/> Of Little Importance
<input type="checkbox"/> Unimportant |
| 15. | Ethics | <input type="checkbox"/> Very Important
<input type="checkbox"/> Important
<input type="checkbox"/> Moderately Important
<input type="checkbox"/> Of Little Importance
<input type="checkbox"/> Unimportant |

Please use the *Self-assessment rating scale* and *Ranking* below in answering the following questions:

- Self-assessment rating scale (1–6) has been validated and used extensively by Gail Ghore and colleagues (2006) in a ‘program evaluator competencies self-assessment tool’ as part of professional development sessions, graduate-level seminars, and introductory program evaluation courses.

Entry/Novice		Proficient/Skilled		Mastery/Expert	
1	2	3	4	5	6
• Developing awareness/building knowledge		• Applying knowledge routinely		• Using knowledge fluently and effectively	
• Limited repertoire		• Basic repertoire		• Advanced repertoire	
• Limited experience		• Moderate amount of experience		• Extensive experience	
• Unaware of potential problems		• Solves problems as they arise		• Anticipates problems before they arise	
• Unaware of questions to ask		• Aware of questions to ask and able to access resources to answer the questions		• Poses questions to the field	
				• Sought out for input	

- Ranking the importance of competency for the training curriculum
 - Very Important
 - Important
 - Moderately Important
 - Of Little Importance
 - Unimportant

The following is the list of Dental Public Health Competencies. Please assess your own level of competency for each of the following and rate how each competency is important for your work. Your input is very valuable.

No	Dental Public Health Competencies	Self-assessment of your competency level (1= Entry level 6 = Expert)						Rate how important this competency is for your work (A= Very important..... E Unimportant)					
		1	2	3	4	5	6	A	B	C	D	E	
1.	Plan oral health programs for populations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Select interventions and strategies for the prevention and control of oral diseases and promotion of oral health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Develop resources, implement, and manage oral health programs for populations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Incorporate ethical standards in oral health programs and activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Evaluate and monitor dental care delivery systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Design and understand the use of surveillance systems to monitor oral health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Communicate and collaborate with groups and individuals on oral health issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Advocate for, implement, and evaluate public health policy, legislation, and regulations to protect and promote the public's oral health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Critique and synthesize scientific literature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Design and conduct population-based studies to answer oral and public health questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please indicate any additional comments on specific skills/competencies that are necessary but were deficient or missing from the table above.

Thank you for your time.

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