

Perception of Dental Public Health Competency among recent graduates

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Abstract

Aims and Objectives: This study aimed to assess how competent the recent dental graduates perceive themselves to be in Dental Public Health. **Materials and Methods:** A 21-item structured, close-ended questionnaire study was carried out at the KLEVK Institute of Dental Sciences, Belgaum, India. Students assessed their competencies using a three-point ordinal scale. One hundred and thirty-three students were asked to rate their proficiency on a 21-item matrix of the dental public health program. The responses were grouped using the Likert-type scale. Frequencies descriptive data were generated, and statistical analysis of examined variables was carried out using the Chi-square test. Mann-Whitney test was conducted to identify the correlation between variables. **Results:** The overall mean score was 22.61 ± 10.94 , highlighting confidence of the graduates in managing the oral health problems at the community level. Females showed higher competencies in functions related “to develop activities to motivate the community development,” “to motivate health and oral health through health education,” and “to motivate health and oral health through the creation of healthy settings.” While males reported greater competency for the function “to adjust the dental practice to situations of restrictions that limits it.” **Conclusion:** Recent dental graduates at the Institute perceived themselves competent in managing oral and dental health problems at the public level. Additional countrywide evidence regarding teaching and learning of public health dentistry is essential to compare the current experiences of dental graduates and ultimately enhance patient care.

Key words: Competency, dental public health, graduates, perception

INTRODUCTION

A professional can excel in any field if he is adequately competent. Competency is defined as the essential ability to perform a procedure safely and successfully without supervision. For a qualified dentist, competency is the summary of knowledge, attitude, professionalism, critical thinking and problem-solving skills, ethical values, and technical and procedural skills.^[1]

The Universidad Peruana Cayetano Heredi, Faculty of Stomatology (Lima, Peru) was the first to address the issues of competencies. An exercise to evaluate the content and structure of its curriculum by assessment of the dental practice of their students was carried out.^[2] As a result, a new term called “competency-based dental curricula” was developed and then distributed internationally to the educational and scientific

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world.^[2-5] Given that, a competency in public health dentistry is designed by the interface between the community health care requirements and the provided dental treatments. This interaction has impacted the curricular design in a two-mode matrix.^[2-5] To establish competent skills to handle periodontal disease, for example, a disease of oral tissues, student need to perform all related functions regarding diagnosis, promotion, prevention, treatment, rehabilitation, and administration. Conversely, diagnostic features are required for each of the six dental needs. There are twelve competencies in our terminology and ranked second in complexity scale.^[2-5]

Similarly, the competency of public health dentistry has six types of patient care delivered by a qualified dentists to tackle the community needs of oral health care primarily.^[6-8]

Testing the competencies of student's performance is an essential step to ensure safeguarding practices, maintaining accreditation certificates, and ultimately evaluating the curriculum and revising accordingly.^[6-10]

Survey-based questionnaire is a standard method for measuring the competency of freshly qualified dentists to define their apparent expertise in particular areas of dentistry. Several reports examined the self-perceived levels of competency of the dental practitioner. However, the scope of these studies focused on assessing the competency of the practical procedures of the profession rather than addressing the competencies of public health dentistry.^[11-13]

This paper aimed to examine the level of self-perceived proficiency in the dental public health of dentists at the time of their graduation. Specifically, the objectives of this article were:

- To compare the levels of self-perceived competency in public health dentistry among male and female dental graduates
- To grade the various components of self-perceived public health dentistry competency as reported by newly qualified dentists.

MATERIALS AND METHODS

This is a cross-sectional survey-based study which was undertaken in a dental institution in India. All dental interns (133) from the KLEVK Institute of Dental Sciences, Belgaum, India participated in the study. The participants partook voluntarily, and responses were anonymous.

The survey comprised questions in English that is the teaching language of dental colleges in India. It included 21 close-ended randomly ordered items representing the functions and tasks that are crucial to accomplishing competency in public health dentistry. The questionnaire tool was developed using a published questionnaire from a previous study.^[2] The authors (RBG, PB) revisited the questions to adopt the study objectives. Five dental interns working at the KLEVK Institute of Dental Sciences were randomly selected to participate in the pilot study. Slight changes were made to improve the clarity of some questions. The validated questionnaire comprised two pages. The ethical committee of the Institute provided an ethical approval.

All the newly graduates (133) were requested to assemble in a hall on a predetermined day, and questionnaire with an informed consent and brief outline of the research protocol were distributed. A full detail of the study was introduced, and all relevant questions were addressed. All graduates agreed to participate in the study and sufficient time to write their responses was given. No cross-copying was allowed.

Graduates were asked to rate how proficient they perceive themselves on each dental public health function by the using a 3-point Likert scale with 0 indicating "not at all competent," 1 indicating "competent," and 2 indicating "very competent."^[14] The maximum possible score was 42 points. The overall score was then subdivided into three equal-length categories: from 0 to 13 indicating "not at all competent," from 14 to 28 indicating "competent," and from 29 to 42 specifying "very competent." By using the Likert-type scale methodology, the respondents were stratified into three subgroups based on their competency equivalence.^[14]

The various functions were graded in a descending order depending upon the means obtained. The responses were segregated using the Likert-type scale. Descriptive frequencies were obtained, and the variables were statistically analyzed by using Chi-square test. Mann-Whitney test was then carried out to demonstrate the correlation between variables. *P* value of < 0.05 was considered to be significant.

RESULTS

Female respondents (61.7%) were greater than males (38.3%). Scores for various public health functions are presented in Table 1. Scores for the tasks

Table 1: The perception's scores of participants on the assessed public health functions

Tasks (functions)	No.	Very Competent		Competent		Not Competent		Mean	SD	P Value
		%	No.	%	No.	No.	%			
1 “To motivate health and oral health through health education”	Male	10	19.6	41	80.4	0	0	1.20	0.40	0.00
	Female	54	65.9	28	34.1	0	0	1.66	0.48	
	Total	64	48.1	69	51.9	0	0	1.48	0.50	
2 “To augment the oral health diagnosis of a community”	Male	18	35.3	33	64.7	0	0	1.35	0.45	0.30
	Female	22	26.8	60	73.2	0	0	1.27	0.46	
	Total	40	30.1	93	69.9	0	0	1.30	0.46	
3 “To motivate health and oral health through creation of healthy settings”	Male	2	3.9	46	90.2	3	5.9	0.98	0.32	0.00
	Female	41	50	39	47.6	2	2.4	1.48	0.55	
	Total	43	32.3	85	63.9	5	3.8	1.29	0.53	
4 “To motivate health and oral health through training of community agents”	Male	11	21.6	33	64.7	7	13.7	1.08	0.60	0.006
	Female	37	45.1	39	47.6	6	7.3	1.38	0.62	
	Total	48	36.1	72	54.1	13	9.8	1.26	0.63	
5 “To apply basic maintenance to dental equipment and instruments”	Male	27	32.9	45	54.9	10	12.2	1.18	0.39	0.55
	Female	36	27.1	87	65.4	10	7.5	1.21	0.64	
	Total	9	17.6	42	82.4	0	0	1.20	0.56	
6 “To manage the dental practice at private and public area”	Male	4	36.6	44	56.1	3	7.3	1.02	0.38	0.002
	Female	30	7.8	46	86.3	6	5.9	1.29	0.60	
	Total	34	25.6	90	67.7	9	6.8	1.19	0.54	
7 “To interact with other health professionals for satisfying community health needs”	Male	10	19.6	40	78.4	1	2	1.18	0.43	0.87
	Female	21	25.6	52	65.4	9	11	1.15	0.59	
	Total	31	23.3	92	69.2	10	7.5	1.16	0.53	
8 “To incorporate the dental practice into your personal and community development”	Male	9	17.6	41	80.4	1	2	1.16	0.42	0.981
	Female	20	24.4	54	65.9	8	9.8	1.15	0.57	
	Total	29	21.8	95	71.4	9	6.8	1.15	0.52	
9 “To integrate into the public health system”	Male	8	15.7	40	78.4	3	5.9	1.10	0.46	0.321
	Female	23	28.0	51	62.2	8	9.8	1.18	0.59	
	Total	31	23.3	91	68.4	11	8.3	1.15	0.54	
10 “To design, develop and evaluate community preventive interventions”	Male	4	7.8	42	82.4	5	9.8	0.98	0.42	0.04
	Female	26	31.7	50	61.0	6	7.3	1.24	0.58	
	Total	30	22.6	92	69.2	11	8.3	1.14	0.54	
11 “To develop activities to motivate the community development”	Male	3	5.9	28	54.9	20	39.2	0.67	0.59	0.00
	Female	43	52.4	32	39	7	8.5	1.44	0.65	
	Total	46	34.6	60	45.1	27	20.3	1.14	0.73	
12 “To adjust the dental practice to the existing laws and regulations”	Male	8	15.7	41	80.4	2	3.9	1.12	0.43	0.20
	Female	12	14.6	58	70.7	12	14.6	1.00	0.54	
	Total	20	15	99	74.4	14	10.5	1.05	0.50	
13 “To augment the health diagnosis of a community”	Male	16	31.4	24	47.1	11	21.6	1.10	0.73	0.178
	Female	2	2.4	77	93.9	3	3.7	0.99	0.25	
	Total	18	13.5	101	75.9	14	10.5	1.03	0.50	
14 “To contribute to the production and dissemination of scientific knowledge”	Male	0	0	50	98	1	2	0.98	0.14	0.792
	Female	14	17.1	51	62.2	17	20.7	0.96	0.62	
	Total	14	10.5	101	75.9	18	13.5	0.97	0.50	
15 “To integrate into the public health system”	Male	2	3.9	36	70.6	13	25.5	0.78	0.50	0.007
	Female	19	23.2	50	61	13	15.9	1.07	0.62	
	Total	21	15.8	86	64.7	26	19.5	0.96	0.60	
16 “To plan and program delivery of oral health services at community level”	Male	0	0	49	96.1	2	3.9	0.96	0.20	0.466
	Female	1	1.2	74	90.2	7	8.5	0.93	0.30	
	Total	1	0.8	123	92.5	9	6.8	0.94	0.27	
17 “To augment the socio-economic cultural diagnosis of a community”	Male	4	7.8	40	78.4	7	13.7	0.94	0.47	0.746
	Female	0	0	75	91.5	7	8.5	0.91	0.28	
	Total	4	3	115	86.5	14	10.5	0.92	0.36	

Contd...

Table 1: Contd...

Tasks (functions)	No.	Very Competent		Competent		Not Competent		Mean	SD	P Value
		%	No.	%	No.	No.	%			
18 “To design, develop and evaluate community restorative interventions”	Male	0	0	48	94.1	3	5.9	0.94	0.24	0.354
	Female	8	9.8	56	68.3	18	22	0.88	0.55	
	Total	8	6	104	78.2	21	15.8	0.90	0.56	
19 “To manage health care systems to groups”	Male	0	0	41	80.4	10	19.6	0.80	0.50	0.159
	Female	2	2.4	70	85.4	10	12.2	0.90	0.37	
	Total	2	1.5	111	83.5	20	15.0	0.86	0.39	
20 “To adjust the dental practice to situations of restriction that limits it”	Male	8	15.7	36	70.6	7	13.7	1.02	0.55	0.00
	Female	5	6.1	42	51.2	35	42.7	0.63	0.60	
	Total	13	9.8	78	58.6	42	31.6	0.78	0.61	
21 “To participate in the epidemiological surveillance system”	Male	0	0	41	80.4	10	19.6	0.80	0.40	0.184
	Female	9	11	40	48.8	33	40.2	0.71	0.66	
	Total	9	6.8	81	60.9	43	32.3	0.74	0.57	

concerning “to motivate health and oral health through health education,” “to develop activities to motivate the community development,” “to motivate health and oral health through training of community agents,” “to motivate health and oral health through creation of healthy settings,” and “to design, develop and evaluate community preventive interventions” were significantly lower in males than in females ($P = 0.00$, 0.00 , 0.006 , 0.00 , 0.002 , respectively) while the male students reported greater competency for the function “to adjust the dental practice to situations of restriction that limits it” ($P = 0.00$).

The sum and mean scores of the 21 items have been calculated to give a total rating, which was 22.61 ± 10.94 indicating that the fresh alumni sensed themselves to be capable of handling the community needs of oral health. Based on the findings mentioned above, dental tasks were ranked in ascending order from the lowest to highest scores. The four lowest scores were for the tasks “to augment the socio-economic-cultural diagnosis of a community,” “to design, develop and evaluate community restorative interventions,” “to manage health care systems to groups,” and “to adjust the dental practice to situations of restriction that limits it,” whereas the four top marks were achieved for the services regarding “to motivate health and oral health through health education” “to augment the oral health diagnosis of a community,” “to motivate health and oral health through creation of healthy settings,” and “to motivate health and oral health through training of community agents.”

DISCUSSION

The model of community-based dental education is a learning process derived from simulating real-time experience by giving the students the prospect of

training in the community setting.^[4] By doing this, students will learn through community exposure, a wider vision regarding the various social, economic, and cultural elements of the dental and oral health workload that influence the provision of this service on a community scale.^[15] Integrating the students into community practices empowered them with additional clinical and professional skills to a better understanding of their patients within varied social contexts and settings than they usually get in a traditional dental school clinical encounter.^[15]

In India, the subject of public health dentistry is taught in the third or final year of undergraduate curriculum with the allotment of 40–60 hours of theoretical and 150 hours of practical coaching. This research aimed to assess the competency grade of the KLEVK Institute of Dental Sciences graduates (a premiere dental institute in the state with a well-established department of public health dentistry) perceive themselves to be for solving oral health needs in the community.

This paper, to the best of our knowledge, is the first study in India for measuring the self-perception of dental public health competency in a cohort of new dental graduates.

Dental education is a continuous cycle and starts at dental schools; students should progress from the beginner stage through the novice stage to the competent stage by the time they graduate.^[8] This research focused on specific competency items. It is important, therefore, to comprehend the assessed competencies as an integral process rather than individual items. There are five stages of clinical competencies according to a study by Benner.^[16] For

example, a student at the dental college could have the competency of performing a restorative procedure technically. However, he or she lacks the skills to apply this method in a clinical setting and has limited professional responsibilities associated with this practice. The student would, therefore, be considered as a novice.^[1]

The advanced beginner level is achieved based on considerable experience and being mentored by a supervisor. The competent dentist clinically starts to set goals or plans based on hierarchical procedure for making decisions. However, they still experience slow speed as they do not have sufficient experience. The undergraduate dental program requires satisfactory accomplishment at this level. Proficient dentists comprehend a condition as a whole because they recognize its meaning with regards to long-term objectives. Finally, an expert acts from a profound understanding of the entire situation utilizing the large background of experience and highly skilled analytic ability for occasions with no previous experience.^[1]

Final examinations, clinical case presentations, and supervisor evaluations, in addition to satisfaction survey of patients, students, and alumni are examples of the applied methods to assess the efficiency of a dental curriculum.^[1] In this study, a questionnaire was used to assess the level of competency which is a reasonable standard to measure the efficacy of dental curriculum.

The self-administered questionnaire is a widely used methodology to assess the self-perceived dental competencies; however, the risk of bias cannot be excluded in this type of studies. Several reports highlighted that students' feedback might be affected by the passionate obligation and appreciation to their college for receiving their professional qualification.^[10,17-19]

Our findings indicate that fresh dental graduates assumed themselves competent in resolving the community level oral health needs. However, they ranked themselves as more experienced in carrying out specific tasks of public health dentistry. For example, promoting general and oral health through health education scored the highest in self-perception. This finding is consistent with the results from the study conducted among dental graduates at the Universidad Peruana Cayetano Heredia, Faculty of Stomatology.^[2] It could be due to the design of undergraduate training program that includes oral health education aids (poster, model), tobacco counselling, and school health education programs. Tasks such as *"to augment the oral*

health diagnosis of a community," "to motivate health and oral health through creation of healthy settings," "to motivate health and oral health through training of community agents," "to apply basic maintenance to dental equipment and instruments," also were scored highly; this could be due to the fact that the learning experiences of public health dentistry weighted higher on these activities with a thorough coaching in recording the major indices of oral diseases.^[1,18]

The functions with the lowest scores were *"to augment the socio-economic-cultural diagnosis of a community," "to design, develop and evaluate community restorative interventions," "to manage health care systems to groups," "to adjust the dental practice to situations of restriction that limits it,"* and *"to participate in the epidemiological surveillance system."* These results were similar to that found in Rafeek *et al.* study.^[1]

Special consideration should be given to these lower score functions when planning of curricular changes in dental education is determined. The approaches of reflective teaching have been proven to be valuable tools to improve the impact of the community learning experiences.^[12,17] There are several approaches and tools that have shown capability in enhancing the dental education on the basis of community-based learning experiences such as *"photographic documentation, written narratives, critical incident reports, and mentored post-experiential small group discussions, in addition to fieldwork."*^[12]

The male brain is characterized by systemizing tendencies (to use Baron-Cohen's term) and mechanistic thinking (to use Crespi and Badcock's term). *"Systemizing"* is the motivation to analyze, explore, and construct a system. In contrast, the female brain is characterized by empathizing tendencies (to use Baron-Cohen's term) or mentalistic thinking (to use Crespi and Badcock's term). *"Empathizing"* is the ambition to identify another person's emotions and thoughts and to respond to them with an appropriate emotion.^[2] This study aimed to understand another person, to predict his or her behavior, and to connect or reverberate with him/her emotionally. In our study, males reported greater competency for the function *"to adjust the dental practice to situations of restriction that limits it."* While the females reported greater competency for the tasks concerning *"to develop activities to motivate the community development," "to motivate health and oral health through health education,"* and *"to motivate health and oral health through the creation of healthy settings."* This is in conjunction with male and female gender stereotypes.^[2]

Limitations

Competency-based surveys yield useful information for curriculum review, however, neither they nor any single method of reviewing the curriculum should be used alone. Advances in educational and dental research and the changing dental needs of the population should be factored into the curriculum alongside information from traditional sources such as internal surveys and accreditation reviews. Blunt tools such as competency-based evaluations should be clarified and amplified by focus group interviews to tease out the precise reason for perceived lack of competence in any particular area.^[6] More interestingly, implementing the e-learning assessment has proved to provide a fair evaluation of specific learning domains such as dental public health.^[20]

CONCLUSION

There is a need for additional countrywide data regarding public health dentistry education to enable propagation, exchange, and evaluation of knowledge and skills. Thus, this study is an initial attempt that should be taken further on a larger scale to determine the overall dental public health curriculum competencies.

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Conflicts of interest

There are no conflicts of interest.

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