

Self-Perceived Dental Public Health Competencies of Dental Graduates: A Comparison of Traditional and Modified Curricula in Karachi

Shaur Sarfaraz¹, Muhammad Kashif Nisar², Zohaib Khurshid³, Batool Sajjad⁴, Muhammad Shahid Shamim⁵

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ABSTRACT

Objective: To compare self-perceived dental public health competence in fresh dental graduates, learning through traditional and modified dental curricula in private dental colleges of Karachi.

Materials and Methods: A cross-sectional study with a self-administered questionnaire (21 items) on a 3-point Likert scale was conducted with dental graduates of four private dental colleges in Karachi. Data were analyzed using SPSS version 23. Mean and SD were reported for age and self-perceived competency scale items were analyzed by applying an independent t-test.

Results: 255 participants completed the survey (response rate=88.5%) with a mean age of 24.02±0.832 (male 24% & female 76%) ranging from 22 to 26 years. The graduates were of almost equal number from both the groups (T=51%, M=49%). Graduates who learnt public health from a traditional curriculum had a higher perception of their competence compared to the modified curriculum group with a significant *p*-value=0.04.

Conclusion: This study identified that overall fresh dental graduates perceived themselves competent enough to deal with dental public health issues. Moreover, dental graduates who studied from the traditional curriculum perceived themselves as more competent in most aspects of dental public health competency than those who learned from the modified curriculum.

Keywords: Competencies, Curriculum, Dental Graduates, Dental Public Health, Self-perception

¹Assistant Professor and Director, Department of Medical Education, Altamash Institute of Dental Medicine, Karachi, Pakistan

²Professor and Head, Department of Biochemistry, Liaquat National Hospital Medical College, Karachi, Pakistan

³Department of Prosthodontics and Dental Implantology, College of Dentistry, King Faisal University, Al-Ahsa, Saudi Arabia

⁴Assistant Professor, Department of Oral Surgery, Altamash Institute of Dental Medicine, Karachi, Pakistan

⁵Director, Graduate Studies and Professor of Surgery, Aga Khan University, Karachi, Pakistan

Corresponding author:

Shaur Sarfaraz, Department of Medical Education, Altamash Institute of Dental Medicine, Karachi, Pakistan.
Email: dit.drshaur@gmail.com

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INTRODUCTION

Dental Public Health (DPH) is an essential component of dental graduate programs worldwide and is considered one of the nine recognised specialities of

Dentistry.^{1,2} The dental graduates are expected to have a high level of confidence, inspirational qualities and skills in dealing with public health issues to improve overall dental health and be able to face the challenges

of the changing needs of society. These challenges can be more demanding in developing countries like Pakistan, where a consistent decrease is noted in the Human Development Index (HDI),³ due to rapid population growth and a shortage of health workers, including dental health professionals.⁴ In addition, there is a severe dearth of evidence from this part of the world on the current status of graduates' competence to deal with public health issues.

The above situation of under-developed public health services to the community can be alleviated by empowering the graduates with appropriate training to use technology,⁵ and increase awareness, knowledge and skills to provide effective oral healthcare at an affordable price. Therefore, the undergraduate dentistry curriculum must be taught in a way that encourages students' abilities to deal boldly with concerns of public health and meet the requirements of the community. However, the dental education system implemented in most institutes and universities in Pakistan follows a traditional teacher-centred approach where most of the content is delivered through didactic lectures. This approach is not considered ideal for students' capacity building and skills development especially when it comes to dental public health functions.^{6,7} Therefore, the centre of attention of some of the dental institutes, shifted to developing an innovative dental curriculum to obtain desired learning outcomes which was based on a student-centred approach where undergraduates experience self-directed and active learning approaches for future practices.⁶ These institutes, although use a similar curriculum for teaching public health or community dentistry in year three of a four-year Bachelor of Dental Surgery (BDS) program, incorporating active learning, small-group discussions and self-directed learning, known to enhance deep learning. However, it remains uncertain whether these approaches have been part of curriculum delivery and whether they have any visible impact on BDS program outcomes as no evaluation conducted thus far.⁷

One indicator of students' knowledge and abilities in the field may be their perceptions of their competency in public health dentistry which is not much evident in the literature locally so far. Thereby, providing an opportunity to identify gaps in the current curriculum for undergraduate BDS programs. This initiative could potentially lead to a deliberate modification to the nation's present dental public health curriculum,

identifying competencies that dental graduates' lack, and help in achieving required outcomes. This will result in better-skilled dental graduates who could prevent and reduce dental public health problems.⁸

Therefore, this study aims to assess fresh dental graduates' perceptions regarding their competencies in dealing with dental public health functions. The study also investigates possible differences among the perceptions of students graduating from two different systems of curriculum delivery.

MATERIALS AND METHODS

A cross-sectional study was conducted between February and April 2021, in four dental colleges in Karachi, Pakistan. Non-probability, convenience sampling technique was used. The participants included in this study were all recently graduated from dental colleges, starting their house job, and currently doing the house job at recognised dental hospitals in Karachi, Pakistan. The recently graduated, but year-back dental students and students who got supplementary in Community Dentistry were excluded from the study.

The sample size calculation for this study was done by using Open Epi Software (CI:95%) via the website (www.openepi.com) which was 238 with Population size (for finite population correction factor or fpc) (N): 620, Hypothesized % frequency of outcome factor in the population (p): 50 % +/-5, Confidence limits as % of 100 (absolute +/-%)(d): 5% and Design effect (for CS surveys-DEFF): 1.

Ethical approval for the study was obtained from the Institutional Review Board of Dow University of Health Sciences (IRB-1596/DUHS/Approval/2020), Karachi, Pakistan. Permission letters were also taken from all dental colleges included in the data collection. Participants were provided with detailed information regarding the research and written consent was obtained when the questionnaire was distributed to the willing participants.

The instrument used in this study was a validated self-administered, 21-item questionnaire, utilized in several previous studies.⁹⁻¹¹ The questionnaire was in the English language as the graduates' medium of education. The questionnaire was piloted for improvement and sequencing of questions by subject experts. In the questionnaire, the participants were

S.no	Aspects	Functions/Items
1	Recognizing problems related to socioeconomic factors and health in our community	1, 2,3
2	Promotion of oral health and preventing diseases	4, 5 6,7,8 & 9
3	Usage and adaptation of appropriate technical, physical and legal measures	10,15 & 16
4	Interpersonal and administrative skills	11,12,13,14,18,19 & 21
5	Research and surveillance practices in dental public health.	17 & 20

asked to rate how competent they perceive themselves on each dental public health function by using a 3-point Likert-type scale.¹² The 21 items in the questionnaire were subdivided into five aspects on which the respondents were assessed for self-perceived competencies.

Three experts, masters in community dentistry and specialists in the field, reviewed the questionnaire and discussed each item for its appropriateness, language, feasibility, content and face validity.

Pilot testing was performed after the experts validated the questionnaire. Pilot testing aimed to identify items that lack clarity among respondents. The data was collected from 15 individuals not included in the study using the modified version of the questionnaire. After ten days, the data was again collected from the same individuals for further changes, if required. However, no changes were made in the second round of review. Reliability analysis of the questionnaire was conducted on the pilot data of 15 individuals. The Cronbach's alpha was estimated as 88.5% (0.88), which indicated good reliability.

Data were analyzed using SPSS version 23. Mean and SD were reported for age and self-perceived competence scale items. In addition, frequency and percentage were computed for gender and university with descriptive statistics. A comparison of dental

public health competencies scores among graduates learning through two different types of curricula was done using an independent t-test. A *P*-value ≤ 0.05 was taken as statistically significant.

RESULTS

Out of 288 responders (response rate=88.5%), 255 students from four dental colleges in Karachi, Pakistan, were included in the final analysis. The mean age of graduates was 24.02 (± 0.832) years ranging from 22 to 26 years, with a significant female preponderance There was almost equal participation of students graduating from traditional and modified curricula as shown in Figures 1 and 2.

Table 1 shows the mean score with the standard deviation of each function of the self-perceived competency scale of all the fresh dental graduates. The majority of the graduates perceived themselves to be competent in most of the functions according to the means score below. The highest score was reported for item “elaborate common oral health problems in community” and the lowest score for item “Participate in systematic collection analysis and dissemination of data for planning, implementation and evaluation of public health programs.”

Table 2 presents the mean scores of self-perceived dental public health competencies of graduates

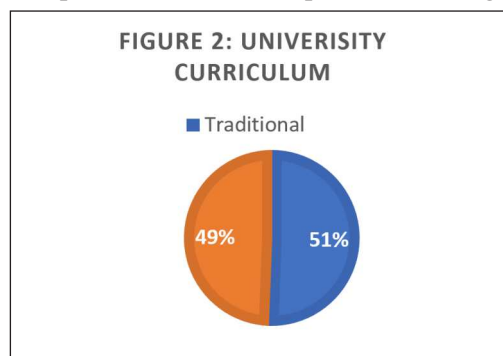
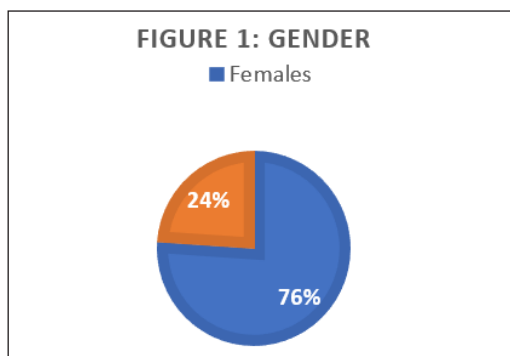


Figure 1 and 2: Baseline Characteristics of Study Variables

Table 1: Descriptive statistics of 21 functions in the self-perceived competency scale

S.no.	Items: Were they able to:	Mean±SD
1	Elaborate social, economic and cultural problems faced by the community.	1.05±0.679
2	Elaborate common health problems in the community.	1.19±0.632
3	Elaborate common oral health problems in the community.	1.32±0.620
4	Develop awareness programs regarding physical & oral health problems for the community.	1.17±0.675
5	Promote health & oral health education through counselling skills.	1.27±0.711
6	Train community agents to spread basic health and oral health awareness.	1.05±0.746
7	Promote health & oral health by creating quality dental health facilities.	0.98±0.715
8	Design, develop and evaluate community preventive interventions.	0.96±0.714
9	Design, develop and evaluate community restorative interventions.	0.95±0.733
10	Apply basic maintenance to dental equipment and instruments.	1.03±0.617
11	Plan and program delivery of oral health services at the community level.	0.97±0.729
12	Manage health care systems with different health professions working in groups?	1.01±0.701
13	Manage the quality dental practice in the private and public sectors.	0.97±0.731
14	Use your knowledge and skills to get incorporated into the public health system	1.16±0.653
15	Use appropriate technologies and ergonomics in dental practice.	0.88±0.700
16	Adjust the dental practice to the existing laws and regulations.	1.04±0.660
17	Participate in systematic collection analysis and dissemination of data for planning, implementation and evaluation of public health programs.	0.85±0.665
18	Deal with different challenges during dental practices like medical emergencies?	1.12±0.662
19	Interact with other health professionals to improve community health needs.	1.03±0.666
20	Contribute to research work (production/dissemination) related to public health	0.96±0.684
21	Incorporate dental practice into your personal and community development.	0.99±0.673

Table 2: Comparison of scores and mean scores of dental public health competencies among graduates learning through two different types of curricula

University Curriculum	Scores	Mean±SD	p-value
Graduates from Traditional	22.99	1.09±7.73	0.041
Graduates from Modified	20.94	0.99±8.15	

comparing two types of curricula, showing slightly higher self-perceived competence scores from the traditional than modified curriculum with a statistically significant value ($p=0.041$).

Table 3 shows the average mean score of items defining each aspect of the scale concerning the self-perception of graduates studied from modified and traditional curricula regarding dental public health competencies. Results showed the mean score of all aspects related to

dental public health was higher for students studied from traditional curricula than modified ones. Some of the items' mean scores of different aspects were also statistically significant.

However, the mean scores of one of the items of the aspect "Oral health promotion and disease prevention"; where the fresh graduates were able to "develop awareness programs regarding physical & oral health problems for the community", were significantly higher

for the modified one than traditional curriculum with statistically significant value ($p=0.046$).

DISCUSSION

This study was conducted to explore the self-perceived dental public health competencies of fresh dental graduates, using a validated 21-item questionnaire, looking at various aspects of dental public health. It provides information about what dental graduates think about their abilities in dental public health, against what

they know about the discipline. It may (or may not) be reflective of the graduates' actual competence.

The study findings interestingly showed that most respondents considered themselves competent in dealing with dental public health issues. This could be due to their limited knowledge about the discipline as the content of the community dentistry curriculum in most undergraduate programs is over-simplified and superficial. For example, the curriculum mainly focuses

Table 3: Comparison of the mean average of each aspect item scores of dental public health competencies among graduates learning through two different types of curricula

Aspects (functions): Were they able to:	Type of Curriculum	Mean±SD	p-value	Mean Average
Recognition of problems in the community				
Elaborate social, economic and cultural problems faced by the community.	Traditional	1.11±0.664	0.203	Traditional 1.23±0.640
	Modified	1.00±0.693		
Elaborate common health problems in the community.	Traditional	1.23±0.644	0.303	Modified 1.14±0.645
	Modified	1.15±0.621		
Elaborate common oral health problems in the community.	Traditional	1.37±0.613	0.188	
	Modified	1.27±0.625		
Oral health promotion and disease prevention				
Develop awareness programs regarding physical & oral health problems for the community.	Traditional	1.09±0.674	0.046*	Traditional 1.07±0.707
	Modified**	1.25±0.669		
Promote health & oral health education through counselling skills.	Traditional	1.22±0.770	0.224	
	Modified	1.33±0.643		
Train community agents to spread basic health and oral health awareness.	Traditional	1.11±0.710	0.184	
	Modified	0.98±0.780		
Promote health & oral health by creating quality dental health facilities.	Traditional	0.91±0.734	0.117	
	Modified	1.05±0.691		
Design, develop and evaluate community preventive interventions.	Traditional**	1.09±0.650	0.005*	Modified 1.05±0.716
	Modified	0.83±0.756		
Design, develop and evaluate community restorative interventions.	Traditional	1.00±0.707	0.262	
Technical, physical and legal measures				
Apply basic maintenance to dental equipment and instruments.	Traditional	1.05±0.623	0.619	Traditional 1.04±0.666
	Modified	1.01±0.613		
Use appropriate technologies and ergonomics in dental practice.	Traditional**	0.98±0.734	0.029*	Modified 0.93±0.648
	Modified	0.79±0.652		
Adjust the dental practice to the existing laws and regulations.	Traditional	1.09±0.643	0.263	
	Modified	1.00±0.681		

Interpersonal and Administrative skills				
Plan and program delivery of oral health services at the community level?	Traditional	0.94±0.726	0.554	Traditional 1.08±0.709
	Modified	0.99±0.732		
Manage health care systems with different health professions working in groups?	Traditional**	1.12±0.736	0.005*	
	Modified	0.88±0.652		
Manage the quality dental practice in the private and public sectors.	Traditional	0.98±0.744	0.725	
	Modified	0.94±0.719		
Use your knowledge and skills to get incorporated into the public health system.	Traditional	1.22±0.684	0.164	
	Modified	1.10±0.617		
Deal with different challenges during dental practices like medical emergencies?	Traditional	1.14±0.622	0.527	Modified 0.97±0.665
	Modified	1.09±0.693		
Interact with other health professionals to improve community health needs.	Traditional**	1.13±0.744	0.005*	
	Modified	0.90±0.563		
Incorporate dental practice into your personal and community development.	Traditional	1.05±0.665	0.094	
	Modified	0.91±0.681		
Research and Surveillance				
Participate in systematic collection analysis and dissemination of data for planning, implementation and evaluation of public health programs.	Traditional**	0.95±0.688	0.021*	Traditional 1.02±0.675
	Modified	0.75±0.628		
Contribute to research work (production/dissemination) related to public health.	Traditional**	1.09±0.662	0.002*	Modified 0.78±0.657
	Modified	0.82±0.686		

on theoretical aspects, with a few awareness activities like primary school trips to spread oral health education. Similar findings were reported by Ridhima B Gaunkar with other researchers in 2016 where he reported, that fresh graduates scored 22.61±10.94 indicating themselves to be capable of handling the community needs of oral health., following Eduardo Bernabé with his fellows in 2006 presented that dental graduates felt “very competent” by 32.57±9.91 points, in solving oral health needs at the community level. Moreover, Arzu Pınar Erdem with his colleagues in 2019 reported that the self-perceived competency of graduates in dealing with dental community issues was positively correlated with the total Professional Preventive Knowledge Scale. (r = 0.192; p=0.031) however, their assumptions were based on a lack of in-depth knowledge about the discipline as in the same study 40 % of dental students

also demanded educational and training needs related to some major functions of dental public health dentistry.^{9,11,13.}

The study also compared the self-perceived competence scores for dental graduates from traditional and modified curricula to assess similarities and differences in perceptions. Overall, most graduates scored lowest in items like “systematic collection analysis and dissemination of data for planning, implementation and evaluation of public health programs and dental ergonomics”. The findings showed that graduates who studied with two distinct types of curricula (traditional and modified) had differing perceptions of their abilities. The graduates from a modified curriculum rated themselves as least competent for research and surveillance, then dealing with technical, physical, and legal measures, followed by interpersonal and

administrative skills (ability to manage medical emergencies). These findings were consistent with one of the recent studies conducted in Iran¹², where students were not very competent in “understanding the components and functions of the healthcare system”, “planning” and “oral health research. Moreover, our study results showed a slight but significantly high level of reported self-perceived competence (means 22.99 ± 7.73 vs 20.94 ± 8.15) by the graduates from the traditional curriculum. Similar results were discovered in research conducted in Saudi Arabia, where dental students demonstrated a greater degree of perceived readiness for dental health practices from the standard curriculum than the integrated one.^{15,16} These results may reflect a lack of evaluation in our education system that can monitor harmony and implementation of appropriate teaching strategies and authentic assessment methods which would be practised, It's possible that ways of teaching and learning have been consistent and the process has been changed and made more demanding. Or it may reflect that the graduates from a modified curriculum may have more in-depth knowledge of the discipline, and therefore, they scored their competencies lower. Conversely, the graduates from the traditional curriculum, with shallower knowledge, are more confident in their competencies. However, these inferences could not be supported by evidence, which is mostly equivocal in this area.

Nevertheless, some studies have reported an influence of the institute's location on students' confidence level in their dental public health competencies. A study from Thailand reports graduates having less confidence in public health competencies when studying in the vicinity of Bangkok, where there is a traditional style of teaching compared to institutions located outside Bangkok using modern teaching methods.¹⁷ Likewise, another published article from Eley DS 2010 suggested that the educational institution's location has a significant impact on dental graduates' confidence levels. It was reported that forty-eight per cent of junior doctors had chosen to spend a portion of their undergraduate training in a rural clinical setting. These differences could be attributed to the community experience of students during their undergraduate years.¹⁸

There could be a variety of other factors that can potentially influence the graduates' competencies (or perception of competencies) in a discipline like dental

public health. These may include the type and implementation of curriculum, faculty's ability to deliver, assessment methods used, educational environment and setting¹⁸, to name a few. In one of the recent studies, it has been observed that well-developed countries are rigorously evaluating their dental public health curricula taking guidance from different current standards and trying to enhance competence in dental public health of dental graduates.¹⁹

The data was collected from different dental colleges in Karachi that shared a similar curriculum affiliated with the same university. Although the inferences from this study may be generalized to graduates from other institutes with the same curriculum type, they may not be reflective of the rest of the country. The study is on self-perceived competency scores which may not assure real competence.²⁰ However, because we lack objectivity and standardization in the tests of competency regarding essential core items and domains of dental public health, self-perceived competency surveys may give an acceptable level of utility.^{21,22}

Nevertheless, despite these limitations, this study provides valuable baseline information on the self-perceived competence regarding functions of public health dentistry among fresh dental graduates specifically as there was a dearth of literature locally. Recently a study reported the preparedness of Dental graduates by Mohammad Qasim Javed and colleagues where he identified shortcomings in multiple soft skills and clinical attributes among dental students and recent graduates in Pakistani dental institutions.²³ The findings shed light on both the strengths and areas demanding improvement among these individuals but not specific to public health dentistry which is getting insufficient emphasis.

The study provides valuable information to initiate the review process for existing dental public health curriculum in Pakistan as done by other countries like USA²⁴ to identify gaps in present content and its implementation, embedding core skills aligning with appropriate teaching and authentic assessment required to build a competent dental graduate to deal with overlooked aspects of dental public health.²⁵

CONCLUSION

The study identified that dental graduates perceive themselves as competent to deal with dental public

health issues, however, the overwhelming perceptions are not consistent with the conditions of dental public health in Pakistan. Therefore, the authors recommend that educationists should focus on identifying the competencies required to produce competent dentists to serve the community and ensure that those competencies are incorporated into the undergraduate dental curriculum effectively to improve public health dentistry in Pakistan.

DISCLAIMER

None.

CONFLICT OF INTEREST

None to declare.

ETHICAL STATEMENT

The ethical approval is provided by the Institutional Review Board of Dow University of Health Sciences (Ref: IRB-1596/DUHS/Approval/2020).

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AUTHORS CONTRIBUTION

Conception and design of the study: S. Sarfaraz, M.S. Shamim

Acquisition of data: S. Sarfaraz

Analysis and interpretation of data: M.K. Nisar

Drafting of the manuscript: Z. Khurshid, S. Sarfaraz, M.S. Shamim

Critical review of the manuscript: B. Sajjad, M.S. Shamim

Approval of the final version of the manuscript to be published: S. Sarfaraz, M.K. Nisar, Z. Khurshid, B. Sajjad, M.S. Shamim

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