

Developing an innovative clinical governance assessment framework for dental schools in Iran

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Objectives The aim of this study was to develop and validate a dental clinical governance (DCG) assessment framework for use in local dental schools in Iran.

Methods A mixed method (qualitative and quantitative) was used in the present investigation. The study was performed in three steps, including: (a) thorough literature review, (b) focused group discussion, and (c) application of validated instrument. The content validity index (CVI) and content validity ratio (CVR) were calculated for each question. The Cronbach's alpha coefficient was calculated to evaluate the internal consistency and reliability for this questionnaire. The Smart PLS software was used for calculation of goodness-of-fit (GOF) for confirmatory factorial analysis to determine construct validity of this questionnaire.

Results Initially, 140 items covering 7 DCG domains were identified after comprehensive literature review. Ten specialists participated in the expert panel, rating independently on the necessity, relevancy, simplicity, and clarity of each question. Expert's ratings were used to calculate the validity for each question. The questions with CVI lower than 0.79 and the CVR less than 0.62 were excluded. Reliability analysis was conducted by calculating intraclass coefficient and Cronbach's alpha coefficient which were 0.88 and 0.92, respectively. This shows good reliability and internal consistency of the questionnaire. Construct validity determined by computing GOF index. The result was 0.622, which indicates a good level of construct validity. After validation process, 124 out of 140 questions left to cover the 7 domains of DCG in our newly developed and validated framework.

Conclusions The newly developed and standardized DCG framework can be used for assessment of compliance level among Iranian dental schools at the national level.

Key words dental clinical governance, dental schools, validation, questionnaire, framework

Introduction

The delivery of quality dental care is a key to the long-term success in oral health promotion. Improving the quality of health care services has been a key priority for successful governments.¹ Clinical governance has so far become an important aspect of quality assurance (QA) and it was first introduced in 1997 with the publication of the "New Labors first White paper on health" as a labor's new approach in Public Health in the 21st century. The concerns were quality care being delivered to the right patient at right time in a right manner.² In relation to QA, there are several models available in public health. All models including: International Standardization Organization (9000, 9001-9004), Dental Excellence quality model of European Federation for Quality Management, total quality management, European Practice Assessment model, as well as the clinical governance³ are aiming at improving the quality of health care services. Clinical governance would build on (not replace) the existing patterns of QA.² By definition, clinical governance is "a framework through which dental practitioners are held responsible to improve quality of their services and establish high standards of care by creating an environment in which excellence in clinical care will flourish." This definition has been produced and applied by NHS clinical governance body, published by the Department of Health in 1997, for general dental practitioners.⁴

The clinical governance approach in UK was originally based on seven pillars (N.H.S approach) including: (1) Clinical effectiveness, (2) clinical audit, (3) risk management (RM), (4) patient safety, (5) patient and public involvement, (6) use of

information, and (7) education and training.⁵ The clinical governance therefore, covers all activities that help maintaining and promoting patient care standards, and never negates other quality management systems.⁶

Background

Compliant dental schools can train fully compliant graduates who can use principals and procedures of clinical governance in their daily clinical practice. The University of Texas Health Science Center, Dental Branch at Houston began credentialing clinical faculty in 1997 as part of its QA and RM program. Credentialing is the process of obtaining, verifying, and assessing the qualifications of a health care practitioner who provides patient services in a health care organization.⁷ Hugh Bennet et al, developed a framework for evaluating clinical governance in dental field. This framework included cleanliness and infection control, safety and safeguarding, information and involvement, training and development, quality and improvements, and RM as main domains by focusing on reducing inequities in oral health.⁶ Holden and Moore developed a 14 component model to define structure and process control in order to assure the expected outcome in overall clinical performance. They believe it is a robust, flexible, effective, and systematic way of improvements in QA.⁸ The "Medical Practitioners and Dentists board" in Kenya developed a national training and QA standards for dental schools and teaching hospitals including: governance and management, academic program, physical infrastructure, human resources, student affairs, program monitoring, and evaluation, as well

as research and innovation.⁹ Fredekind et al performed a survey to obtain information on whether dental schools integrated QA and RM and what mechanisms have been most effective in measuring accomplishments in those institutions. All 65 dental schools were sent a 29-item survey, of which 46 (71%) responded. Sixty-six percent of dental schools ($n=43$) had a written QA program supervised by a QA committee.¹⁰ Kakudate et al evaluated the use of Japanese clinical guidelines among 148 dentists in a cross-sectional study. They concluded using clinical guidelines and evidence-based practice is still inadequate in Japanese dentistry, but use of the clinical practice guidelines was significantly related to better clinical experience.¹¹ In current study, the aim was to develop and validate a dental clinical governance (DCG) assessment framework for use in local dental schools in Iran.

Methods

Using descriptive-analytic study design, the investigation was conducted in three steps, including: (a) thorough literature review, (b) semi-structured interview (focused group discussion), and (c) application of validated instrument in selected public dental schools. Please note that for the purpose of this publication steps 1 and 2 are presented and the rest will be reported separately.

Step 1: Comprehensive Review of Literature

A comprehensive review of literature was conducted by search in English electronic databases including: PubMed, Emerald, Science Direct, Google scholar, and also other published books and documents related to clinical governance to obtain different patterns and frameworks related to clinical governance in dental practice in order to identify the main domains of Clinical Governance in dentistry.

Step 2: Focused Group Discussion

The outcome of the first step was formatted into a checklist containing 140 questions regarding clinical governance in dental practice prepared. The checklist was categorized in seven main areas. This checklist was provided to Focus Group participants 2 weeks prior to their meeting. A well-recognized expert (the head of the clinical governance committee at the ministry of health and medical education) was invited as a moderator to manage the focused group discussion. This professional committee was formed with 10 specialists whose qualifications are demonstrated in Table 1. The moderator's goal was to generate the maximum amount of discussion and opinions provided by participants within a given time period.¹² First, the moderator explained the importance of clinical governance in quality of health care services and described seven main components of clinical governance based on NHS system that has been applied for evaluating Iranian medical hospitals since 2009. Discussion on each question was continued and all opinions and comments were written in a board for further explorations and decisions. This session was recorded and reviewed to make sure nothing was missed. Finally, specialists were asked to provide comments independently on the necessity, relevancy, clarity, and simplicity of each question in order to calculate the content validity index (CVI) and content validity ratio (CVR) as well as other analytical procedures for standardization of the questionnaire.

Table 1. Qualifications of focus group participants

#	Specialty/Department	Degree	Academic rank	Total
1	Social medicine	PhD	Assistant Professor	1
2	Endodontics	MSc	Professor	2
3	Oral and maxillofacial surgery	MSc	Assistant Professor	1
4	Operative dentistry	MSc	Associated Professor	1
5	Periodontics	MSc	Professor	1
6	Orthodontics	MSc	Professor	1
7	Dental public health	PhD	Associated Professor	2
8	Biostatistics and epidemiology	PhD	Assistant Professor	1
Total				10

Results

Reliability

Two methods were used for internal consistency and reliability of the newly developed instrument:

- Cronbach's alpha coefficient method was used to assess the internal consistency of a scale which relates to its homogeneity. The calculated value was 0.92 that shows a good internal consistency between questionnaire items.¹⁴
- Intraclass correlation coefficient (ICC) was calculated to determine the reliability of the scale using test-retest method. The test-retest reliability method was used to assess the stability over time, when applying the same test to the same subjects at different points of time.¹⁴ The estimate of ICC coefficient was calculated to determine the reliability of the scale using test-retest method. The ICC score was 0.88 that demonstrate good reproducibility of questionnaire.

Content, Face and Construct Validity

- The expert panel's rating on the necessity, relevancy, simplicity, and clarity of each question was used to calculate the validity for each question. According to Lawshe table, an acceptable CVR value for 10 expert panels was 0.62 and acceptable CVI was 0.79.¹³ Therefore, the questions with CVI lower than 0.79 and the CVR less than 0.62 were excluded.
- The face validity of the questionnaire was assessed by using the impact score (frequency \times importance). The items related with an impact score of equal to or greater than 1.7 was considered appropriate. The mean score for CVI, CVR, and impact score were calculated for each domain and also for the whole questionnaire.
- Construct validity was assessed by confirmatory factorial analysis and computing convergent validity, discriminative validity, and goodness-of-fit (GOF) index by computing, R^2 , t-value, and communality indices. GOF index was 0.622, which indicates a good level of construct validity or good relationship between questionnaire items. The convergent validity was determined for each domain by computing average variance extracted (AVE). For each domain,

Table 2. Components of validity analysis

Domains	Construct validity (Confirmatory factorial analysis)				Content validity		Face validity
	R ²	T-value	Communality	AVE	CVR	CVI	Impact score
Management and leadership	0.520	2.466	0.693	0.711	0.80	0.82	3.75
Clinical audit and effectiveness (prevention)	0.671	25.410	0.756	0.776	0.72	0.95	3.78
Clinical audit and effectiveness (treatment)	0.503	10.938	0.739	0.762	0.82	0.97	3.33
Patient and Public involvement	0.696	28.248	0.775	0.799	0.75	0.91	3.59
Risk management	0.403	9.490	0.603	0.624	0.84	0.95	4.15
Using information	0.417	9.152	0.821	0.850	0.91	0.87	3.34
Staff education	0.552	16.873	0.683	0.706	0.75	0.92	3.64
Mean	0.536	14.65	0.724	0.746	0.80	0.92	3.61
G.O.F	$GOF = \sqrt{R^y * Communality} = \sqrt{0.536 * 0.724} = 0.622$						

AVE was higher than 0.5 which shows good convergent validity. Also, discriminative validity was computed for each question. The results showed that questions in each domain have more correlation with domain topic, compared to other domains. The components of validity and reliability analysis is demonstrated in Tables 2 and 3.

After validation process, 124 out of 140 questions left to cover the 7 domains of DCG in our newly developed and validated framework. A total of seven questions on leadership and management domain, four questions in clinical effectiveness and audit (prevention) domain, four questions in clinical effectiveness and audit (treatment) domain, and one question in RM domain were excluded because their scores were less than the acceptable thresholds.

Fig. 1 shows the validation process. Components of final validated framework and number of questions left in each domain are shown in Table 4. It is important to note that the “clinical effectiveness and audit” domain is originally designated for “treatment.” However, given the importance of “prevention” in dentistry, a separate domain was assigned for its robust independent assessment (numbers 3 and 4 in Table 4).

Table 3. Components of reliability analysis

Domains	Reliability	
	Composite reliability	Cronbach's Alpha
Management and leadership	0.961	0.956
Clinical audit and effectiveness (prevention)	0.980	0.978
Clinical audit and effectiveness (treatment)	0.957	0.947
Patient and Public involvement	0.983	0.981
Risk management	0.981	0.980
Using information	0.992	0.992
Staff education	0.981	0.980
Mean	0.976	0.973

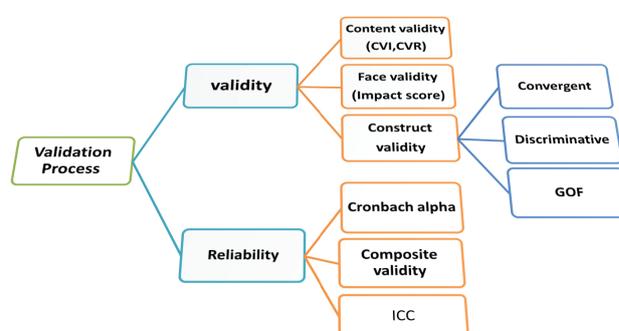


Fig. 1 Framework validation process.

Table 4. Framework components and number of questions in each domain

#	Clinical Governance Domains	Number of Questions
1	Management and leadership	10
2	Clinical effectiveness and audit (prevention)	15
3	Clinical effectiveness and audit (treatment)	8
4	Patient and public involvement	14
5	Risk management	32
6	Using information	23
7	Staff education	22
	Total	124

Discussion

Dental schools are under increased pressure to demonstrate QA efforts in their clinical practice. QA in any health care institution should meet the acceptable standards of patient safety with highest priority.¹⁰ However, the main goal of dental education is to: (a) fulfil the above requirement, (b) train competent dentists who are fully compliant with DCG, and (c) achieve oral health promotion in the public, without forgetting

the healthy individuals. Despite all scientific innovations and advancements, oral diseases are still highly prevalent based on epidemiological reports, as well as the ever-increasing socioeconomic and demographic changes that occur in most communities. The prevalence of dental caries among adults population is very high (over 95%) in most countries. Generally, oral diseases are considered as one of the major public health problems in all regions of the world. They involve individuals and communities and diminishing the quality of life by causing pain, infection, and sufferings that leads to impairment of function as well. Based on reported global burden of oral diseases, the condition is mostly concentrated in disadvantaged and poor communities. The current pattern of oral diseases are related to lifestyle and environmental factors, and lack of access to preventive oral health programs.¹⁵

The results of national survey regarding the oral health status in Iran (2018) showed that periodontal diseases and tooth loss are increasing compared with previous data. Caries-free status is sharply declining from 12 to 15 years olds (by 27%) and number of edentulous people is exceeding 50% in our elderly (65–74 years) population. These data indicate the urgent need for effective interventions in all age groups. Lack of supportive oral health promotion policies for allocating appropriate resources was considered as the main reason for the current situation in Iran.¹⁶ Therefore, development of new training standards of care within the DCG framework is crucial to fulfil the population's oral health promotion needs. On the other hand, future accreditation of dental school curriculum and the competencies of their graduates will receive reciprocal recognition at the local, regional, and global levels, if uniform standards of care is provided in harmony with DCG. DCG is dynamic and changing with advancement of science. Therefore, innovative dental schools will incorporate DCG framework in order to be qualified for certificate of compliance. This would also help to reduce high current demands for dental services by incorporating preventive principals, while providing the high quality dental care to incoming patients. The newly developed framework has some similarities with Hugh Bennet's framework that assessed fewer domains on patient's satisfaction and patient's

complaints as an independent domain (patient and public involvement) can be considered as an advantage for this framework as well.⁶ Fredekind et al evaluated dental schools based on QA and RM domains¹⁰ while, the current validated questionnaire focused on all seven domains of clinical governance for evaluating dental schools. The national training and QA standards for dental schools and teaching hospitals developed by the "Medical Practitioners and Dentists board" in Kenya was rather considered as a comprehensive program with measurable standards that can be comparable in some aspects with the newly developed framework, covering both QA and educational needs of students in dental schools and teaching hospitals in Kenya.⁹ Kakudate et al evaluated the use of Japanese clinical guidelines which is related to clinical effectiveness domain¹¹; while the current validated framework can assess all seven main domains of clinical governance in dental schools.

The aim of this study was to develop an innovative framework for assessment of local dental schools in relation to DCG compliance level. The availability of such standardized framework can help all local dental schools to conduct voluntary internal evaluation on their progress in meeting these standards. The Ministry of Health and Medical Education can also set the expected national standards of DCG and use this instrument for external evaluation of dental schools in order to ensure that those academic institutions meet the minimum requirements. To recognize such an important achievement, a compliance certificate may be issued by the Ministry of Health for qualified institutions. This document can play an important role in accreditation of institution as well. Regular internal and external evaluations can safeguard QA in dental services delivery for all individuals, healthy, or otherwise.

Conclusion

The current study was conducted to develop a DCG framework for use in local Iranian dental schools. The newly developed and validated framework can be used for assessment of compliance level among Iranian dental schools at the national level.

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