

Outcome-based Dental Education and Identification of Practice Gaps; A Narrative Review



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Undergraduate dental education aims to provide the society with competent dental graduates that are able to serve in the community as independent practitioners. The rotational clinical training provided in our current dental settings do not fully prepare dental graduate for comprehensive dental care as the focus is more on subject areas rather than as a whole. Outcome-based dental education defines certain outcome-competencies that are essential part of dental curriculum and also provide a roadmap for curriculum developers regarding expectation from a beginner dental graduate. These competencies are based on knowledge, skill and attitudes that a beginner dentist is able to practice professionally and ethically. The review focuses on competence of dental graduates and discusses gaps that have been identified by the dental schools elsewhere that have led to valuable insights regarding readiness for comprehensive dental care in a beginner dentist. This information may direct dental policy makers and curriculum developers to focus their goals towards a dentist who is more trained in comprehensive dental care within undergraduate level or in immediate post-graduation level before exit into the community.

KEY WORDS: Dental, Fresh Graduate, Gap, Practice, Identification, Outcome-based, Education

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INTRODUCTION

The main focus of an undergraduate dental education program is to equip the community with competent dentists who are able to serve societal needs and improve population oral healthcare.¹ Pakistan Medical and Dental Council (PM&DC) is the national regulatory body that establishes minimum standards for education and licensure dentistry, and sets standards for the instructors in medical/dental colleges in Pakistan. In addition to basic medical sciences subjects, the initial two years of Bachelor of Dental Surgery (BDS) in Pakistan are devoted towards teaching of pre-clinical basic dental science subjects, which are followed by clinical component beginning in third year of BDS. At the end of each year, a comprehensive examination is taken for final assessment of the students. A minimum of one-year training in a recognized hospital setting is mandatory for registration of dental graduate as independent dental practitioner.² Majority of the time, this clinical training is based on rotational duties in oral surgery, prosthetic,

periodontology, orthodontics and restorative dentistry.² Although, such rotations enable the beginner dentist to treat one specific dental problem at one given time but restricts the application of a holistic approach for comprehensively treating the dental patient.

Competency-based Dental Education

The type of training approach given to the graduate may depend on the type of the curriculum that is being taught to the students. Majority of curriculum taught in a dental school broadly fall into two main categories, prescriptive and outcome-based.³ In the former category, more focus is placed on teaching with little or no integration between subjects and across disciplines. This type of education is teacher-centered and requires a large volume of factual knowledge and learning of certain taught traits. The universities in Pakistan are following a change to be in line with the global trends and integrating outcome-based curriculum in which goals of the educational experience are clearly defined and also means to achieve those goals are clearly implemented. Thus undergraduate dental education is now evolving from a discipline-focused and largely teacher-centered approach to an out-come based or competency-based education.^{1,4} This type of curriculum is broadly student-centered. It also

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allows vertical and horizontal integration and challenges students for critical thinking.³ As the competency-based education is based on identification of clearly defined learning outcomes, it mainly includes statements of competency, learning experience that supports such competencies and methods for assessment or measuring attainments of these competencies.⁵

The introduction of a competency-based curriculum had started in the United States in 1993 when Chamber proposed that "Competencies are skills essential to begin practice of dentistry and allied dental practice. Competencies combine appropriate supporting knowledge and professional attitudes that are performed reliably in natural settings without assistance".⁶ "Competence" can relate to professional performance or behavior that can include a wide range of

personal attributes and qualities such as habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, perceptiveness, creativity, receptivity, social skills and reflection in daily practice for the benefit of the individual and the community being served. It builds on the foundation of basic clinical skills, scientific knowledge, and moral development and involves cognitive function of acquiring and using knowledge to solve real-life problems.⁷ Competency can be a transition state toward expertise. It can also be defined as behaviors expected of a beginner and independent dental graduate that incorporates understanding, skills and values in an integrated response to the full range of circumstances that may be encountered in a general professional practice.⁸ Competency has been further defined by the working party of Competencies for Dental Licensure in Canada as "Competency is most often used to describe the skills, understanding and professional values of an individual ready for beginning independent dental or allied oral health care practice".⁹

Since then, competency-based dental education is widely accepted in the profession and is believed to improve student's performance with

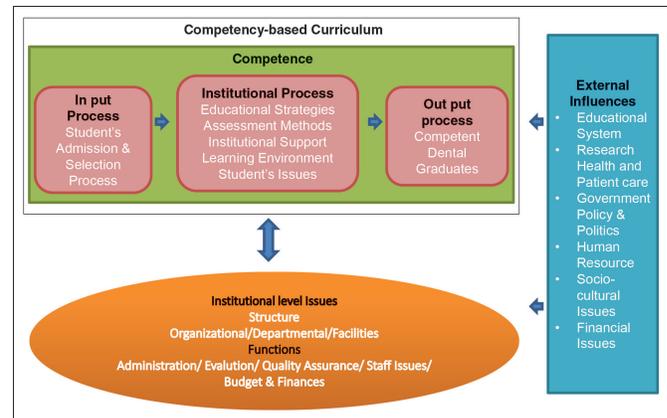


Fig: 01 Relationship between different components of undergraduate dental education (Modified from Chuenjitwongsa et al., 2016).

Competence:

Competence can be the professional performance or behavior that can include a wide range of personal attributes and qualities including knowledge, technical skills, clinical reasoning, values and reflection in daily practice. It builds on the foundation of basic clinical skills, scientific knowledge, and moral development and involves cognitive function of acquiring and using knowledge to solve real-life problems.

Dental competencies:

Skills needed to begin the practice of dentistry and allied dental profession. Competencies combine related knowledge and professional attitudes and are displayed reliably in natural settings without assistance.

Gap Analysis:

Gap analysis involves comparing actual performance with the intended competencies. This can be done through self-assessment, peer assessment or objective testing

Beginner Dental Graduate:

A dentist who is in year one of clinical training after graduation

Comprehensive Dental Care:

Comprehensive dental care refers to in depth holistic dental care and management of a patient that not only involves a careful treatment planning and performing all the required dental procedures to improve oral health but if required, also a cooperation with physician to positively impact the overall health of an individual through treatment of oral disease.

problem-solving, critical-assessment, discipline integration; and progressive autonomous self-assessment.¹⁰ Therefore, competency documents are constantly being developed by the educational experts and are used as framework to guide and encourage the development of curriculum and for assessment of students.¹¹ They are also used in accreditation of a dental programs to ensure that a specific dental program has adequate depth and breadth of opportunities for students to achieve readiness for dental practice.¹² The Association of Canadian Faculties of Dentistry (ACFD) has identified forty-seven competencies that act as a guide for the Canadian dental schools.¹²⁻¹⁴ Can-Meds is often used as framework by many professional bodies to identify the core competencies in their graduates.¹⁵

The process of becoming a competent dental practitioner is not a simple on-going process but follows a continuum from novice to an expert stage depending upon both the individual and attaining mastery of the skill.^{1,6,16} For this reason, the educational principals of any dental school focus on facilitation of their graduate's primary objective which is the integration of their theoretical knowledge into the clinical dental

practice while ensuring that the students have gained essential competencies in providing a holistic quality dental treatment.^{4,17-19} The dental literature has described competency-based dental education relative to pre-clinical and clinical dental practice^{5,20,21} and dental educators have developed these competencies as a framework to prepare and evaluate dental students in technical, diagnostic knowledge, skills and abilities.^{8,22,23}

It is however important to define, instruct and evaluate competency-based education in Pakistan so as to have a safe dental product. Fresh graduates are believed to be "competent" when they are able to function independently in a realistic practice environment.²⁰ There is a difference that exists between perceived performance and the actual performance. The identification of this is the discrepancy or a "gap" analysis in which current behavior is compared with a "set" or an "accepted standard of practice" or intended competences. The exploration of factors or issues that create gap of practice in individual cases can also help identify the reason for such gaps.^{24,25}

It has been suggested that newly graduated students are reluctant to openly admit a lack of confidence in skills that are essential for entry into a clinical dental practice.²⁶ Therefore, it is necessary in for the undergraduate dental education to ensure that new graduated dentists are competent enough to be designated as safe independent practitioners, and are committed to continue to develop their professional knowledge, understanding and skills.¹ Previous published studies highlight the importance of development and validation of a competency system for dental curriculum. The repeated iterations of goals, standard settings, design of experiences and appraisal is essential for transforming dental education institutes into true learning organizations.^{27,28} It has been shown that essential information leading to reforms in dental curriculum has been generated by surveying dentists regarding competencies in skills, knowledge and attitudes of the dental education program.²⁹ Similarly, the University of Texas Health Sciences Center at San Antonio involved their faculty, students, alumni and outside consultants to re-evaluate the competencies of their program to ensure they are contemporary and methods to assess them are valid and reliable.³⁰ Same has been achieved by assessing competencies for dental public health professionals and physical therapy specialists.³¹⁻³³ It has been suggested that faculties of dentistry in Canada use the "competencies of beginner dentists" as a bench mark against which the dental curriculum offerings can be measured more appropriately.¹¹

Need for Competent Dental Graduate in Pakistan

Dental education in Pakistan faces many challenges that may include issues related with the educational

environment, type of curriculum taught and limited research resources.^{34,35} There is a need to revisit the current curriculum design and educational strategies in line with the educational objectives.³⁴ Researchers in Pakistan have proposed certain outcome competencies through brain storming and Delphi technique that (a) Pakistani graduate of dental profession should possess before entering into the community. These include thirty measurable outcomes that have been grouped under two broad categories of "clinical skills" and "professional behaviors".³ These competencies are based on themes including clinical competence, confidence and multidisciplinary approach, role in health service, treatment planning, attitude, ethical stance and legal responsibilities communication skills, information handling and teaching. It was believed that these themes covered all areas of knowledge, skills and attitude, thus the dental graduates are expected to be functional and competent within our community.³⁶ It is very important to be clear about the qualities of our Pakistani dental product (i.e., the dentist); only it can be ensured that the our graduated product is a safe dental practitioner and is able to perform competently as a junior practitioner in our community.³⁶

Identification of Practice Gaps in Dental Education

In order to evaluate the success of any dental education program, it is very important to ensure that the goals of the curriculum are met with the expected standards. For this reason, it is important that stakeholders such as alumni, academic staff, employers and ultimately patients provide a global perceptive regarding the entire curriculum.¹¹ Through such perspectives, it has been found that majority of dental students desire a curriculum that has a focus on developing clinical experience with more time in clinical environment.³⁷ For this reason, it has been suggested that the professional preparedness of the graduating students can reflect the quality of the dental program. The Association of Canadian Faculties of Dentistry (ACFD) competency document has identified forty-seven competencies that guide Canadian dental schools. These competencies were later validated for a beginner dentist through validity surveys involving recent graduates, licensed dentists, examiners and deans of dental schools in Canada.¹³ Recently, studies have been done to analyze the importance of competencies expected from graduated Canadian dentists from a student's perspective in order to identify essential gaps in Canadian dental education.^{12,38}

The Gaps in dental education have been identified from perceptive of various sources such as students, alumni, faculty members, employers and patients. Alumni of the dental school can provide essential information regarding strengths and weaknesses of the curriculum that they have

received. Extensive studies have explored graduated student's perspectives to investigate preparedness of graduating dentists for integration into professional practice. Exploration of student's perception regarding learning environment, knowledge, skills, confidence and practice management skills has generated valuable data regarding their well- or ill-preparedness and also provided a base-line for curriculum restructuring to prepare students before entering into a competitive dental work force.^{12,26,35,39-53} Such data from students also provides insights about graduating dental students and their experiences in dental school can help curriculum developer regarding newer trends in dental education, student's future goals and in comprehensive care curriculum.^{37,53-56} Similarly, assessment from the teachers regarding performance of their students is also a useful tool to evaluate the overall clinical skills expected from the graduated dentists.⁵⁷⁻⁵⁹ Standardized patients have been used to assess communication and clinical skills of the graduates.⁶⁰ Employer's perceptions have also generated important data in assessing clinical competencies of the graduates in a real clinical setting. Such studies have identified low confidence in certain competencies that are expected in dental graduates thus generating valuable information for need of additional or prolong trainings at undergraduate level.⁶¹⁻⁶³ It has been shown that although dental graduates perceived themselves excellent in certain competencies such as treatment planning, community-based skills, administrative and management skills, and professional development skills their employers felt opposite and expressed concern. Thus information generated from such investigation has led to suggestions regarding further reforms in the existing curriculum.⁶³

CONCLUSION

The curriculum developers and policy makers involved in designing and implementing dental curricula across Pakistan need to devise strategies to formulate an outcome-based dental curriculum that clearly guides educational institutes regarding competences expected from beginner Pakistani dentists and should work on gathering data regarding perception of students, alumni, faculty members, clinical trainers, employers and patients regarding quality of our dental graduate working as an independent dental health care professional.

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CONFLICT OF INTEREST

None to declare

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