

Competency Assessment of the Last Year Students of Tabriz Dentistry School in the Major Skills Needed for a New Dentist

Pourabbas R, DDS¹; Amini A, MD²; Milani F, DDS³; Safarnejad S, DDS^{3*}

¹Associate professor, Dental and periodontal research center, Tabriz University of Medical Sciences

²Assistant professor, Education Develop Center, Tabriz university of Medical Sciences

³ Dentists, Tabriz- Iran

Abstract

Background: Assessment of educational courses has a critical impact on quality improvement in all curricula. Surveys aimed at alumni and graduating students may be useful for the evaluation of the program outcomes and revision. The aims of this study were to describe levels of competency of last year students of an Iranian dental school in the major skills needed for a new dentist and to investigate its relationship with background factors such as gender, marriage status, entrance exam score, entrance quotas and their economic status.

Methods: In this cross-sectional descriptive analytic study, 55 last year dental students filled out a valid and reliable questionnaire including demographic characteristics and 132 competencies that could be rated on a four point Likert's Scale. The data were analyzed by one-way ANOVA, independent-samples t-test and Pearson correlation coefficient.

Results: Students' total competencies mean score was 47.48 ± 2.03 out of 100. The lowest and highest score belonged to oral diseases diagnosis (%18.48) and Preventive dentistry (%66.06) respectively. The past dental hygiene students continued their education as a doctoral degree were more competent than the others but there were no significant differences between competency levels of other quotas. The competency score had no significant relationship with marriage and economic statuses of students as well as their entrance exam score.

Conclusion: responses to the students' self-reported preparedness described the general state of competency of the last year dental students as fairly satisfactory. However, the theoretical backgrounds related to some subjects need to be more emphasized.

Key words: COMPETENCY, DENTISTRY STUDENTS EDUCATION

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Introduction

Assessment of educational courses has critical impact on quality improvement in all curricula, therefore studies for assessment of educational outcomes and impacts have a high priority. Surveys aimed at alumni and

graduating students may be useful for the evaluation of program. Competency has been defined as the behavior expected of beginning independent practitioners. This behavior forms upon understanding, skills, and values in an integrated response to wide range of situations encountered in general professional practice.¹ This level of performance requires some degree of speed and accuracy consistent with patient well-being but not necessarily the highest possible performance. Besides, it needs an awareness of the integral parts of the acceptable performance and a tendency to self-improvement². The competency is the knowledge, skills, attitudes and values that

Corresponding author: Dr Pourabbas is an associate professor of dentistry of Tabriz University of Medical Sciences

Adress: education development center, Pishineh building, Daneshgah Ave, Tabriz, Iran

Tel:98 411 336 004 0914 115 6243

E-mai: rpourabbas@yahoo.com

must be demonstrated by a dental graduate during clinical practice³. The program should also make a statement about what is valued by the institution and makes the program publicly accountable for what the degree represents⁴. Additionally the competency statement creates the outline for the education and the direct of student assessment. These statements should be prepared as a dynamic document that is based on feedback from the outcomes of student assessment and program evaluation^{1, 2}. The general minimal requirements/competencies for dental graduates have been described by an association of Iranian educational development center and Iranian Board committee for Dentistry. A wide range of abilities from general issues (i.e. practice marketing, dental office management, data management, critical thinking, recording, medical ethics etc.) to very specific technical aspects of dental practice have been considered. In Defining of those requirements some previous studies⁵ and also local cultural and socio-economical status have been taken into account. Three dimensions of performance: knowledge and understanding; skill in application; and supportive values⁶ have been covered by that competency statements.

The aims of this study were to evaluate the competency of last year dental students in the major skills needed for a new dentist and to investigate their relationship with background factors such as age, gender, marriage status, quota of entrance to the university, entrance exam score and economic status as well as to determine impact of different learning resources and types of education on competency levels.

Materials and Methods

A total of 55 last year dental students from the dental faculty of the Tabriz University of Medical Sciences recruited in this study.

Self-reported preparedness evaluated by filling out questionnaires which were designed to assess the essential competency

of dental practitioners. Validity and reliability of the questionnaires were tested through a pilot study recruiting ten students (Males and females) and Cronbach's α were calculated to assess the reliability of the questionnaire. The questionnaires consist of two main parts: Part one including demographic information such as age, gender, marriage status, ranking of entrance exam and economic (mean income of the family) status. Part two addresses the major skills needed for a new dentist including five important groups which consist of 21 general and 132 special abilities. To evaluate the degree of these abilities self-administered questionnaire assay were used that could be rated on a four point Likert's scale from 1 (not at all competent) to 4 (very competent). By using of this formula the balanced score were accounted:

Balance Score = (sum of grade - number of questions) \times 100 / (max - min).

Data were processed using appropriate statistical soft ware. The "Pearson correlation coefficient" test was used to evaluate the relationship between age and entrance exam with competency. The student *t*-test was carried out in order to compare the competency among the genders and various status of marriage. The comparison of competency between different entrance quota and economic status were done using one way-ANOVA test.

Results

The total mean score of competency statements was 47.48 ± 2.03 out of 100. The lowest and highest scores were for oral diagnosis (%18.48) and oral health (%66.06), respectively. The overall competency levels of the various fields of dental practice are described in Table-1

The ratios of both male to female and single to married among the all of participants were 54.5 and 45.5 percent. The mean ages of respondents were 27.16 ± 5.38 years, ranging from 23 to 43 years old. Males were significantly more competent than females and the rate of competency has no significant

relationship with marriage status of students (Table-2).

Table1. Competency levels of different items which ranked from the highest to lowest (data expressed as the balance score of 100)

Field of Competency	Competency balanced score
Oral health	66.06±20.28
Pain /anxiety control	65.05±20.66
Oral examination	64.95±18.59
Professional ethics	62.69±18.5
Treatment planning	60.86±19.77
Restorative / prostodontic treatments	60.45±19.73
Endodontic treatment	58.93±17.48
Other fields	53.48±19.29
Oral Diagnosis	52.16±16.59
Information management and critical thinking	51.51±17.62
Dental clinic managing/ practice marketing	50.54±31.93
Oral surgery / drug prescription	47.87±20.81
Periodontal treatments	45.45±20.38
Public Communication	38.36±23.88
dental emergencies managements	34.54±26.29
staff training methodology	34.24±28.22
Controlling of Dental caries	33.18±11.5
Treatment of TMJ and malocclusion disorders	28.33±19.01
Orthodontic treatment	26.16±18.12
Oral disease diagnosis	18.48±9.58

The past dental hygiene students continued their education to the doctoral degree were more competent than the others ($p=0.001$) but there was no significant difference between competency levels of other quotas of entrance ($p=0.423$). (Table-3)

Level of competency has no significant relationship with economic status of students (table- 4)

Students' total competency score had a positive relationship with their age($r=0.571$). This study also revealed that the competencies are lower in the fields with high dependence on the theoretical background than the more practical fields. Of all students, 61.8 percent believed that getting other competencies such as business skills (accounting, insurance, practice marketing, equipment and supplies, banking, billing and payments), self confidence and patients' satisfaction, were necessary for dentists.

Discussion

Our study was conducted to evaluate the level of self- perceived competency of last year students from the dental faculty of the Tabriz University of Medical Sciences in the major skills needed for a new dentist. There are no previous studies assessing self-perceptions of dental competencies in Iran; however this method of data collecting has been considered as the most widely used method for dental competency evaluation^{7, 8} The mean overall students' competency score was at a moderate level. The results showed that the students felt most competent in preventive dentistry, managing patient's pain and anxiety, conducting an oral examination, professional ethics, restorative / prostodontic and endodontic treatments. In most of the other studies that have been investigated in deferent countries, the graduated students were mainly competent only in routine tasks.⁹ Graduates in the united state felt similarly most competent in the same areas in particular restorative and preventive dentistry^{6, 10}. Graduates from Australian¹¹, French^{12, 13} and UK^{14, 15} dental schools also felt well prepared for diagnosis and basic restorative dentistry, area, traditionally emphasized in dental curricula¹⁶. The fields such as oral diagnosis, orthodontic treatments, treatment of TMJ and malocclusion disorders and managing emergencies which the general dentists are rarely involved in, the competency scores

Table 2. Competency rates of the participants based on the gender and marriage status

Demographic variables		Competency (mean± SE)	<i>p</i> -value (<i>t</i> -test)
Gender	M.(n=30)	49.2±2.9	p<0.05
	F.(n=25)	39.7±2.3	
Marriage status	Married (n=25)	47.7±3.8	p>0.05
	Unmarried (n=30)	42.3±2.1	
Total		n=55	

Table 3. Competency rates of different quotas of entrance

Quotas of entrance	Competency (mean± SE)
#1 educational area † (n=23)	44.3±2.3
#2 educational area (n=13)	46.1±4.6
#3 educational area (n=3)	42.4±9.9
Quota of war and family of martyrs (n=6)	34.6±4.0
past dental hygiene students (n=10)	65.7±2.3
Total (n=55)	47.48±2.03

†) Geographical regions in Iran divided in to 3 educational areas based on the convenience /access to educational facilities: #1 educational area including the large cities have the highest educational conveniences and #3 educational areas have the lowest one

Table 4. Competency level of participants based on their economic status

Economic status of students	Competency level (mean± SE)
High (n=2)	30.6±6.7
Moderate (n=51)	47.6±2.1
Low(n=2)	60.7±1.2
Total (n=55)	47.48±2.03
Statistical analysis (ANOVA)	P=0.132

were relatively low. Students of this study felt least competent in select, obtain, and interpret clinical, radiographic, and other diagnostic information and procedure in oral disease, recognizing pathologic occlusion, managing medical emergencies, treatment of TMJ disorders, similar to the findings from the France¹², UK¹⁷, Norway¹⁸ and Canada¹⁹ graduates which felt poorly prepared in the areas of practice administration and managing emergencies. Graduates in the united state^{10, 20} also had lowest competent in the areas of practice administration, managing emergencies, treatment of TMJ disorder and

diagnose of the facial muscular pain. The level of competency is generally high in individually acquired experiences, such as observation, self learning and it is low in practices/fields depend on theoretical training, such as occlusion, orthodontic and periodontal treatments. These findings reveals in dental students as adult learners the self-learning methods could be very effective way to gather data and experience. On the other hand, it shows that students take less advantage of theoretical courses for using practical treatment.^{21, 22}

the past dental hygiene students were significantly higher than the other quotas of acceptance. It may be due to their relatively high confidences and previous training and experiences. In spite of some other surveys⁷, competency level of the students showed a significant difference between females and males. Although some researches indicated that women felt more competent in some fields representing problem- solving and critical thinking⁷ the other studies reported that the female students find issues of

academic and clinical work more stressful than do male students^{23,24}.

In this study, levels of competency had no significant relationship with economic and marriage status of the students; However no study in the dental education literature, to our knowledge, has attempted to identify the role of the economic and marriage status of the dental students in the rate of their competencies.

The present study revealed that in all fields of competency, most students had used both formal and informal training. According to these results, the main source of learning in most fields was theoretical training in the faculty. However some degrees of competencies obtained through observation of procedures from the classmates or post-graduate students.

Conclusion

In conclusion overall competencies mean score of last year dental students from the dental faculty of the Tabriz University of Medical Sciences was at a moderate level. However the self-perceptions competency in the fields that highly depend on the theoretical backgrounds e.g oral disease, orthodontic treatment, treatment of TMJ and malocclusion disorders, and emergency and dentistry management were lower than average.

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