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Comparative Evaluation of the Curricula for Dental Implants in Post-graduate Courses in Dental Faculties in Iran

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Abstract

Background and aims. Dental implant education is inevitable in dental educational programs of dental schools. The aim of the present study was to determine and evaluate the curricula and teaching methods for dental implants in specialty courses of periodontics, maxillofacial surgery and prosthodontics in Iran.

Materials and methods. In the present study, 6 dental faculties were evaluated. Data was collected through discussions in small groups with authorities, academic staff and post-graduate students. A special questionnaire was used for quantitative variables. Descriptive statistical methods (means, medians, and ranges) were used when necessary.

Results. All the dental faculties had dental implant educational programs in their curricula. However, the details were unspecified and the programs were presented differently in different faculties. A total of 82.3% of the academic staff of the departments involved participated in the programs. Lack of funds and facilities were reported as the most important factors limiting implant educational programs. Forty-five articles by the academic staff of dental faculties in Iran have been cited in Pubmed.

Conclusions. The details of dental implant educational programs are different in different dental faculties in Iran; however, the content of the programs are similar to a great degree.

Key words: **Dental implant, teaching method, specialty course programs.**

Introduction

Clinical instruction is the most important and fundamental part of medical education, without which educating skilled and efficient specialists is very difficult. Clinical instruction is a difficult process which is under the influence of various factors and variables. Therefore, research studies are absolutely necessary to maintain and promote the standards of education and supervision in medical training, which has its special complexities and characteristics so that diagnostic, therapeutic, educational, preventive and promotive skills can be fostered in

students. At present the use of implants to replace missing teeth is a predictable and commonly used treatment modality.[1] In industrialized countries (North America and Europe) dental implants have been incorporated into the dental education curricula for the past 30 years.[2] However, dental implant has been incorporated into dental education curriculum during the past 10 years in Iran, which is an indication that most dental practitioners who render dental implant treatments have learned the procedures through self-education, trial and error, participation in short-term programs offered and held by private companies or rarely by attending academic courses abroad. On the other hand, several studies have shown that implant education does not follow a uniform pattern in various educational centers in the United States,[3-5] Europe[6] and Britain and Ireland,[7] and several factors including budget, educational facilities, academic staff and motivation of authorities can influence the educational quality of implant courses.

In Iran the implant theoretical and practical educational programs have been incorporated into the curricula of some specialty post-graduate courses including periodontics, maxillofacial surgery, prosthodontics (and recently operative dentistry) based on the guidelines of the Ministry of Health, Treatment, and Medical Education; however, no studies to date have evaluated those educational programs from quantitative and qualitative viewpoints in various dental faculties throughout the country. Since revision of the content of the educational programs is top on the agenda of the Office for Specialized Dental Education Programs, the present study attempted to evaluate the implant educational programs from qualitative and quantitative viewpoints so that results might be useful in programming and revising dental education curricula in future.

The present study made an attempt to answer the questions whether there are any differences in dental implant educational programs between the various dental faculties throughout the country or not.

Materials and Methods

The present study lasted from October 2009 to October 2010. The subjects were dental faculties which included specialized dental implant courses in their curricula for post-graduate programs of periodontics, maxillofacial surgery and prosthodontics on the condition that students had completed at least 1 course of these programs. Therefore, sampling procedures were not carried out in the present study and all the dental faculties which volunteered to cooperate and present data were evaluated.

Preliminary evaluations indicated that Isfahan, Tabriz, Tehran, Shahid Beheshti, Shiraz, Mashhad and Hamadan dental faculties possessed the inclusion criteria. Therefore, permission was obtained from the Office for Specialized Dental Education Programs, Ministry of Health, Treatment, and Medical Education.

In order to make sure of the accuracy of filling of questionnaires the faculties were visited and the relevant authorities (faculty deans, heads of the departments, academic staff and post-graduate students) were interviewed in small groups and the questionnaires were filled in.

VAS (visual analogue scale) was used to evaluate the capabilities and satisfaction of the post-graduate students with the implant programs.

In the present study, a questionnaire, which consisted of 47 questions was used; the questionnaire had been previously used by other researchers.[6] However, before the main phase of the study, the questionnaire was evaluated by 4 academic staff in each department and tested in pilot fashion.

Statistical analysis

Means, medians and ranges were calculated by descriptive statistical methods and Kruskal-Wallis test was used to compare means.

Results

Of the 7 dental faculties under study (dental faculties of Isfahan, Tabriz, Tehran, Shahid Beheshti, Shiraz, Mashhad and Hamadan) 6 were visited, their facilities and educational atmospheres were evaluated, and small group discussions were held. Shiraz Dental Faculty was excluded from the study because of lack of cooperation.

All the dental faculties under study offered implant educational programs in their post-graduate courses of periodontics, maxillofacial surgery and prosthodontics in theoretical and practical (simultaneous) programs. Since the theoretical and practical implant courses were presented in other special courses of the relevant specialty courses and it was not possible to separate the theoretical or clinical hours that exclusively dealt with implant from other specialty lessons of these courses we did not manage to accurately calculate the number of hours that exclusively dealt with implant in the groups actively involved in dental implants.

The academic staff involved in implant education were predominantly from periodontics, maxillofacial surgery and prosthodontics departments and on aver-

age comprised 82.3% of the academic staff of those departments. This percentage comprised 100%, 85% and 62% of the academic staff of periodontics, maxillofacial surgery and prosthodontics departments, respectively.

There were no significant differences between the various dental faculties in this respect.

The academic staff involved in implant education had in turn learned the procedures through self-education and short-term courses offered by commercial companies in Iran or abroad (92%) and 8% had completed academic courses leading to gaining degrees on the subject.

None of post-graduate students could graduate from the dental faculties without completing implant courses, although there were no specific requirements and the completion of the courses depended on the number of the patients available and the personal interest and pursuit on behalf of the post-graduate student. No data was available on the total number of patients treated during the previous year or semester in any of the departments; however, data in this regard could be retrieved by referring to the archives of the faculties or the implant departments.

In the prosthodontic departments the number of laboratory hours for each implant was not known and the implant prosthetic treatments were rendered without any phantom models; rather, they were carried out directly on the patients. Regarding implant surgeries, phantom models were used in 4 dental faculties to instruct the post-graduate students (although this fact had not been recorded in their official curricula).

Use of educational films was not a prerequisite in any of the faculties, although they were optionally used as educational aids. All the films were non-original and had been supplied by commercial companies. (Original films are those which have been filmed and produced by the faculty itself.) In addition, use of distant learning network was not common in any of the faculties under study.

In 5 of the faculties, implant "case presentation" programs were carried out by the post-graduate students. The overall ratio of academic staff:post-graduate student in the faculties was 1:1.5 on average; the dental unit:post-graduate student ratio in implant surgery was 1:14 and 1:1.5 in prosthodontics. No significant differences were observed in these ratios between the faculties under study.

In 5 faculties there were special and specific centers for implant education, which were predominantly used for implant surgeries, receiving patients and other implant-related activities; however, prosthetic treatments were rendered in the prosthodontic departments. In addition, all the faculties had special patient files for implant treatments, which had been designed by the academic staff using textbooks and references in this regard but no uniform approach had been adopted among the faculties under study.

The most commonly used implant systems in the faculties under study were Nobel®, Friadent®, Implantum®, Biocare®, and ITI® systems but other systems, including Astra®, SPI® etc were also used sporadically.

Implant educational programs were presented to the maxillofacial surgery and periodontic post-graduate students on the second year and to the prosthodontic students on the third year in the majority of the faculties. The textbook used as a reference in all the faculties was "*Contemporary Implant Dentistry*" by Carl Misch. In addition, relevant chapters from other reference books were also used, which included *Clinical Periodontology* (Newman), *Periodontology and Implant Dentistry* (Lindhe), *Peterson's Principles of Oral and Maxillofacial Surgery* etc.

Regarding the number and frequency of different prosthetic treatment plans none of the faculties had any data available and access to such data involved access to and evaluation of patient files.

Advanced surgeries such as sinus lifting procedures were optionally presented to maxillofacial surgery and periodontic post-graduate students and the students were theoretically and practically evaluated at the end the course and marked.

A total of 45 articles on implants by the academic staff of the faculties had been published in journals indexed in Pubmed, with the greatest and lowest articles from Tehran (25) and Hamadan (no articles) Medical Sciences Universities, respectively (Figure 1).

The skills and capabilities of post-graduate students in implant treatment and their satisfaction with the implant educational programs are presented in

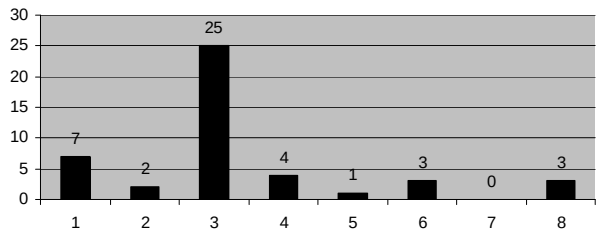

Figure 1. Number of ISI articles published by the academic staff of the dental faculties under study: 1, Isfahan; 2, Tabriz; 3, Tehran; 4, Shahid Beheshti; 5, Shiraz; 6, Mashhad; 7, Hamadan; 8, others.

Figures 2 and 3.

Discussion

During the past ten years implantology courses have been incorporated into the curricula of many dental faculties in Iran. This trend is not confined to Iran and is prevalent in the universities of many other countries. In the United States the number of dental schools offering implant courses has increased from 33% in 1974[3] to 89% in 1997.[8] In addition, 84% of dental schools in Europe offer these courses to their general course students.[6] There are reports that all the EU dental schools will incorporate implant courses into their official curricula in near future.[9,10] Therefore, Baritz's vision that implant education will be incorporated into all the dental education systems will materialize.[11]

In the present study, although the number of theoretical and practical implant education hours was impossible to calculate because they have been incorporated into other educational programs, different dental faculties had differences in the way in which they presented these courses, which has been demonstrated in other studies, too.[4,6]

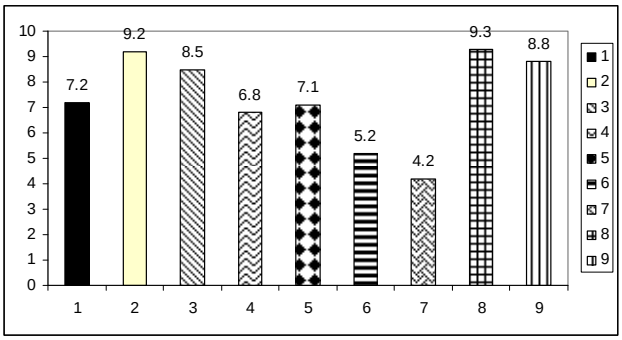

Figure 2. The skills and capabilities of post-graduate students in implant treatment: 1, theoretical knowledge; 2, communication with the patient; 3, taking patient history; 4, treatment plan presentation; 5, practical skills; 6, management of complications; 7, maintenance; 8, patient referral; 9, knowledge about references.

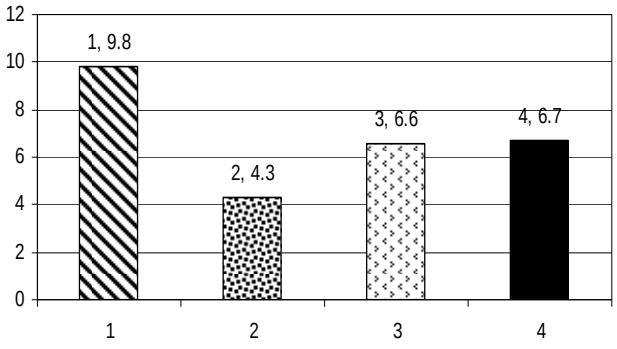

Figure 3. Post-graduate students' satisfaction with implant educational programs: 1, satisfaction with the academic staff; 2, satisfaction with the equipment; 3, satisfaction with the educational program; 4, harmony between the content and the needs.

Educational films, catalogs and other sources are mainly prepared by commercial companies and supplied to dental faculties, which is similar to the situation in 73% of EU dental schools.[6]

Use of educational models has a great role in implant education.[12] In addition, commercial companies have a great role in hands-on instruction. The role of Nobel Biocare, ITI and Paragon companies in offering such instructions is prominent in the dental schools in the United States, with no significant differences between them. On the whole, the extent of hands-on instructions has increased from 41% in 1995 to 75% in 2005,[4] which is consistent with the results of the present study.

The most commonly used implant systems in EU dental schools are Nobel Biocare® (15%) and ITI® (19%).[6] Although the exact percentage of the systems used was impossible to calculate in the present study, Implantum® and Friadent® systems were also commonly used in addition to the above-mentioned systems. Factors such as the quality of the services provided and the support by the local representatives of the company and price of the products were mentioned as the factors involved in selecting an implant system.

The results of the present study showed that advanced surgical techniques, such as sinus lifting procedures, were offered, albeit optionally, to maxillofacial surgery and periodontic post-graduate students. The same trend has been reported by other studies.[13,14]

The most important source for student dissatisfaction was lack of physical facilities and treatment equipment and tools, which was considered an important obstacle to learning by some post-graduate students, in a way that overshadowed other aspects of implant education. This source of dissatisfaction has been reported by other studies as a confounding factor in education[15] and professional capabilities and skills.[16]

The results of the present study indicated that 45 articles by the academic staff of the faculties under study have been indexed in Pubmed, which accounts for only 0.02% of articles on the subject; therefore, Iran has a conspicuously minor role in implant research.

Conclusion

Implant education is presented in periodontics, prosthodontics and maxillofacial surgery post-graduate courses in all the dental faculties under study; however, the quality and quantity of these educational programs are not uniform and the details are not specified in some cases. The most important educational challenge in this regard is the lack of proper educational and treatment facilities and equipment.

The quality and quantity of such instructions will be promoted by improving the facilities of dental faculties and by sharing lectures and seminars with other faculties on the web.

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