

Oral Implantology Education in the Dental Colleges of Pakistan



Farhan Raza Khan¹ BDS, MCPS, MSc, FCPS

Maham Muneeb Lone² BDS

ABSTRACT:

OBJECTIVES: To explore the status of Implantology teaching at the dental colleges in Pakistan and to assess the topics in Implant dentistry that is being overlooked in the present curriculum.

METHODOLOGY: A questionnaire was distributed to 50 dental faculty members in 20 dental institutions across Pakistan. Information on implant education methods, format of teaching and assessment was obtained. Data was analyzed using SPSS 19.0. Descriptive statistics were computed.

RESULTS: We received 33 completed forms; hence the response rate was 66%. In most institutions implantology education was introduced in the last 10 years. Twenty three respondents (out of 33) reported frequent implant placement in their institutions, only 17 (74%) reported that they allow students to observe implant surgeries. Lectures (64%) were the mainstay of teaching implantology at undergraduate institutions.

CONCLUSIONS: Oral Surgeons are primarily responsible for implant education at undergraduate level; hence the subject teaching is Surgery oriented. Implant education started in most institutions in last 5-10 years. Topics such as implant prosthetics, bone regeneration and grafting are poorly covered in the current curriculum.

KEYWORDS: Dental Implant; Education; Curriculum.

HOW TO CITE: Khan FR, Lone MM. Oral Implantology Education in the Dental Colleges of Pakistan. J Pak Dent Assoc 2016; 25(4): 137-42

Received: 16 October 2016, Accepted: 25 December 2016

INTRODUCTION

The use of dental implants to replace missing teeth in the partially dentate and edentulous arches has exponentially increased over the last decade¹. The demand of dental implants has grown in parallel to increased predictability of this treatment modality²⁻⁴. A systematic review conducted by Lang *et al.* reported 98% success rate of implants restorations⁵. Increase in the use of implants as a modality of dental replacement is evident by a survey conducted by the American Academy of Implant Dentistry. The results of the survey reported that almost three million people in the USA already have implants placed and this number is thought to increase at a rate of 500,000 per year⁶.

Although, no statistics are available on the dental implant market in Pakistan but dental professionals related to this field have observed a massive expansion in the demand and supply of implant dentistry in the major cities of Pakistan. This is probably due to an increased awareness and heightened expectations of patients for a fixed prosthesis that will last them a long time. As a result of this growth, it is inevitable that fresh dental graduates will encounter patients who would either want implant supported prosthesis or those who might require maintenance of implant supported restorations already placed by some other dentist⁷. Thus, dentists should be aware of all the theoretical and clinical aspects of implant dentistry technique and maintenance during their undergraduate education to better serve the patients once they have graduated^{8,9}.

On the flip side, the curriculum requirements for oral implantology set by Pakistan Medical and Dental Council (PMDC) for undergraduate students are very minimal. Oral Implantology is taught only as a part of other clinical

¹ Assistant Professor, Operative Dentistry, Aga Khan University, P.O. Box 3500, Stadium Road, Karachi 74800, Pakistan

² Resident, Operative Dentistry, Aga Khan University, Karachi, Pakistan

Corresponding author: "Dr. Farhan Raza Khan"

<farhan.raza@aku.edu >

specialties and very little, if any cognitive or psychomotor assessment is done on the subject in the undergraduate examinations. The contemporary curriculum has not outlined any requirements for minimum competency level at pre-clinical or clinical assessment regarding implant treatment planning, surgical placement or prosthetic rehabilitation curriculum. Therefore, the knowledge and skills in implant dentistry is either offered by commercial courses run by implant manufacturers or during post graduate residency training in academic institutions.

A number of surveys have been done in the USA, UK, Ireland and other European countries regarding implant dentistry education at the undergraduate level¹⁰⁻¹⁴. These studies noted that there is a lack of homogeneity in the implant education among dental school curricula. The reasons were mainly that (i) not all dental institutions consider implant dentistry of the same importance in an already overcrowded curriculum; (ii) not all schools have the necessary faculty or resources to involve students in hands-on clinical teaching or (iii) financial restraints do not allow for implant education and training. The Pakistani dental schools can learn from this and can be remodel the dental curriculum to impart better clinical skills related to implantology to a fresh dental graduate.

The aim of the present study was therefore to explore the status of implant dentistry teaching at various dental institutions in Pakistan and to outline the topics and areas in the implant dentistry curriculum that are being overlooked at the undergraduate education.

METHODOLOGY

A questionnaire was distributed to the faculty of Operative Dentistry, Prosthodontics, Oral Surgery and Periodontics in various dental institutions of Pakistan. The respondents were the teaching faculty of the above mentioned departments. The first part of the questionnaire included a covering letter, informed consent and demographics of the respondents. The second part of the questionnaire inquired about year of introduction of oral implantology education, department responsible for Implantology teaching and primary method of teaching Implantology at the undergraduate level. Information was sought regarding the level of student's exposure to Implantology in their undergraduate years. The questionnaire and consent form are attached in the annexure.

Data Analysis

Data were analyzed using SPSS version 19.0. Frequency distribution of categorical variables and descriptive statistics were computed.

RESULTS

Out of the 50 forms sent, 33 faculty members from different cities of Pakistan returned their forms, giving us a response rate of 66.0%. There were 28 males and 5 females among the study sample. The mean age of the respondents was 37.0 ± 7.7 years.

Most of the respondents (22 out of 33) were residency trained faculty belonging to various specialties of dentistry and were fellows of the Royal College of Surgeons in UK or fellows of the College of Physicians and Surgeons of Pakistan. Almost 50% of the respondents (16 out of 33) were employed as Assistant Professors in their respective institutions (Fig. 1). The rest of the participants were employed as Lecturer (n=6), Associate Professors (n=5) and full Professors (n=6).

Even though majority of the faculty members had done specialty training, only 14 (45%) of them reported that they had learned their skills of implantology during their postgraduate training. The rest 55% of respondents had gained the implantology proficiency at commercial courses run by various implant companies.

The department of Oral Surgery was reported to be predominantly responsible for implant dentistry teaching at the undergraduate level, followed by Prosthodontics, Operative Dentistry and Periodontics (Fig. 1). When questioned about implant placement at their institutions, 23 (70%) faculty members reported that implants are frequently placed at their institutions. Out of these, only 5 (22%) reported that they do not allow students to observe the implant surgeries.

Twenty seven (82%) teachers reported that implant education was introduced into their college curriculum in the last 10 years. Fig. 2 summarizes the primary method of teaching Implantology at colleges. It was observed that the primary mode of teaching Implantology is still didactic rather than hands on. The implant systems used in dental colleges of Pakistan are shown in Fig. 3.

The questionnaire included a list of topics related to implant dentistry to ascertain which topics were being taught in the curriculum. It was observed that topics related to the surgical component of implant dentistry were covered more at the undergraduate level which is consistent with the fact that Oral Surgery was the department primarily responsible for teaching Implantology. On the contrary, topics encompassing the prosthetic component of implant rehabilitation, bone regeneration and advanced procedures like sinus lift and bone grafting were ignored at more than 50% of the teaching facilities (Table 1).

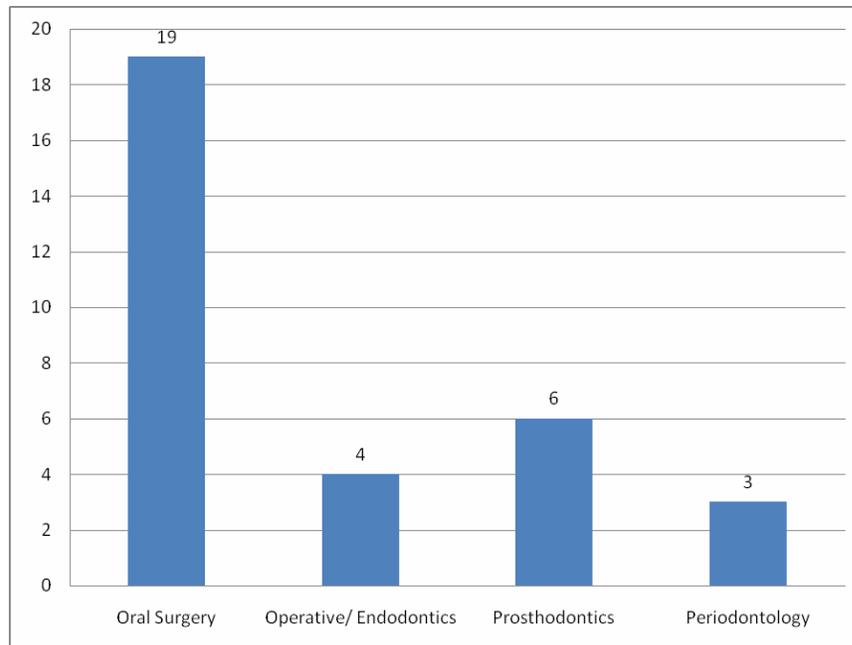


Fig. (1). Department responsible for teaching Implantology.

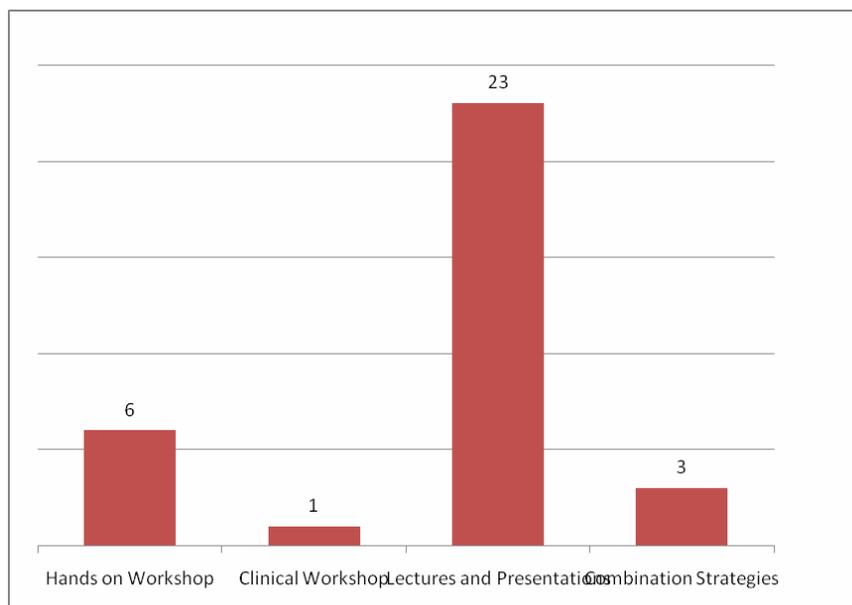


Fig. (2). Instruction methods for teaching dental implantology.

DISCUSSION

Although Dental Implantology is increasingly being practiced by general dental practitioners in Pakistan, but it is seen to be poorly taught to the undergraduate students¹⁵. This in part can be attributed to the curriculum set by the

PMDC. There are only a handful of topics related to implantology which are inculcated into the Oral Surgery and Prosthodontics syllabus to be taught to the final year students. The undergraduate student should have knowledge of replacement options for missing teeth; including the option of dental implants. It is alarming to note that

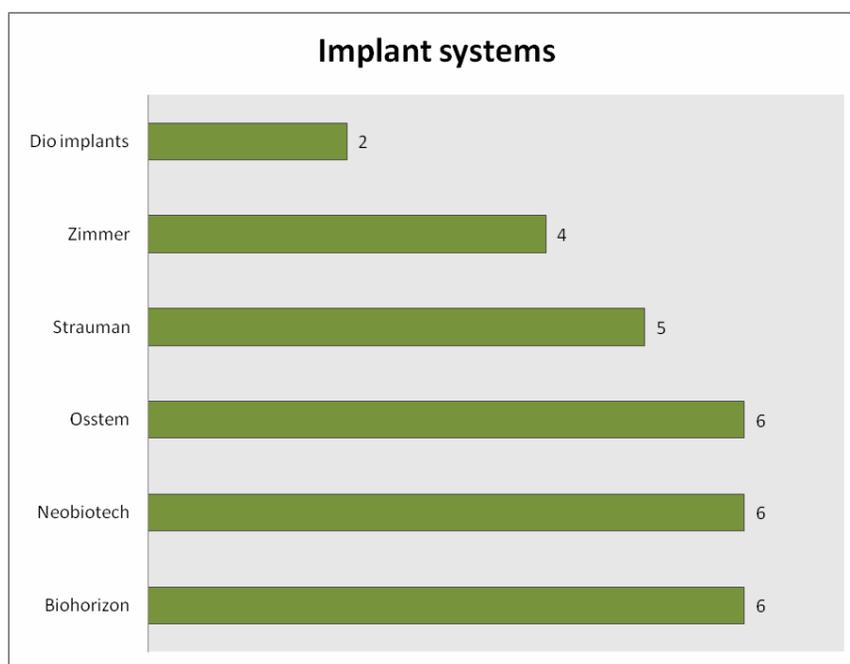


Fig. (3). Implant systems used in dental colleges of Pakistan.

Table 1- Implantology topics taught at the dental school level (n=33)-

Implantology topics taught to BDS students	Reported Yes (%)
Concept of Osseointegration	28 (85)
Classification and types of dental implants	24 (73)
Implant biomechanics/biomaterials	19 (58)
Implant surface treatment	21 (34)
Implant patient education	14 (42)
Dental pre-surgical assessment of the implant patient	22 (67)
Medical pre-surgical assessment of the implant patient	21 (64)
Radiographic evaluation of the implant patient	24 (73)
Treatment planning for an implant-supported bridge	15 (45)
Treatment planning for an implant-retained over-denture	15 (45)
Immediate implant loading	9 (27)
Screw-retained vs. cemented implant restoration	8 (24)
Occlusion in implant restorations	12 (36)
Craniofacial application of implants	5 (15)
Implant surgery	23 (70)
Implant post-surgical care	23 (70)
Implant surgical complications and management implant failure	16 (48)
Implant prosthetic complications and management	13 (40)
Current research and developments in dental implantology	14 (42)
Sinus lifts and bone grafting technique	14 (42)

*Bold font indicates that this topic is neglected in over 50% of institutions.

treatment planning of implant retained prosthesis was not being taught by 54% of the faculty members assigned to teach tooth restoration and replacement. Occlusion, surgical complications of implant placement and patient education pertaining to implant restorations was also observed as being neglected at more than 50% of the teaching facilities. When compared to international studies it was appreciated that in the UK and USA implantology education was primarily considered responsibility of Periodontics and Prosthodontics department. (7, 10) In comparison, implant education is more dependent on the department of Oral Surgery in undergraduate schools of Pakistan. As a result of this disparity, the study results showed that topics related to the prosthetic component of implant dentistry are not being taught to more than 50% of the undergraduate students. Implant dentistry should either be taught as a separate subject or be taught by a multidisciplinary approach with equitable input by faculty of Prosthodontics, Periodontics, Operative Dentistry and Oral Surgery¹⁶.

The results of the present survey found that implant education was introduced into the undergraduate curriculum in Pakistan during the last decade. This is in contrast to the UK, Europe and USA where teaching of implantology was incorporated into the curriculum of majority of dental schools as early as 1994¹⁰⁻¹². Although, classroom lectures are an essential tool for gaining primary knowledge of any subject, they do not provide sufficient competency to the students to carry out the procedures in an independent clinical setting. Implant placement is a skill that, like other dental procedures, has to be performed clinically for better understanding. Lim *et al.*¹⁰ in USA found that besides theoretical teaching, 78% students also did a laboratory course to gain hands on pre-clinical experience in Implantology. Koole *et al.*¹⁷ in a recent survey on implant education in European institutions reported that along with lectures by 93% faculty, 77% faculty also taught the skills of implantology with the help of hands on training. Blum⁷ and Addy¹¹ in their UK based surveys on similar topic, reported that along with the lectures, more than 50% students practiced on phantom heads or were given practical demonstrations on different aspects of implantology. On the other hand, the present study reported that only 20% respondents use pre-clinical or clinical instructional methods. Majority of the respondents (24 out of 33) reported theoretical teaching as the only instructional method in undergraduate implant education. Even though no institution allowed students to place implants, up to 55% of the respondents in the present study reported that they frequently allow students to observe an implant placement procedure. This is analogous to data reported in studies carried out in UK and USA where 70% and 60%

respondents respectively allowed students to observe an implant placement procedure^{7,10}.

The present study is the first to be carried out in Pakistan to assess the level of implant dentistry education at the undergraduate level. Dental colleges in major cities of Pakistan were covered to give baseline data on the current trends in implant education with in Pakistan. The shortcomings in implantology education can be attributed to the fact that this discipline is a relatively new one and not all dental educationists are trained in this field. However, dental implantology is evolving on a rapid pace. To prepare the students for effective and successful use of dental implants in independent clinical practice, amalgamation of theoretical knowledge base, pre-clinical and clinical training related to Implantology should be inculcated into the dental curriculum. There is a need to revise the curriculum to include and accentuate topics in the syllabus so that the students can learn the art of treatment planning, prosthetic phase of implant restoration, patient education regarding implant supported prosthesis, and recognize the case difficulty level so that they can offer appropriate referrals¹⁴.

The response of the survey is the reported practice and teaching pattern of the faculty who filled out the questionnaire with no measure to explore actual teaching practice. There is no data on the actual number of hours spent in the teaching and training of implantology. This would have provided us with a better idea as to which topics should be emphasized for better teaching of the dental students.

CONCLUSIONS

Within the limitations of the study it can be concluded that oral surgeons are the primary teaching faculty responsible for implant education at undergraduate level in Pakistan. Lectures, rather than hands on training, are the mainstay of teaching implantology. Concepts of implant prosthetics, occlusion, complications sinus elevation and bone grafting should be suitably incorporated in the present curriculum.

RECCOMENDATIONS

It may be appropriate for dental schools to consider the incorporation of hands-on elements and clinical observation of dental implant treatment in their undergraduate education so that the fresh graduate can provide better management of patients seeking the provision and maintenance of dental implants. With the newly suggested five year dental curriculum by PMDC and HEC, it's expected that implant education will get more emphasis in future.

ACKNOWLEDGEMENTS

The authors are grateful to Dr. Kiran Rehman, Dr. Syeda Mahvash Hussain, Dr. Rabia Ali and Dr. Samira Adnan for help in the collection of data from dental institutions.

DISCLOSURE

There are no conflicts of interest regarding the present study and publication of this paper.

REFERENCES

- Esposito M, Hirsch J-M, Lekholm U, Thomsen P. Biological factors contributing to failures of osseointegrated oral implants: (1) success criteria and epidemiology. *Eur J Oral Sci.* 1998; 106: 527–51.
- Khraisat A, Jebreen SE, Baqain ZH, Smadi L, Bakaeen L, Abu-Hammad O. Multicenter retrospective study of cement-retained implant-supported anterior partial prostheses: success and restoration evaluation. *Int J Oral Maxillofac Implants.* 2008; 23: 705-8.
- Cicciù M, Beretta M, Risitano G, Maiorana C. Cemented-retained vs screw-retained implant restorations: an investigation on 1939 dental implants. *Minerva Stomatologica.* 2008; 57: 167-79.
- Sherif S, Susarla SM, Hwang JW, Weber HP, Wright RF. Clinician- and patient-reported long-term evaluation of screw- and cement-retained implant restorations: a 5-year prospective study. *Clin Oral Investig.* 2011; 15: 993-9.
- Lang NP, Pun L, Lau KY, Li KY, Wong MC. A systematic review on survival and success rates of implants placed immediately into fresh extraction sockets after at least 1 year. *Clin Oral Implants Res.* 2012; 23 Suppl 5: 39-66.
- Moldovan S, Lyle DM. The Failing Implant: Reducing Risk- Addressing modifiable risk factors to help avoid complications. *Inside Dentistry* 2014; 10: 6.
- Blum IR, O'Sullivan DJ, Jagger DC. A survey of undergraduate education in dental implantology in UK dental schools. *Eur J Dent Educ.* 2008; 12: 204-7.
- Aljohani HA, AlGhamdi AST. Predoctoral dental implant education at King Abdulaziz University. *Saudi Dent J.* 2009; 21: 135–8.
- Lang NP, De Bruyn H. The rationale for the introduction of implant into the dental curriculum. *Eur J Dent Educ.* 2009; 13 (Suppl. 1): 18–23.
- Lim MVC, Afsharzaned Z, Rashedi B, Petropoulos VC. Pre-doctoral implant education in U.S. dental schools. *J Prosthodont.* 2005; 14: 46–56.
- Addy LD, Lynch CD, Locke M, Watts A, Gilmour AS. The teaching of implant dentistry in undergraduate dental schools in the United Kingdom and Ireland. *Br Dent J.* 2008; 205: 609-14.
- Afsharzaned Z, Lim MCV, Rashedi B, Petropoulos VC. Pre implant dentistry curriculum survey: European dental schools. *Eur J Dent Educ.* 2005; 9: 37–45
- Koole S, Vandeweghe S, Mattheos N, De Bruyn H. Implant dentistry education in Europe: 5 years after the Association for Dental Education in Europe consensus report. *Eur J Dent Educ.* 2014; 18 Suppl 1: 43–51.
- De Bruyn H, Koole S, Mattheos N, Lang NP. A survey on undergraduate implant dentistry education in Europe. *Eur J Dent Educ.* 2009; 13: 3-9.
- Ghani F, Moeen F. Incorporating implant dentistry into undergraduate dental curriculum: Need, problems & a simplified implementation strategy. *J Pak Dent Assoc.* 2011: 193-8.
- Atashrazm P, Vallaie N, Rahnema R, Ansari H, Shahab MP. Worldwide Predoctoral Dental Implant Curriculum Survey. *J Dent (Tehran).* 2011; 8: 12–8.
- Mattheos N, de Bruyn, Hultin M, Jepsen S, Klinge B, Koole S, Sanz M, Ucer C, Lang NP. Developing implant dentistry education in Europe: the continuum from undergraduate to postgraduate education and continuing professional development. *Eur J Dent Educ.* 2014; 18 Suppl 1: 3-10.