



## Implant Dentistry in the Predoctoral Dental Education Program at Dalhousie University. Part II: Patient evaluation

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### Abstract

A questionnaire was sent to subjects who had received treatment with implant-supported fixed or removable prostheses in the predoctoral implant program at Dalhousie University between 1994 and 2004. The questionnaire included 15 questions aimed at evaluating overall patient satisfaction, oral function, patient information, treatment costs and time line. A total of 83 active patients were identified from patient records and mailed the questionnaire. The response rate was 65%. High overall patient satisfaction rates were reported for all items regardless of type of implant treatment.

**Keywords:** Dental Implants; Questionnaire; Patient Satisfaction; Dental Education; Patient Evaluation; Dental Students

### Introduction

Initially, only specially trained dentists or specialists provided treatments with dental implants when rehabilitating partially and completely edentulous patients. However, following the clinical success of such treatments, dental schools and educators realized implant training should be included as part of the curriculum [1-6]. According to an international survey on predoctoral implant education, over 85% of the participating dental schools reported they had implemented implant dentistry in their curriculum [7]. Most dental schools in North America are today offering students courses and clinical training in dental implant therapy [4-6]. In the US, the Commission on Dental Accreditation (CODA) standards has announced they will mandate a competency in the replacement of missing teeth with fixed and removable dental implants [8]. There are several reports indicating successful clinical outcomes from such programs even though major differences with respect to type of treatments and student responsibility exist [9-12].

Although clinical outcomes from implant treatments performed by predoctoral students appear to be comparable with those reported from professional implant centers, information is sparse regarding patient evaluation and satisfaction [13,14]. Factors such as overall treatment time, patient management and financial aspects may influence an individual when considering becoming a patient in a dental school clinic. Moreover, from a didactic point of view it is important to evaluate and review patients' opinions regarding

their treatment in order to improve the implant training program quality and facilitate patient management procedures. In 1994, an elective program in implant dentistry was initiated at Dalhousie University, Faculty of Dentistry in Halifax, Nova Scotia, Canada. In a previous study [9], outcomes after treatment with dental implants between the years 1994 to 2004 were reported. In this second part, patients' opinions regarding the treatment were evaluated.

### Materials and Methods

Of the 95 subjects who had received treatment with dental implants at Dalhousie University, 83 (32 men and 51 women) were still registered as active patients and were available for the questionnaire study. A questionnaire, which included 15 questions related to the patient's implant treatment, was developed and sent to all who had received treatment with dental implants. A letter explaining the purpose of the study was also attached. The questionnaire was carefully designed and the questions were reviewed and evaluated by all investigators to make sure they were relevant and valid. The questions focused on overall satisfaction with the treatment, oral comfort, treatment costs, and aspects related to the surgical and restorative part of the treatment (Table 1). All questions had a Visual Analogue Scale (VAS) for responses ranging from a negative to affirmative response and the subjects were able to write a comment under each question. The VAS was later coded in 10 equidistant steps where a higher value indicated a more affirmative opinion. The Health Sciences Human Research Ethics Board at Dalhousie University approved the study.

**Statistical Methods**

Data were analyzed in frequency tables. Student’s t-test was used to analyze equality of means. All data analysis was done in SPSS.

**Results and Discussion**

Of the 83 questionnaires, 9 were returned due to incorrect address reducing the sample size to 74. Of those, 48 subjects (65%) returned the completed questionnaire. No further attempts to contact the non-responders were made. Among the respondents, 21 were men and 27 women with a mean age of 47.6 years (range 18 - 72 years). The distribution of implant treatments can be seen in table 1. Mean patient satisfaction scores ranged from 7.85 to 9.57, which indicates the vast majority of the patients was very satisfied with their treatment and reported major improvement

in oral function and esthetic appearance. The questions regarding the surgical and restorative procedures also showed high mean satisfaction scores and the overall majority reported they would consider choosing implant treatment again (Table 2). The number of internal non-responses was low and no significant differences were seen with respect to gender and type of implant treatment.

| Type of Treatment          | Gender       |                |
|----------------------------|--------------|----------------|
|                            | Men (n = 21) | Women (n = 27) |
| Single Implant Restoration | 12           | 15             |
| Multi-Unit Restoration     | 2            | 1              |
| Overdenture                | 7            | 11             |

**Table 1:** Distribution of gender and type of implant treatment (n = 48).

| Question  | Patient Satisfaction Score |   |   |   |   |   |   |    |   |    | Non-response | Mean Value |
|---|----------------------------|---|---|---|---|---|---|----|---|----|--------------|------------|
|   | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8  | 9 | 10 |              |            |
| 1. Overall, how satisfied are you with your implant treatment?  |                            |   |   | 1 | 1 |   | 2 | 10 | 8 | 26 |              | 9.06       |
| 2. Do you often think about the implant(s) as being something artificial in your mouth?   | 1                          | 1 | 2 |   | 1 | 2 | 4 | 5  | 4 | 28 |              | 8.54       |
| 3. How well do you chew your food, compared with before the implant treatment?  |                            |   |   | 2 | 5 | 5 | 3 | 1  | 6 | 24 | 2            | 8.39       |
| 4. How difficult is it to clean around your implant(s)?   | 1                          | 1 | 1 | 1 | 5 | 4 | 3 | 7  | 7 | 17 | 1            | 7.85       |
| 5. Are you satisfied with the esthetic result of your implant treatment?  |                            |   | 1 | 1 | 1 |   | 3 | 2  | 9 | 31 |              | 9.17       |
| 6. How would you describe the surgical procedure involved with placing the implant(s)?  | 3                          |   | 2 | 1 |   | 2 | 5 | 7  | 7 | 20 | 1            | 8.06       |
| 7. How would you describe the restorative procedures with fabricating the implant tooth/teeth?  | 1                          |   | 1 | 1 | 2 | 3 | 7 | 6  | 7 | 18 | 2            | 8.17       |
| 8. Did the student and faculty provide the care you received in a professional and satisfactory way?                                      |                            |   |   |   |   |   | 3 | 3  | 6 | 36 |              | 8.63       |
| 9. Were you given clear and appropriate information regarding the implant treatment as well as about other alternative treatment options? |                            |   |   |   |   |   | 4 | 3  | 5 | 36 |              | 8.44       |
| 10. Did you receive appropriate information about the cost of the treatment?  | 1                          |   |   |   |   |   | 1 | 4  | 8 | 34 |              | 9.42       |
| 11. What did you think about the time period you had to wait from being referred until you received an appointment for examination?       |                            |   | 2 | 2 | 3 |   | 5 | 5  | 4 | 26 | 1            | 8.51       |
| 12. Have your expectations about the treatment been fulfilled?  |                            |   |   |   | 1 | 1 | 2 | 6  | 9 | 28 | 1            | 9.23       |
| 13. Do you consider the fee you paid for your implant treatment reasonable?   |                            |   | 1 |   | 2 | 1 | 2 | 4  | 9 | 28 | 1            | 9.06       |
| 14. Would you choose the same treatment again if you had the option?  |                            |   |   |   |   | 1 | 2 | 2  | 6 | 35 | 2            | 9.57       |
| 15. Do you consider the time and money spent on the treatment worthwhile?   |                            |   |   |   | 1 | 1 | 3 | 3  | 5 | 33 | 2            | 9.37       |

**Table 2:** Distribution of responses to the questionnaire questions, with scores ranging from 1 (low satisfaction/negative opinion) to 10 (high satisfaction/ affirmative opinion).

Although there are several reports on the clinical outcome of implant treatments performed by predoctoral students, few have focused on factors related to patient satisfaction [13,14].

The results from this study showed an overall high patient satisfaction rate and correspond with findings in two similar studies [13,14]. Question (#14) "would you choose the same treatment again if you had the option?" showed the highest mean value (9.57). This corresponds to findings in a similar study where 95% responded they would undergo the same treatment again [13]. The item with the lowest mean value (7.85) was related to oral hygiene (#4). Of the sample in the present study, 37% were edentulous and received treatment with mandibular implant overdenture treatment in combination with a new upper denture. The protocol at Dalhousie includes 2 implants placed in the interforamina area connected with a gold bar and retentive clips in the denture base acrylic. Since most of these edentulous patients were older, some may have had issues with cleaning underneath the alveolar bar, which could explain the somewhat lower satisfaction scores for that specific item. In another study using a telephone survey to evaluating patient satisfaction after treatment with implant crowns, 86% reported they found it easy or very easy to keep the implant crowns clean [14].

The high patient satisfaction rate is comparable with findings in a study performed among subjects treated by specialists in oral surgery and experienced restorative dentists in private dental practices. In that study high satisfaction rates regarding esthetics, oral comfort and function among 48 subjects who had received treatment with single implant restorations [15].

Even though the results are very positive, this study has a number of limitations. The response rate was 65% and those not responding may have held a different and less affirmative opinion compared with the respondents. A higher response rate would have provided a more conclusive result. In addition, the fact that the sample included subjects who had different types of treatment could skew the results. It is difficult to know how edentulous subjects receiving implant overdenture treatment evaluated their treatment compared with those who had single implant restorations. However, no significant difference related to type of implant treatment was seen.

Differences among the students regarding level of skills and how they managed patient care may also have an impact on patient satisfaction. Furthermore, it is not known if surgical/technical complications during the treatment may have influenced the patient's opinion.

There were several comments both positive and negative added to the questionnaire responses. The negative comments were mainly related to the length of time needed to complete the restorative phase of the treatment (#7), and difficulties cleaning around the implants (#4), while the questions related to chewing ability (#3), information about the treatment and costs (#9) and the way the treatment was provided (#8) received many positive comments. The comments indicate the importance of proper hygiene instructions and scheduling of recall visits to ensure their patients are able to maintain good home care.

The questions selected for this questionnaire study were related to factors that could be of interest when evaluating implant treatment outcomes among patients in a dental school clinic. Implant treatments are expensive and take a long time to complete, especially in dental school setting where students need to have every procedure evaluated and approved by faculty. Also the fact that implant treatments include a surgical as well as restorative part with close collaboration between the entities makes it important to evaluate how patients experienced such arrangement. Extended treatment time may cause frustration among patients and therefore it is important to try and identify factors that could be improved to reduce such frustrations. Patient information is another important factor and it is essential that students also learn how to properly inform their patients about costs, timeline and all procedures to avoid conflicts. The VAS was used since it does not direct the response into pre-designed category, but allows for a more individual evaluation, which can later be coded and measured.

Patient evaluation provides valuable feedback to not only the predoctoral dental students, but such information is also important for the course director and other faculty involved in the implant program. Patient comments about their treatment and how they experienced the surgical and restorative phases may result in changes in the programs to better streamline patient care and reduce the length of time needed for completing treatments. It is not unusual that there is a delay in patient care when senior students are graduating and need to refer their patients to less experienced junior students for completion of the treatment. In such situations, it is important that faculty/instructors be involved to make sure the transition is done in a proper way to minimize further delay in patient care.

Even though the vast majority of North American Dental Schools today offer programs in dental implants, there is a huge variety regarding the clinical training students receive in restoring implants. In a previous study only about half of the schools offered their predoctoral students such experience [4]. The fact that predoctoral dental students in the elective implant program at Dalhousie University are able to perform treatments with fixed and removable prosthodontics will provide them with a broad experience within the field of implant dentistry, which will be beneficial in their future professional career. There is evidence students who have participated in elective implant programs are more inclined to offer and provide implant prosthodontics in their offices compared with those who had not participated in such programs [11,16].

Even though it is difficult to recruit suitable patients for the predoctoral clinic, students at Dalhousie are able to restore single implants both in the posterior and anterior area. Moreover, students are also able to manage and restore cases with short-span multi-unit fixed implant prostheses as well mandibular implant overdentures. However, the lower fees offered in the dental school clinics is critical in the recruitment of new patients.

## Conclusion

Results from the questionnaire showed high level of patient satisfaction regardless of type of implant treatment. This indicates that the predoctoral implant program at Dalhousie University has been successful and students have been able to provide implant therapy in a manner which patients have found satisfactory.

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